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Net Neutrality

Exploring views of internet stakeholders in Sweden

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Abstract:

The purpose of this thesis is to examine the views of internet stakeholders in Sweden, from the perspective of net neutrality. There does not exist one single definition of the principle, which makes defining net neutrality in the context of this thesis important. The basic concept of net neutrality is that all similar internet content should be treated equally. However there are several technical, economical and legal aspects to consider, and that makes an exploration of those aspects a part of our background. What peaked our interest was the combination of the high profile in the debate, complex topic and the result of a small survey we conducted that showed a low level of awareness.

In this qualitative study, eight different respondents answered our questions, coming from three major categories of stakeholders (ISPs, CPs, and legal authorities). The analysis was based on interpretations of the answers and fitting them into a theoretical framework constructed by the authors to compare the views of the respondents.

The reported views on net neutrality contains a wide range of concerns covering several disciplines. There is a mix of past, present and future concerns being lifted, with both technical, economical and legal aspects. The depth of the answers vary from shallow to very complex. To be able to comment on the findings we state our view of net neutrality as a starting point for our discussion.

We found that the delicate and complex topic, high profile in the debates, and ongoing legal changes has led to a low response rate. From the responses received, the view of the stakeholders are more homogenous among ISPs, and more varied among CPs. The respondents are pro net neutrality, more so from a theoretical perspective. The legal authorities has a pragmatic view and provided us with a deeper understanding. It would provide further insights to see how the view of the stakeholders might change when the guidelines from BEREC are presented in the late summer of 2016.

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Abbreviations

Technical and related abbreviations are very common in the field of net neutrality. We have summarized the abbreviations used in this report below for easy reference.

BEREC – Body of European Regulators of Electronic Communication. The regulating agency of the telecommunication market in the EU.

CBUI - Coalition of Broadband Users and Innovators

CP – Content Provider

DPI – Deep Packet Inspection

FCC - Federal Communications Commission

ISP – Internet Service Provider

NRA – National Regulatory Authority

OSI model – Conceptual seven layer model for computer communication

OTT – Over-the-top content. Delivery of media over the internet where the ISP is not in control of the content, but from a third-party like Netflix (video) or WhatsApp (messaging).

PTS – Swedish Post and Telecom Authority

QoS – Quality of Service

1 Introduction

The topic of net neutrality is currently high profile both in the international and Swedish debate, and at the same time something that the average user is not that familiar with. In April of 2016 one of Sweden's largest Internet Service Providers (ISP) launched a zero-rating deal, offering a few selected free social media platforms, in particular Facebook. The deal is not the only one of its kind (Goldberg, 2015), but it is the one that has gotten most media attention, even internationally been cited as creating an outrage (Fortune, 2016; SVT, 2016; Westerholm, 2016). This current status of net neutrality, and the fact that there is a low level of awareness of the topic, as showed by a small survey we conducted in April 2016(Appendix A.3), peaked our interest.

Net neutrality involves some of the world's largest companies, has been a recent topic of debate among lawmakers in both the EU, US, and Asia (BBC, 2016; European Commission, 2016; FCC, 2015). It is a topic that concerns almost everyone, yet it is a subject that not all end users will be knowledgeable about because of its complex nature (Read, 2012). The idea of net neutrality is simply put that all similar internet content should be treated equally, and move at the same speed over the network, which in other words means that the providers should not discriminate any data traffic (Hart 2011; Njoroge et al., 2013). The interaction between the ISPs and content providers' (CPs) are particularly interesting, since net neutrality plays a major role in that interaction as well as affecting the end user experience (Njoroge et al., 2013).

The term net neutrality was popularized in 2003 (Wu, 2003) but the topics related to it has existed for a far longer period. The change in classification of internet transmissions in the US by the Federal Communications Commission (FCC) in 2005 (Njoroge et al., 2013) from "telecommunication services" to "information services" was another key event that spurred the debate, since ISPs were no longer bound by the non-discrimination policies in the telecommunication industry. There were also a split in both the political sphere as well as between technology corporations, leading to a major telecommunications bill failing in 2006 (Hart, 2011). In similar ways the debate in the European Union has also lead to the adoption of regulatory frameworks that aim to strive for net neutrality, and says that it is a topic of high importance. Being such a complex topic it is felt that these regulations might not be up to speed in all areas (Read, 2012).

At the international stage, there has been much criticism of large corporations like Facebook and Google that has launched their respective "free internet"-services, mostly in markets in the developing world of Asia and Africa. Facebook Zero launched in 2010, and later Internet.org that changed into Facebook Free Basics. Google has their own similar program called Free Zone. These are all services that provide a walled gardens internet without any monthly fees. It has not been well received in all areas though, as advocates of net neutrality has accused the programs of creating a two-tiered internet with a walled garden experience for the poor (Reisinger, 2016). The net neutrality debate has proven to be very much real since the ban of Facebook's Free Basics internet service in India as of February 8 2016, with the motivation from the authorities in India being that "No service provider shall offer or charge discriminatory tariffs for data services on the basis of content" (Access Now, 2016; BBC, 2016; Reisinger, 2016).

With the latest revisions in the EU's electronic communications' framework and the US's Open Internet rules (set by the FCC) made in 2015, both entities claims that net neutrality is an important issue and that they have very far-reaching regulation that will ensure the open status of the internet (European Commission, 2016; FCC, 2015). Despite those claims, there is still a hot debate internationally with topics like Facebook Free Basics, but also more locally in Sweden with zero-rating offers from large ISPs like Telia and Tre for access to social media or music services (Telia, 2016; Tre, 2016), that are debated and criticized of breaking net neutrality rules as well as being investigated by the authorities (Goldberg, 2015; PTS, 2016a), and it has been seen as a first step on a dangerous path (SVT, 2016).

1.1 Why net neutrality is important

As an exercise to say why net neutrality is important, we can construct a worst case scenario to paint a picture of what might happen if no regulation will take place. The situation described could be similar to that what is today on cable TV, where only some content is available on the provider you have chosen (Read, 2012). In such a case a CP A (Google) might do a deal with only ISP A (Telia), but not ISP B (Bahnhof). Not only will CP A not be available on ISB B, but such a deal might be exclusive meaning that CP B (Bing) might be blocked on ISP A. A continuation of this kind of deals will include most CPs, online stores like Amazon and eBay, streaming services like YouTube, Netflix, chat services like WhatsApp, Skype and so on. With the situation just described, a startup company would have to negotiate with ISPs not only in the country starting up, but with ISPs all over the world. We would probably never have had companies like Google or Facebook, and the argument is that it does hinder innovation and startups (Read, 2012).

The debate both internationally, that includes some of the world's largest organizations like Google and Facebook, and the debate from a Swedish perspective with zero-rating offerings being heavily criticized, the topic of net neutrality is of high concern and complex in nature with several aspects including technical, economical, and legal, as well as a wide range of stakeholders. The combination of the current debate, new regulation and a low awareness of the topic is what makes it important, and the complexity makes it interesting to study further (BBC, 2016; Goldberg, 2015; SVT, 2016).

1.2 Research Problem

Involving some of the world's largest companies, lawmakers in all parts of the world including the EU, US, and India, and outlining the development of how we see and use the internet, the topic of net neutrality involved a large array of stakeholders of various nature. The main stakeholders are ISPs, CPs, and the stage can be said to be set by the regulators, which in a Swedish context is PTS (Swedish Post and Telecom Authority), that in turn are receiving directives from the European Union that they have to implement.

The dimensions of net neutrality are many, where technical development has been used both for positive and negative net neutrality (Marsden, 2010). A large number of challenges are reported in the area of net neutrality, where blocking and throttling, privacy issues, lack of transparency and network congestion are major areas (European Commission, 2015). There are new ways to test the rules of net neutrality reported regularly (BBC, 2016; SVT, 2016, Westerholm, 2016) and the future of the open internet is at stake. This has led to this thesis to have a further look into the situation in Sweden today, where the view on net neutrality of major stakeholders is of particular interest.

1.3 Research Question

Based on the presented research problem, our main research question is:

Q: How does internet stakeholders in Sweden view net neutrality?

Furthermore we plan to answer the following question, which also will be a part of the answer to our main research question:

- *In what way has the adoption of the new net neutrality regulation in the European Union changed the stakeholders' attitude on net neutrality?*

1.4 Purpose

The overall purpose is to examine the views of internet stakeholders in Sweden, from the perspective of net neutrality. Since there are different interpretations of what the principle of net neutrality is, exploration of this potential gray area is of particular interest. To get the current view from a range of stakeholders, like ISPs, CPs, and legislative authorities will further deepen the insights in this thesis and provide a broader picture of the issue.

1.5 Scope

The focus is on the situation in Sweden, but that will be set in contrast to topics discussed in the international debate, for our purpose European and somewhat US policy are of special interest. The debate on net neutrality is also an interdisciplinary topic that has major economical, technical and legal implications, and it might not be a clear cut where these disciplines begin or end. We will have our point of departure in the field of informatics.

1.6 Structure of the thesis

The thesis will be organized according to the model presented below, to provide an overview of the thesis. It was inspired by a structure suggested by Maxwell (2005). We will start with a short introduction to the topic and present the research question in chapter one. In chapter two we will go deeper into the concept of net neutrality and adjacent areas of research, and based on the previous literature we will in chapter three establish a theoretical framework. In chapter four we explain our method of research, and our findings are presented in chapter five. In chapter six we form a discussion based on our findings in chapter five as well as the theoretical framework that we constructed in chapter three. The thesis is then concluded in chapter seven.

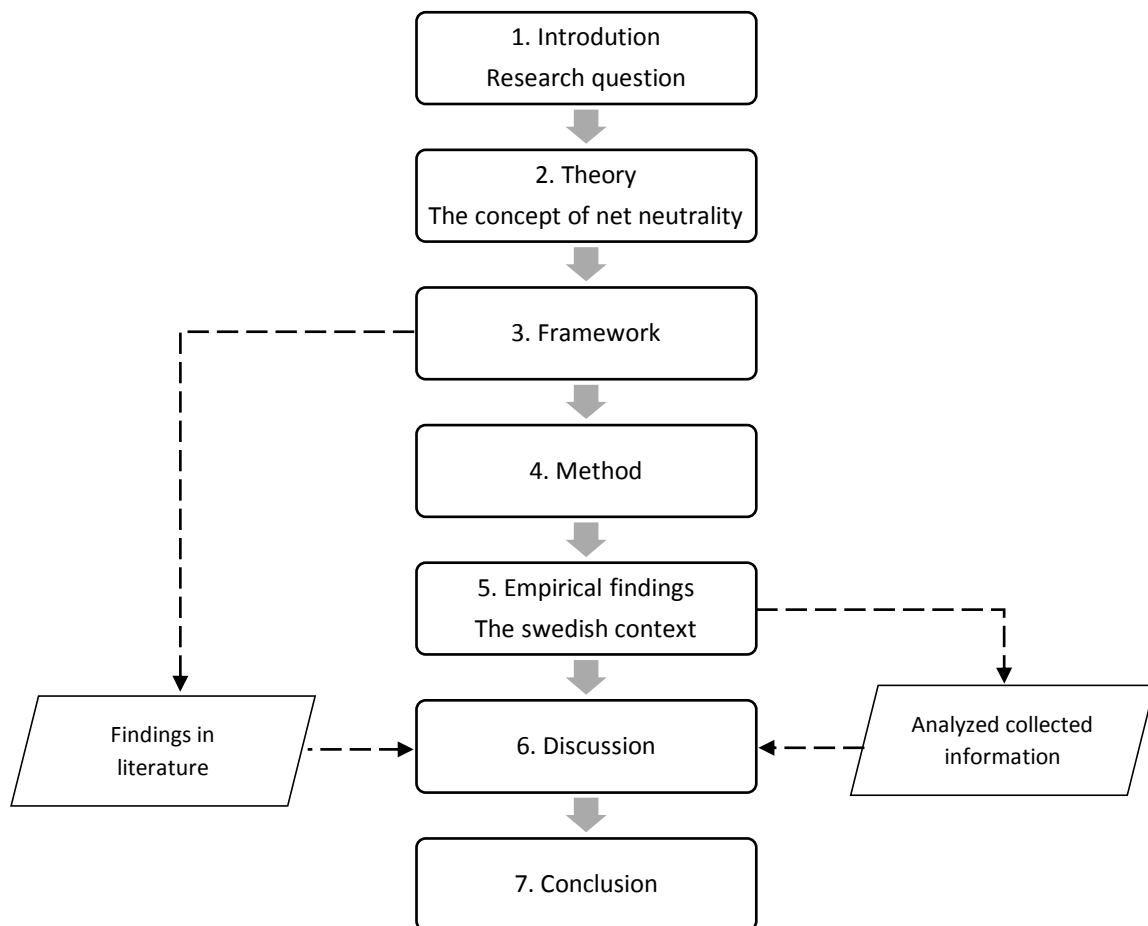


Fig 1.1. The structure of the thesis.

2 Background

2.1 History

The term net neutrality was popularized in an essay written in 2002 by Tim Wu and published in 2003 (Wu, 2003) but the context related to it has existed for a far longer period. In this chapter we will introduce definitions, models and concepts related to net neutrality. They often predate the term net neutrality, but the concept has always been there. A few events has fueled the debate on net neutrality, such as in 2002 when a coalition of tech companies called the Coalition of Broadband Users and Innovators (CBUI), including companies like Amazon, eBay, Yahoo, Disney and Microsoft, sent a letter to the Federal Communications Commission (FCC), using the phrase “net neutrality” to refer to the idea presented by Tim Wu, demanding the adoption of non-discriminatory safeguards to guarantee net neutrality (Hart, 2011).

The change in classification of internet transmissions in the US by the FCC in 2005 (Njoroge et al., 2013) from “telecommunication services” to “information services” was another key event that spurred the debate, since ISPs where no longer bound by the non-discrimination policies in the telecommunication industry. There were also a split in both the political sphere as well as between technology corporations, leading to a major telecommunications bill failing in 2006 (Hart, 2011). There has been more regulations adopted by the FCC at later stages as, to keep up with the many challenges of net neutrality (Jordan, 2011), where the latest rules for the open internet where adopted on February 26, 2015, which included a reclassification to “telecommunications services” as well as handling the latest *fast lanes* issue (FCC, 2015; Summers, 2015).

In similar ways the debate in the European Union has also lead to the adoption of regulatory frameworks that aim to strive for net neutrality, and declares that it is a topic of high importance. Being a complex topic it is considered that these regulations might not be up to speed in all areas (Read, 2012). Nevertheless, work is constantly being done and the most recent iteration of net neutrality law was decided on in 2015 and is being implemented in Sweden on 30th of April 2016 (European Commission, 2016; PTS, 2016a).

2.2 Stakeholders described

Central to this essay is the concept of an ISP and CP, as well as legal authorities. All these terms do themselves need some explanation and definitions as well, since it may not be obvious what is meant.

Internet Service Providers

To access the internet you have several options today, from a Swedish context the most commonly available ways are presented in the table below, categorized per technical method. The two main categories are by wire (fiber, cable, xDSL, VDSL) or by wireless (3G, 4G).

Table 2.1. Technical options for internet access in Sweden (PTS, 2016b).

Method	Connection	Population Reach
Fiber	Wired	59%
Cable	Wired	35%
xDSL	Wired	98%
VDSL	Wired	22%
3G	Wireless	100%
4G (LTE)	Wireless	100%

Table 2.1 illustrates coverage in terms of population reach, not geographical reach. There are some uninhabited areas that are not reached by any service. The most basic role of the ISP is to convey data between a CP and the end user. To do so, an ISP can be the only link from the end user out to the greater internet, or it can be a part of a chain, for example a smaller ISP might not own the entire chain, or maybe not any hardware at all. In those cases there will be some form of upstream ISP in the background (Read, 2012). From the perspective of this thesis, there will be no differentiation between different levels of ISPs, but we assume that the ISPs have the ability to discriminate content. At a very basic level, an ISP will offer a certain connection quality and speed, and provide that service for a fee (Njoroge, 2013). Table 2.2 shows at what speed the coverage mentioned above are available.

Table 2.2. Connection speeds available in Sweden (PTS, 2016b).

Speed	Population Reach
No access	0%
1 Mbit/s or more	100%
3 Mbit/s or more	100%
10 Mbit/s or more	100%
30 Mbit/s or more	87%
100 Mbit/s or more	67%

Content Providers

A CP on the other hand, is someone that initiate or receive signals, but do not convey them. Such content might be a music streaming service, video on demand, or teleconferencing, just to give a few examples. An ISP may produce content as well, and that is in such case viewed

as a separate part of the ISPs business and is separated from conveying traffic as the main role of the ISP. What type of content is being sent can vary a lot, but as long as you are initiating content, be that streaming services, online stores or applications, you are a CP from the point of this thesis (Read, 2012). The content provider typically makes its profit from advertisement or subscription services, and benefits from reaching as many end users as possible, and also by delivering as high quality content as possible (Njoroge, 2013).

Legal authorities

In Sweden the legal authority in the net neutrality field is PTS, which among other tasks has the authority to implement the legal frameworks concerning net neutrality. PTS directives coming from the European Union, and the latest revision was conducted in 2015, and that has been implemented by 30 April 2016. There will also be guidelines prepared from BEREC, a regulating agency, for how those rules should be interpreted, presented after the summer of 2016, and PTS, just as the other NRAs (National Regulatory Agencies), will act with consideration of these new guidelines (Appendix A.2; PTS, 2016a).

2.3 Technical aspects and concepts

There are a variety of technical definitions, terms and concepts related to net neutrality, as we will explain in this part. They are not ordered alphabetically, but instead in an order that is logical to explaining their adherence to the topic of net neutrality. Just as the term *net neutrality* also often is referred to as *open internet*, several of the headings below can also have related definitions meaning the same thing. We will cover that in the description where applicable. The purpose of this section is to highlight some of the complexity of net neutrality and to give the reader a deeper understanding of the technical and related concepts. This section can be used as a reference when reading the thesis if one is not familiar with the terminology, or want to get a deeper understanding of the issues discussed.

Table 2.3. Overview of technical aspects and concepts.

Net neutrality	
Packet switching	
End-to-end principle	
Quality of Service	
Over-provisioning	Deep packet inspection
Traffic shaping	Fast lanes
Net neutrality in wireless networks	
Zero-rating	
Walled garden	
Positive and negative net neutrality	

Net neutrality

The principle of net neutrality (also referred to as internet neutrality or open internet) is not defined in exact terms, but the basic idea is that all similar internet content should be treated the same, and move at the same speed over the network, which simply means that the providers should not discriminate (Hart, 2011; Njoroge et al., 2013). We will keep this term on a more overall or general level, as we will define terms and principles that is a part of the net neutrality principle in more detail, and based on that define a framework in the next chapter. As we have seen going through the literature, there is some variety of what one might include in the principle of net neutrality.

Packet switching

Not a core concept of net neutrality itself, but important for the further understanding of our discussion. If not stated otherwise, the network traffic we are assuming here is based on packet switching, meaning that digital communication is grouped into suitably sized chunks of data, called *packets*, which are sent over a network independently, and via different routes, and that are assembled in the right order at the end node. Each packet will have a *header* and a *payload*, something that we will come back to later. The header will indicate what type of content the packet contains, and the payload is the actual data (Hart, 2011).

End-to-end principle

A classical design principle in computer networking that states that in a general-purpose network, like the internet, there is a long list of possible applications that will compete over the network, and that the platform should remain neutral so that the application specific functionality should reside at the two ends of a network, as that is the only places that they can “completely and correctly be implemented” (Saltzer et al., 1984). There is an efficiency argument as well, as the cost is much lower to obtain reliability at a certain margin at the end nodes in a distributed network, rather than in intermediary nodes, which are often beyond the control of the end users anyway (Baran, 1964). The concept of a *Dumb pipe* is closely related to the end-to-end principle, since the argument that the intelligence should be placed at the end nodes is the same as to say that the part between the end nodes should be dumb (Hart, 2011). In reality today packets being sent over the internet is not treated equally, where e.g. streaming applications are prioritized, which has rendered the end-to-end principle more of a theoretical concept (Hart, 2011). This leads us into the next definition - Quality of Service.

Quality of Service

This is a term often heard in the discussion of net neutrality, and it is an overall concept of the quality, or performance, of a computer network, often viewed from the end users perspective. The idea is simple - to provide an adequate user experience, but how that is achieved depends on the context. A certain application might need a level of throughput, latency, bit error rate etc. to live up to the expectations, and this is a measure to achieve that. The tables presented in this section highlights aspects related to Quality of Service (QoS).

Table 2.4. Quality dimensions of data traffic.

Low throughput
Dropped packages
Errors
Latency
Jitter
Out-of-order delivery

Applications requiring a certain level of QoS are referred to as *inelastic*, typically requiring a minimum bit rate or a maximum latency to function properly. This could be streaming services, real-time applications like videoconferencing, IP telephony, online gaming or industrial applications like remote surgery or other real-time control of machinery (European Union, 2015). The literature has traditionally focused mainly on wired networks, but recently articles has begun to focus more and more on wireless networks (WLAN or 3G/4G). What is true for wired also holds up for wireless, but it adds further complexity, especially if a device is moving, meaning that it needs to switch connection to new cell (base station) in a wireless network. We will touch specifically on wireless networks later in this chapter. To achieve the level of desired QoS there are a number of available mechanisms, commonly used ones are presented in the table below, and are explained under separate headings (Jordan, 2010).

Table 2.5. Mechanisms to achieve desired QoS.

Over-provisioning	“Dumb pipe”-style network with high capacity
Deep packet inspection	Looking at the payload to determine priority level
Traffic shaping	Optimizing use of available bandwidth
Fast lanes	CP paying for their service to achieve extra prioritization

Depending on one’s viewpoint of what net neutrality is, the issues topic of QoS might raise different levels of concern. For some, the fact that traffic is prioritized is enough to violate the principles of net neutrality, to others it might be acceptable that traffic is prioritized based on content type, but not by content provider (Read, 2012). We will comment for our viewpoint in the discussion.

Over-provisioning

If you want to adhere to the end-to-end principle, or to have a “dumb pipe” style of network, and still have problems with QoS related issues, you can simply add better or more hardware. Congestion can be fought with increasing connections, bandwidth, switching or processing power, reliability with more routes and redundant hardware. Intelligence should in this style of thinking be added to the end nodes. With over-provisioning a core network provides higher capacity than the end nodes are capable of, then there will be no need to do e.g. deep packet inspection, at least not for performance purposes (Isenberg, 1998).

Deep packet inspection

In the beginning of this chapter we explained what a packet switched network was, and that each packet sent, e.g. traffic over the internet, has a header and a payload. Deep packet inspection (DPI) can be performed in many ways, e.g. via port mirroring, but the common goal is to inspect the payload, or data part, of a packet. Depending on what is found in the packet, it can be classified and redirected, tagged, blocked, limited or reported. The purpose of DPI inspections are many, and most of them are in the scope of net neutrality (Marsden, 2010).

DPI has a purpose in the legal context, as it might be required by lawmakers to have the ability to intercept transmissions, or that it might be required by law that the ISP filter content, typically content that are illegal in that country. From an economical point of view it is also a way for an ISP to provide a tiered service, where they can charge per service, per application, etc., and in that way tailor its offering. While not the main focus of our thesis, it is not a clear cut where one discipline starts or ends, and we will briefly comment on those nearby areas in the end of this chapter (Marsden, 2010).

Coming back to the core of net neutrality, discriminating or prioritizing traffic, DPI is clearly of major interest, since you could argue that its main purpose is to do just that. It could be used to improve QoS, where bandwidth capacity during peak hours might be a problem, or improve latency for live video or audio, but also for throttling connection speeds or blocking certain content. A major reason for ISPs to monitor traffic will be that the method described in the previous part, over-provisioning, is a very costly method to reach a high level of QoS, so a method like DPI will allow an ISP to have less capacity and still meet expectations (Marsden 2010; Read 2012).

Traffic shaping

The typical way ISPs use traffic shaping is to divide the capacity of a physical access link into smaller links as their subscribers have contracts for, e.g. splitting a 10 Gbps link into multiple 100 Mbps connections. What it does is delaying packets in a data stream to match them to a desired traffic profile, that for an end user typically is a certain speed of the connection, and to meet a certain level of QoS. To meet this expected QoS it is needed to know what information is being sent on some level, so that e.g. streaming services or VoIP are prioritized over file transfers. This is particularly important for wireless ISPs, and we get into more detail for wireless in the next part. A goal for an ISP is to use the available capacity in its network as efficiently as possible, and that is the overall goal of traffic shaping. It might be difficult to break down the traffic to one subscriber in full detail, as to shape traffic it is best to look on a small number of packages, but in contrast it is difficult to manage individual connections in short bursts. Since traffic to a connection can be complex, with parallel streaming and file transfers, optimal traffic shaping is something that will be improved with more advanced methods (Kim, 2014).

Fast lanes

Fast lanes is when speed to a specific service gets positively throttled if it is paid extra for by the CP. ISPs has in the past tried to launch specific services where video streaming services was given those fast lanes, if a company was willing to pay for it. Netflix has tried this in the US where they have paid ISPs to make their service run more smoothly. This kind of fast lanes is also referred to as *paid prioritization* and has been subject to recent net neutrality laws in both the US and EU, where the European Policies is felt to be less restrictive against fast lanes at the moment (Kaur, 2015; Summers, 2015).

Net neutrality in wireless networks

The case of net neutrality in wireless networks are becoming more and more relevant. Arguments has been made to separate wireless networks from wired ones (Jordan, 2011), since they operate partially under separate technical conditions. There are the same basic principles in wireless networks, but on top of that special challenges in terms of attenuation and interference, which is typically greater than in wired networks. This will in term require resource control to make the most of the available frequencies, power output and time in a wireless environment. The difference form wired networks is greatest at the network layer of the OSI model and below, and there is a greater acceptance to allow stronger forms of traffic management in wireless networks, but only at the network layer and below, denoted *internet infrastructure services* (Jordan, 2011) In some markets in the world a wireless option might be the only available option, and there might also be a lack of competition. For the scope of this thesis, there is a variety of connection type's available, as well as reported healthy competition (Appendix A.1; PTS, 2016b).

Zero-rating

The idea of zero-rating is that you don't have to pay for certain traffic. This usually applies to mobile data plans where the current norm is that you have a monthly limit, which will vary depending on your contract or ISP. The ISP may then offer you that some service or content will not count towards the monthly data limit. This phenomenon has been observed to exist from ISPs lately (Telia, 2016; Tre, 2016, Westerholm, 2016).

Zero-rating does indeed not discriminate traffic in ways that it is throttling speed or blocking any content, but at the same time all alike content is not treated equally, but rather at an economical level instead of at a technological level. As no clear definition of net neutrality exists, it makes it even more difficult when it comes what to include or not. If ones view of net neutrality is that it should not distort the playing field for applications or to interfere with the users choices being made, then zero-rating should be included in the debate and as a violation of net neutrality, as it affects the users' choice by making some options more attractive than others (Schewick, 2015). There has been seen similarities to the debate on fast lanes, as zero-rating usually involves some kind of payment and that this will harm innovation and competition. An ISP might also offer its own streaming service, which would make the situation even more complex. The latest rules from EU does acknowledge the issue of zero-rating (European Commission, 2015b) but has at the same time been criticized of being too weak (Kaur, 2015).

Walled garden

A closed system in where a provider has control over what content or applications are allowed, and restricts access outside this walled garden. The concept is also referred to as a closed platform or closed ecosystem, and one example in the field of net neutrality is the free internet services offered by Facebook or Google, where they control what content is available (Reisinger, 2016) In a full-fledged walled garden model, the there is no content but that the ISP selects (Njoroge, 2013), but in practice there might be different levels of access to reach outside the closed system.

Positive and negative net neutrality

Based on the methods to achieve or violate the principles of net neutrality, and as a summary of the definitions we have adopted two viewpoints presented by Marsden (2010) that differentiate the debate by two general directions, the first being *positive net neutrality*, where the focus lies on delivering a better service. Better would typically mean a faster, more reliable or guaranteed service. The opposite being *negative net neutrality*, where the focus lies on blocking or throttling (intentionally slowing down of internet service) content in some way (Marsden, 2010; Read, 2012).

2.4 Net neutrality from other perspectives

The concept of net neutrality is wide and it is not clear under what academic discipline it is to be categorized at all times. We have come into contact with several economical and legal viewpoints, and we will summarize the core thoughts relevant to our thesis.

2.4.1 Economical

There is two sides of the economic debate regarding net neutrality. One side wants to keep the net open and free and the other part wants the companies to be able to pay the ISP for using their bandwidth. The advocates for net neutrality says that it is the way the internet is built today that has been its successes. It is because all the users have the same ability and the same rights to use the internet (Hahn & Wallsten, 2006).

If the ISP will start to charge content providers for their use of bandwidth, there will possibly be a decrease in innovation, because money that would have gone to the developers will now go to the ISP. Another problem will be that there will be fewer new content providers on the market because of how the ISP will potential set their pricing, and it will simply be too expensive for new entries into the market (Hahn & Wallsten, 2006; Larson, 2015). On the other hand there will always be companies that are willing to pay for faster and more reliable speed on the internet. Hahn & Wallsten gives us an example of if the net neutrality policy is upheld the hospitals would not be able to pay for a fast track on the internet and thus slowing down the growing market of E-health, healthcare supported by electronic processes and communication. The conclusion is that at the moment there is no way of knowing what will be the best model for the future of internet development (Hahn & Wallsten, 2006).

Another look at net neutrality from an economical perspective is provided by Njoroge (2013) that conducts a formal economic analysis where investment incentives from ISPs, CPs participation and social welfare are calculated under different scenarios of net neutrality rules. The different scenarios are where *walled gardens* and *fast lanes* alternatives are available, as well as under neutral and non-neutral network regimes. The conclusion is that social welfare could be superior in a non-neutral environment, but that they could not draw any general conclusion as the social welfare was dependant on the balance between increased revenues from CPs and the reduced participation of CPs due to the higher pricing.

To summarize the economical perspective of net neutrality is that it is very difficult to predict how a non-neutral and a neutral environment will affect the pricing and innovation of related products.

2.4.2 Legal

We have already touched upon legal frameworks several times, as it is impossible to discuss net neutrality without them. In this part we will summarize the legal setting and general trends to set the legal stage for the net neutrality debate. There are two legal entities of particular concern for the scope of this thesis, which is the European Union in Europe and the FCC in the US. They are the legal entities that regulate the area of net neutrality and they have over the

past decade updated the laws concerning net neutrality several times, trying to clarify, improve, but also to follow the technical development and trends in the area.

For the European Union net neutrality is regulated through a number of directives. Directives are legislative acts that outsets a goal that each country in the union must achieve, however it is up to each country to devise the laws to reach those goals. The European Commission's broad policy is that it is of high importance to preserve the open and neutral internet (Read, 2012). The official term from the EU is *Open Internet*, but the terms network neutrality and net neutrality are also used. It is regulated in The Electronic Communications Framework and the topics in this framework includes choice, transparency, QoS and e-privacy (European Commission, 2016). The most recent changes were made in 2015 that is just about to be implemented as this thesis is being written in the spring of 2016 are new additions in form of banning of roaming charges and more pragmatic net neutrality rules. The more pragmatic way was a ban of fast lanes and a ban of blocking and throttling, with the exception of "specialized services of higher quality", to leave room for specialized applications. There are rules kept to allow network security and monitoring of illegal activities, and that will require some level of traffic management and packet inspection. While the rules are a step in the right direction, they have been criticized as being too broad and leaving doors open to e.g. zero-rating and the fast lanes rules as being too general to be effective, even if concern about zero-rating is reported to be in the pipeline legally (Kaur, 2015; Summers, 2015). There are also concern about the possibilities for traffic control, as an ISP are allowed to throttle speed of a specific kind, e.g. live video, which wouldn't be discrimination of content per se, but how a specific service is to be classified, and thereby prioritized, can be decided by the ISP. Throttling could also be done when a congestion is impeding, but there is also is criticized to be a too loose definition and might be used whenever it will fit the ISPs wishes (Kaur, 2015; Summers, 2015).

While our scope is Sweden and the EU regulation is of most interest, the regulation in the US are influential and the EU and US regulation have much in common. The latest revision of net neutrality rules in the US is from 2015 and its purpose is to "protect free expression and innovation on the internet and promote investment in the nation's broadband networks" (FCC, 2015). Similar to the rules in Europe the focus is on no blocking, no throttling and no paid prioritization (fast lanes).

3 Literature Review

A theoretical framework will be constructed based on selected articles, and we start with a literature review where the articles are summarized. The articles might have their base in different disciplines, such as technical, economical, and legal. The purpose of such a framework is to deepen the knowledge of the subject matter, and to guide the researcher in his or her work (Maxwell, 2005). We will use the framework in our discussion to categorize our empirical findings.

The literature found in the field of net neutrality takes a variety of perspectives, and being a subject in constant change of regulation, exploration of legal loopholes, and change in public opinion, we still have tried to get a broad perspective on the topic to be able to approach our findings with open mind. We have a variety of pragmatic and theoretical sources, as well as a view on the recent developments in legal frameworks that set the stage for the current debate. The principle of net neutrality is a very wide area, covering several academic disciplines. We will here summarize a range of articles on which we will base our analysis and discussion.

(Hahn and Wallsten, 2006) argue that if there will be an regulation of the internet in favour of net neutrality it would harm the investment incentives, slow down innovation and in the long run not benefit the end-users. Their approach to regulation of the internet is from an economic perspective and they believe that regulation in the lines of net neutrality theories would go against "sound economic management of the internet", and therefore argue that the government should not regulate the internet in accordance to net neutrality, but instead remove barriers that inhibits development of internet service technologies. They acknowledge that some form of regulation would be necessary, but that the best approach is a hands off strategy where the market is allowed to evolve in its own way, and to regulate only if necessary.

(Hart, 2011) has done an ambitious overview of the debate in USA, and although it at the time of this thesis it is five years old, since it is so thorough it still provides us with a great insight in the debate up to that point, and while it has in depth argumentation from both political and technical perspectives, it is detailed in its description of technical aspects such as end-to-end architecture, deep packet inspection and other QoS-related aspects. Conclusions are mostly relevant to the US debate, but the mechanisms forming the discussion are just as relevant to our thesis.

(Jordan, 2011) focuses on the sub-topic of net neutrality in wireless networks and what special implications that brings, compared to the traditional wired networks. The wireless networks often requires stronger traffic management, but only at the network layer and below. There are examples of how QoS can be achieved without violating net neutrality, and a wireless network should not be an excuse to over-manage network traffic, or to break the principles of net neutrality.

(Marsden, 2010) has an extensive book on net neutrality, where he on 300 pages goes through the topic from a technical perspective with an extensive background, and he adopts the end-to-end principle where no discrimination is made as a view of net neutrality, but also realizes that it is more of a normative nature. He then goes deeper into technical aspects such as Deep Packet

Inspection, where it on one hand is a legal requirement for the ISPs to be able to monitor traffic for law enforcement and security purposes, but also that it opens up for commercial applications once the equipment to facilitate DPI is in place. After the technical aspects are completed with walled gardens and quality of service aspects, the second half of the book focuses on regulatory issues and leading to a point of view that light touch regulation would be the best, where transparency and monitoring is key to be able to intervene where it is needed. He also makes the distinction between backward (negative) and forwards (positive) net neutrality, where negative concerns blocking, throttling etc., and where positive has focus on improved QoS.

(Njoroge et al., 2013) conducts a formal economic evaluation, where they develop a game-theoretic model in which ISPs and CPs investment incentives are explored under both neutral and non-neutral network regimes, and social welfare are measured. Their finding is that ISPs investment incentives are higher in non-neutral regime, because they can easier extract revenue from CPs then. The trade-off is that higher pricing might reduce CP participation, and which of these effects that is dominant will determine the outcome. Social welfare in this model is calculated as consumer surplus and CP profits, and that the division of this surplus needs to be controlled in some way through policies.

(Read, 2012) has a European perspective, but also conducts a more general introduction to the topic of net neutrality, and establishes an end-to-end or dumb network as the basis for a neutral internet, that he now believes has been challenged. The article provides the reader with a good overview of the history of net neutrality, particularly from a European perspective. He provides us with a hypothetical case to illustrate the importance of net neutrality, and also establishes a division of positive and negative net neutrality, similar to Marsden (2010).

(Schewick, 2015) provides a very extensive article on the topic of net neutrality and QoS, and goes into great detail on a number of related topics. She establishes a framework for evaluating net neutrality rules, and then an exhaustive list of scenarios are presented, and a general recommendation on what a non-discriminating rule best would look like is made. The proposed option is to ban application-specific discrimination, but to allow application-agnostic discrimination, meaning that pricing models based on speed would be fine, but that would be all. This view has very much in common with the end-to-end principle.

(Shin, 2014) has made a case study comparing the US with Korea, seen from the context of net neutrality, and more particularly debates among stakeholders and regulation from a pragmatic perspective. It highlights that net neutrality is a living area that has been in constant change over the last decade, making an analysis difficult since full implications of the past may not yet have been seen, or to make predictions for the future since similar situations are not found elsewhere. The conclusion is that competition is the key to a healthy internet environment.

(Tardiff, 2015) examines the FCCs regulations from February 2015. The author is reviewing the FCCs main arguments for and against introducing any new form of price regulations for the ISPs. The FCCs regulations is to protect the current quality of internet service. Tardiff's view is that putting price regulations on the ISPs is too excessive and would likely inhibit new development and have a negative effect on the current state of market competition. He writes that a large amount of ISPs will be enough to ensure the QoS is kept on the current level.

3.1 Theoretical framework

The topic of net neutrality is wide and covers several perspectives or disciplines. We have made a categorization of the topics covered in the literature review in the table below, based on the three major areas of (1) **technical**, (2) **economical**, and (3) **legal** aspects. Some sources might be a part of several disciplines, but here we have tried to find the core perspectives from each source, and for what its main interest is from the point of this thesis. Some topics, like the principles of net neutrality is as we have stated before of a more theoretical nature, and then we can accept older sources, compared to e.g. legal perspectives that might have changed more recently.

	Technical	Economical	Legal
Theoretical ↑ ↓ Pragmatic	End-to-end principle	Game Theory	
	Dumb Pipe	<i>Njoroge (2013)</i>	Regulation
	Over-provisioning		
	<i>Marsden (2010)</i>	<i>Hahn & Wallsten (2006)</i>	<i>Schewick (2015)</i>
	<i>Hart (2011)</i>	Investment	
	Quality of Service	Innovation	Policy
	Traffic Management	<i>Tardiff (2015)</i>	
	<i>Read (2012)</i>		
	<i>Jordan (2011)</i>		Strategy
	Deep Packet Inspection	Pricing Model	
	Throttling	Fast Lanes	
	Blocking	Walled Garden	
		Zero-rating	<i>Shin (2014)</i>
		Guidelines	

Fig. 3.1. Theoretical framework including literature review articles.

A paper like Hart (2011) has provided us with a deeper knowledge of the technical aspects of net neutrality, but it also covers the legal debate in the US. For the purpose of this thesis it is then placed as a technical article, since that part is of most interest to us. Almost all articles will touch upon more than one subject, but the categorization in the framework is based on the purpose of this thesis.

As pointed out by Maxwell (2005) it is important to remember that this is just a selection of prior theory and research, and it is one way to bring light onto a subject matter, that is suitable for the topic of net neutrality. The framework has to be used with that in mind, and it is not always possible to put the view of a researcher or stakeholder perfectly into a single category, which is something we keep in mind when applying the framework to the empirical findings.

4 Method

The findings were collected through several email questionnaires and through two telephone interviews (Appendix A.1; Appendix A.2). In the initial contact the chosen recipients in each organisation were given a brief written statement on the topic of the thesis and if they or anyone else in the organisation was able to answer a few questions about net neutrality. They were given the choice of how they would prefer to answer the questions, either by written answer or a telephone interview. Dahmström (2011) writes that it can be of special important to let the respondents have a choice on how to answer the questions when dealing with corporations. The first contact email was sent out to 26 organisations. The total number of answers, including both interviews and email responses is 8, which gave us a response rate of 31 percent. The report also takes in the view of an expert from PTS. The telephone interviews was recorded with verbal consent from the participants.

4.1 Sources

The articles used in this thesis is selected to give the reader a wider and deeper understanding of the problem and to show different aspects of Net Neutrality issue. Articles are found through LUBsearch, a service from Lund University Libraries that is the single entry point to all the libraries' joint resources. Complimentary searches was made on Google Scholar. We have focused on more recent articles, based on the nature of the topic, but allowed some technical articles of older age. The empirical data used were collected through email questionnaires and telephone interviews.

4.2 Selection of participants

Dahmström (2011) describes two ways of selecting participants for a study, random selection and non-random selections of participants. The participants in this study were selected non-randomly, Dahmström (2011) calls it “quota sampling”. It is when the researcher selects participants that fit the inclusion criteria, presented below.

The participants that were selected for initial contact were based on their position on the Swedish market and our belief of their importance for the thesis.

Inclusion criteria's were:

- Operate on the Swedish market.
- Deliver internet or content to end-user on the Swedish market.

4.2.1 Overview of responses from stakeholders

Table 4.1. Contacted ISPs.

Contacted ISP	No answer	Answered questions by email	Answered questions by telephone interview
AllTele	X		
Bredband2	X		
Bredbandsbolaget	X		
ComHem			X (14 min)
Comviq	X		
GlocalNet	X		
Halebop	X		
Hallon	X		
Net1	X		
Teletek	X		
T3	X		
Tele2		X	
Telia		X	
Tre	X		

Table 4.2. Contacted content providers.

Contacted CP	No answer	Answered questions by email	Answered questions by telephone interview
HBO Nordic	X		
ViaPlay		X	
Magine	X		
Cmore	X		
SFAnytime		X	
Netflix	X		
TV4		X	
SVT		X	
TV Folket	X		
Spotify	X		
Facebook	X		

Table 4.3. Contacted legal authorities.

Contacted Legal	No answer	Answered questions by email	Answered questions by telephone interview
PTS			X (37 min)

4.3 Choice of method

The starting point of any thesis is a research question or area that the researchers want to enlighten (Dahmström, 2011). This thesis is based on a qualitative data collection, and that method was chosen because it fits the relative uncertainty that surrounded the research question. Jacobsen (2002) describes it as an open method of collecting data, that will give the researcher nuanced data. A qualitative method is best suited to use when the researcher wants to create clarity in a phenomenon or concept. The qualitative research method is intended to find out how people understand and apprehend a given situation (Jacobsen, 2002). The qualitative way of collecting data is flexible, and it can give the researcher time to change the research question as the data collection proceeds. *“The starting-point is that we have a research question that we want to get illuminated. But this research question can change as we learn more”* (Jacobsen, 2002, p.142).

Esaiasson, et al. (2010) describes the way to gather information through respondents as they become witnesses or “truthsayers” and should bring information on how the reality looks inside the research area. This is a view we found very useful during our discussion on which questions to ask. We wanted the most honest “picture” of the problem as we possibly could get. A citation that sums our view very well is *“The various participants can very well grant different pieces to the often complicated puzzle”* (Esaiasson, et al., 2010, p.258).

4.3.1 Questions

The questions that was asked was open questions. A qualitative study needs longer and broader questions for enabling the analysis. Dahlgren, Emmelin and Winkvist (2004) calls this kind of questions for open-ended questions. Open-ended questions allows the respondent to answer in their own way and with their own words. Dahlgren, Emmelin and Winkvist (2004). The questions we asked are listed in appendix A.1.

4.3.2 Email responses

The initial persons that were targeted was the organisations PR-responsible. We got mostly three kind of responses. Either they did not answer at all, or they past the questions along inside the organisations to a more suited person, or the PR representative choose to answer the questions themselves. If there were no response within in a week, the same email was sent again as a reminder.

4.3.3 Interview

Teorell and Svensson (2007) writes that an interview can be conducted in a variety of ways. One way is where the interviewer has a set sheet of question with no or a little room for other questions or input from the respondent, while another way is to conduct the interview in a less structured manner with few planned questions, but also let the respondents’ answers provide the interview with new follow up questions. A third way described is that the interview is totally unstructured and that it is the respondent that steers the interview with minimal or no interference from the interviewer.

We conducted our two interviews by the two methods described first by Teorell and Svensson (2007). The interview with PTS was a semi-structured interview, where we had planned a set of questions, but was also relying on the answers we would get to bring us deeper and more specific follow up questions. The second interview we conducted with Comhem, this interview was structured and we had all the questions we would ask prepared beforehand. Comhem is an ISP, so to be as true to the study as possible we asked Comhem the same questions as we were sending out to other respondents through email.

4.3.4 Survey

The internet survey was conducted by using Google Forms. The form was shared on different social media platforms, was encouraged to share, and generated 145 responses. The results is not used in our empirical findings, but is used in the introduction to give a general picture of net neutrality awareness.

4.3.5 Analysis

We used Maxwell's (2005) thoughts as a base when analysing the answers and transcripts. Maxwell (2005) describes three analytical options: memos, categorizing strategies, and connecting strategies. We have read the transcripts and answers, taken out the essential information and applied the answers (categorizing) on to our theoretical framework as Maxwell (2005) suggests.

4.4 Trustworthiness

Dahlgren, Emmelin and Winkvist (2004), Esaiasson, et al. (2010) and Jacobsen (2002) brings up the importance of good internal and external validity. Internal validity is, in short, lack of bias and external validity is a measure of how good the research result can be applied on other situations or demographics. Maxwell (2005) is of the opinion that reliability is that if the same question was asked twice it should result in the same answer. That should be true for quantitative study, but will not be in a qualitative study. As Dahlgren, Emmelin and Winkvist (2004, p52) states: *"In qualitative research, the issue of being able to repeat the same data collection activity with similar outcome is absurd"*. The constantly changing rules, regulations and opinions makes this study a current look at the situation. Maxwell (2005) also rises a concern for how important it is that the researchers try not to influence the questions or interviews. In this paper we have included all the questions that has been ask and all the answers that was given, so that the reader has the possibility to draw their own conclusions. Dahlgren, Emmelin and Winkvist (2004) writes that small qualitative studies will never be able to represent a whole demographic and that is not the importance of studies like this. The authors continues to say that qualitative studies aims for an analytical generalization.

4.4.1 Ethical aspects

The participants name or position will not be mentioned, as it could reveal their identity, which is of no purpose to our study. All the participants have taken part in this study by their own free will. The participants that answered the questions by email gave their consent for us to use the answers in our study. In the two interviews that were conducted the participant was asked if we could record and transcribe the interview and that it will be used in the study. In both cases the participant said yes. The important of correctness in these kind of telephone interviews are high, and we have chosen to include both. The interview participants were also given the chance to look at the transcriptions to correct any misunderstandings and to give their acceptance of the interview material (Appendix A.2). These ethical aspects was done in accordance to the methodological literature (Jacobsen, 2002; Teorell and Svensson, 2007).

4.5 Method reflection

We believe that we have chosen a suitable research method for studying the topic of net neutrality and with our research question in mind, with the motivation earlier in this chapter. To have chosen to perform a quantitative study would have been difficult, since it has its strengths in quantifiable data that are easier measured in numbers, and that is something that would be difficult to extract via interviews. A quantitative method would be better for a larger selection of respondents with quantifiable data, and that would not allow for in depth analysis.

Jacobsen (2002) writes that a negative aspect of performing a qualitative study is that the data being is collected is multifaceted and will be difficult to categorize in a good way. We have asked all the email recipients the same question and they have answered the questions in a variety of ways, but they are at least somewhat comparable since they have the same starting point. The answerers varied in both length and depth. Here we would have had a benefit by only doing telephone interviews, as that would have given us a chance to get more informative answers where we felt it was needed, but at the same time we believe that the subject matter is sensitive to comment on, especially with the ongoing debate (Fortune, 2016; SVT, 2016) and that view was also confirmed in one of our interviews (Appendix A.2)

Jacobsen (2002) continues by raising the question: can a researcher be totally unbiased? We cannot be totally unbiased, but Dahlgren, Emmelin and Winkvist (2004) writes that the researcher can maintain a distance from the observed object or question, for a greater chance of being objective. We receive most of our answered through email and by that keeping a good distance to our participants.

The amount of recipients are also a weakness of the qualitative method, as it is usually far less then in a quantitative study. In our case it is important that we raise the question of whether or not the participants are representative for others then themselves (Jacobsen, 2002). We never reach saturation, a situation when a new interview do not add new information to the study (Dahlgren, Emmelin and Winkvist, 2004).

5 Empirical Findings

The result from our questionnaire and interviews are presented in this chapter. The different kind of internet stakeholders we have contacted are legal authorities, ISPs, and CPs. An overview of the responses are presented in the table below, with the rest of the chapter being dedicated to presenting our findings.

Table 5.1. Stakeholders' response overview.

Internet Stakeholders	
Legal	
PTS	
ISPs	CPs
Comhem Tele2 Telia	MTG (Viaplay) SF Anytime TV4 SVT

We have placed the legal authorities on top of the ISPs and CPs, as it is our view that they set the stage upon which the ISPs and CPs can act. There are communication between all parties, and other possible stakeholders as well, but a model is a simplification of reality and therefore makes some generalizations.

5.1 Response from legal authorities

PTS

The result of an extensive interview with PTS resulted in a deeper understanding of the market. The representative has been involved in the implementation of the new regulation from EU, which was put in practice on 30 April 2016, just as this thesis is being written. Recently there has been an active debate on net neutrality in Sweden, with focus on the zero-rating offerings from Telia and Tre. PTS are initially looking at specific aspects of the offerings, and cannot at the current date say if zero-rating as a whole is problematic or not. Even if the new rules are in effect as this is being written, the regulating agency BEREC will draw up guidelines for how the regulation can be interpreted, and PTS as well as the other NRAs should take the utmost account to the new guidelines.

There is a common understanding that is shared with PTS that internet stakeholders might not be so keen on responding to our requests, for several reasons. The topic of net neutrality is widely debated at the moment, the new rules are being put in practice just as we are contacting them, and it is not clear how PTS will act upon these rules, and might not be until after the summer when BEREC's guidelines are completed.

Since PTS is the only legal authority we have been in contact with, we will not make a separate summary here.

5.2 Response from ISPs

Comhem

From our interview with Comhem we started with getting a statement that it is the continuation of an open internet that grows that is most important for Comhem. They are against all forms of blocking or throttling, but also mentions that they have some legal responsibilities for doing so related to criminal activities. While it is their wish not to discriminate traffic, some prioritization has to be done during peak load, to ensure a satisfactory service to their customers. We get an example of this, with video streaming services at Friday evenings when a lot of customers are using the service, and it is sensitive to delays. Then prioritization of such a service might be done, services not requiring real-time streaming might get delayed. There is a future long-term concern with OTT (Over-the-top) market, where third-party content providers like Netflix are generating a lot of traffic, and it will affect all services provided by the ISP. It is not a topic discussed at the moment, but something on the horizon.

There used to be some discussion between Swedish ISPs, initiated by PTS, but since the European Union has raised the net neutrality questions further lately, the separate Swedish debate has slumbered. They have taken notice on zero-rating offerings by Tre and Telia, and are awaiting the guidelines from BEREC that are being prepared based on the latest net neutrality rules that are being implemented on 30 April 2016. These guidelines are expected to be ready after the summer of 2016. Comhem has a pragmatic way of looking at the issue of net neutrality, and the market is believed to function properly, much because of the healthy competition and transparency. There is a view that PTS has a pragmatic history, and that OTT services might be something of increasing concern over the next couple of years is a point of view that stands out a bit, since most reported long-term concerns hasn't been that specific.

Tele2

Tele2 have a four page official policy on net neutrality and it gives us the impression that it is something Tele2 have thought of and are serious about. They use the term Open Internet synonymously with Net Neutrality, and they have their own definition that says:

"An open internet (i.e. net neutrality) is when customers can make their own choices about what applications and services to use and are free to decide what lawful content they want to access, create, or share with others" (Appendix A.4.1).

Further they describe three cornerstones of the open internet, which from their view are (1) No blocking, (2) No unreasonable discrimination, and (3) Transparency. The cornerstones are discussed further, then we enter some specific discussion of traffic management, specialized services, and data protection regulation. While there certainly are a theoretical dimension in the first part, the latter parts are concerned with commenting specific issues concerning net neutrality from the perspective of an ISP, and specifically a wireless ISP.

If we leave the official document and look to the rest of our questions, Tele2 has a pragmatic view from their own perspective, but believe that the debate is at a more theoretical level and perhaps not something of a real concern in Sweden today. They comment on the recent zero-rating offers and it is in the view of Tele2 not a part of the net neutrality as it does not prioritize traffic.

Telia

Telia commented on their latest zero-rating offers, and it is their view that it does not violate net neutrality principles, as no prioritization or blocking of traffic is done, which they point out several times later in their response as well. They acknowledge the latest rules from EU and mentions that they are interested in how these are to be interpreted in Sweden. The response has also an economic perspective as the focus is on customers and Telia's offerings, specifically the selected social media services offered at a zero-rating deal on some of their subscriptions.

Summary of ISP responses

All contacted ISPs report to have some concern over net neutrality issues. They all have some official policy, but the extent of that does vary, and all are pro net neutrality on a theoretical level. The focus are on a more pragmatic level, and the concern is how to offer a good service to their customer, which includes traffic management to avoid congestion, and various ways to improved QoS. The concerns are viewed from user experience, service offerings, and performance of the connection. There is a view that the competition is at a healthy level in Sweden, and that the latest zero-rating offerings does not violate net neutrality rules, but the latest revision from EU, and how PTS will interpret those rules are on the radar. The guidelines will be presented from BEREC and the outline how the rules could be interpreted. There is also a mentioning of OTT services that in the next couple of years are expected to increase, and that might challenge the capacity of the network.

5.3 Response from content providers

MTG (Viaplay)

MTG has a clear standing that net neutrality is an important topic, not least in mobile internet connections. They have supplied an official letter written together with SVT, TV4, and SBS Discovery in 2014, which outlines principles that are believed to be of particular importance for net neutrality in Sweden. It includes topics like that no discrimination should be made, the importance of the open internet for innovation and competition, transparency to allow users to make informed decisions and the more difficult matter of how specialized services like IPTV should be allowed to be prioritized. There is a belief that the competition in Sweden has been functioning well, but that it still requires constant monitoring to be able to guarantee the continued openness in regards to the ever changing technological and content offerings.

SF Anytime

No official policy for net neutrality exists. The belief is that the net neutrality principle is good, but they would like to see banning of sites that are hosting copyrighted material. It is not something that is on the agenda in their discussion with ISPs. Not being a full policy it is more difficult to categorize, but it has pragmatic tone and they seem to be in line with current net neutrality policy in Sweden.

SVT

The response from SVT is that they take net neutrality very seriously. The concern is of the development of the open internet and that the recent zero-rating from Tre and Telia, that from SVT's point of view is a clear violation of the net neutrality principle. A comparison of zero-rating with a walled garden situation is made, where a subscription service that has used all of its data plan in effect will become a walled garden internet. There is also a concern that ISPs in the future might start to demand payment from CPs because of the high stress they make on the networks.

TV4

We got a shorter answer from TV4 that focused mainly on regulatory issues and competition. The view is that a tiered internet is something not preferred, but that a high internet capacity would ensure that heavy prioritization, nor fast lanes, should not be needed. In Sweden today it is believed that the capacity is high and with good competition, and that would make the Swedish debate somewhat less of an issue than in countries with worse connection speed and quality.

Summary of CP responses

From the four content providers we got in contact with, the responses were more differentiated compared to the views of the ISPs. The scope and content of their policies have similarities, but also differs in other areas. A high capacity network seems to be an ever positive thing, since that will make prioritization less necessary, but the level of concern from particularly SVT was much higher, but also concerns from MTG, and indirectly through the open letter supplied by MTG, also TV4, and Discovery, was somewhat different than those of the ISPs. The view of SVT is more forward looking and issues that are arising today might have strong implications in the future. That makes the role of the regulators more important and that is also something that is brought forward in the attached letters (Appendix A.4).

5.4 Overview of current zero-rating offerings in Sweden

Since zero-rating has been shown to be the focus of much debate, we have included a summary of the current offerings as of May 2016. The list is not exhaustive from an ISP point of view, but includes the three ISPs we have been in contact with (Comhem, Tele2, Telia), as well as other with zero-rating offerings (Tre).

Telia is offering a range of social media platforms that does not affect the data plan limit, which include Facebook, Instagram, Messenger, WhatsApp, Twitter and Kik. It is worth noting that all but Kik and Twitter are owned by Facebook. It is automatically included in their plans “Telia Mobil Komplet” and “Telia Mobil Dela”. Telia will not provide how much data is consumed by the included services. Telia does not detail how their technical implementation of the free services are done, but they state that the free services does provide non-personal information to the ISP (Telia, 2016).

Tre offer all its subscription customers a range of music services, which include Spotify, Deezer, Tidal, Google Music and SoundCloud (as of 2016-04-21) that does not count towards the data plan limit. It is offered with no action from the end user and there is a limit of free streaming of the mentioned services at 70 GB. Tre will provide information of how much data the free music services has consumed (Tre, 2016).

Table 5.2. Current zero-rating offerings.

ISP	Music									Social Media						
	Apple Music	Deezer	Google Music	Groove Music	Pandora	Spotify	SoundCloud	Tidal	Facebook	Google+	Instagram	Kik	LinkenIn	Messenger	Twitter	WhatsApp
Comhem	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tele2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telia	-	-	-	-	-	-	-	-	X	-	X	X	-	X	X	X
Tre	-	X	X	-	-	X	X	X	-	-	-	-	-	-	-	-

In the table we have included a few other popular music services like Apple Music, Microsoft’s Groove Music, and Pandora, as well as the social media platforms Google+ and LinkedIn, to point out that there are larger players not being included. There are also a wide range of smaller services, non that are included in the table above.

6 Discussion

We will outline the current status in the Swedish context, and see where the debate lies and compare this to the more general approach we have used to describe the principles of net neutrality in the previous chapters. We have connected the empirical findings to theoretical framework, which will provide a picture of how the stakeholder's views are in comparison with the literature in the area.

Our view on the concept of net neutrality

Prioritization of network traffic, especially with the rise of mobile networks, seems to be a given today. While there is a range from a fully neutral net to an anything goes situation, all of our findings end up somewhere in between. The fully neutral net in lines with a true *dumb pipe* style of network that probably only can be achieved in a satisficing way with over-provisioning, and a totally unregulated environment does not seem to be wanted by any part, although their views differs a lot here. From our point of view, as long as the prioritization is done equally for the same type of content and not depending on provider, it is not violating the principles of net neutrality. This will allow for QoS related methods like *traffic shaping* and *deep packet inspection*, that seems to be something we have to get used to, based on technical development, in particular in wireless networks, or legal requirements like crime prevention. We believe that the core principle behind net neutrality is to keep a level playing field and to comment on the current debate on zero-rating we believe that to be a violation of that principle. We believe that the statement from the Telecom Regulatory Authority of India has summarized our view on zero-rating well: *"No service provider shall offer or charge discriminatory tariffs for data services on the basis of content"* (BBC, 2016).

6.1 Theoretical framework applied to empirical findings

This part connects the empirical findings to the theoretical framework presented in chapter 3. We are aware that the answers might be colored by the respondents' position in the organization. Our respondents' should be able to comment on the net neutrality issue, but their background, knowledge and position in the company might cause them to have a certain perspective or depth of knowledge.

6.1.1 Legal authorities

PTS has an outspoken pragmatic view on this topic and will look at the consequences of such an offering, if e.g. customers are affected in what services they are using. There is some similarities to Hahn and Wallsten (2006) in that view. As pointed out earlier, net neutrality law in EU has been criticized of being too weak (Kaur, 2015; Summers, 2015), but that is seen in other light from PTS, as the not so detailed rules will leave room for each country to interpret them in a wide variety of situations. It might be difficult for an organization to know how PTS will act because of this approach, but it is seen as a strength and not a weakness from PTS. The guidelines that will be presented from BEREC will make the rulings from the NRAs more predictable for organizations. Most of all the more general approach provides a tool that might be used for future, unpredictable, scenarios. Rules that only applies to problems in the past are

not very useful. This has much in common with the view that Shin (2014) has, where he believes that the unpredictability of the market makes it difficult to predict and to steer, making competition and transparency attractive, and not to make rules too specific.

6.1.2 ISPs

Comhem has a pragmatic view, which has much in common with Jordan (2011). It is also pointed out that this prioritization is not done per content supplier, but at content type level. The pragmatic way of looking at the issue, and the market is believed to function properly, much because of the healthy competition and transparency. There is a view that PTS has a pragmatic history, and that OTT services might be something of increasing concern over the next couple of years is a point of view that stands out a bit, since most reported long-term concerns hasn't been that specific.

Tele2's much more pragmatic view has much in common with Jordan (2011) and focuses much in technical aspects in a pragmatic way, and we see that the technical discussions are based much upon the legal debate and regulation. Tele2 believes that the debate is at a more theoretical level and perhaps not something of a real concern in Sweden today. They also comment on the recent zero-rating offers and it is in the view of Tele2 not a part of the net neutrality as it does not prioritize some traffic. The overall impression is a pragmatic and "hands off" view similar to that of Hahn and Wallsten (2006) and Shin (2014).

Telia's view could be said to have parallels to Hahn and Wallsten (2006), Shin (2014) and perhaps even Tardiff (2015), as emphasis is on economical perspectives and a pragmatic view. Having a zero-rating offering it was expected that they would be pro that, and also comment on it given the recent debate where the zero-rating offerings are criticized.

6.1.3 Content Providers

MTG (Viaplay's) view has much in common with both Hahn and Wallsten (2006), as well as Marsden (2010), and can be categorized as pro positive net neutrality, where focus is on competition and innovation, not on regulation.

SF Anytime has no official policy for net neutrality. We have chosen to not include SF Anytime in the framework overview (Fig 6.1) because of that the answer is too short to pinpoint. The view can be said to be pragmatic, but not much more than that.

SVT's answer is a bit different. Most other responses were in line with current regulation, and not touching too much on current issues, but instead speaking of competition, healthiness of the market etc., but SVT's view is more in-depth. Even though SVT's view has both theoretical and pragmatic perspectives, it reminds us mostly of Read (2012) and Schewick (2015). The response was also more in-depth and longer than most.

TV4 provides an answer that competition among ISPs will ensure a healthy market, and that *fast lanes* are a bad thing. The view seems more theoretical as it does not touch upon specific

issues, and would have much similarities with the end-to-end principle that Marsden (2010) adopts.

6.2 Graphical representation of answers

Here we have incorporated the views from the recipients, into the framework to show a clearer picture of how the ISP and CP stand alongside the theory. SF Anytime is left out for providing a too short answer, making it difficult to pinpoint in the framework.

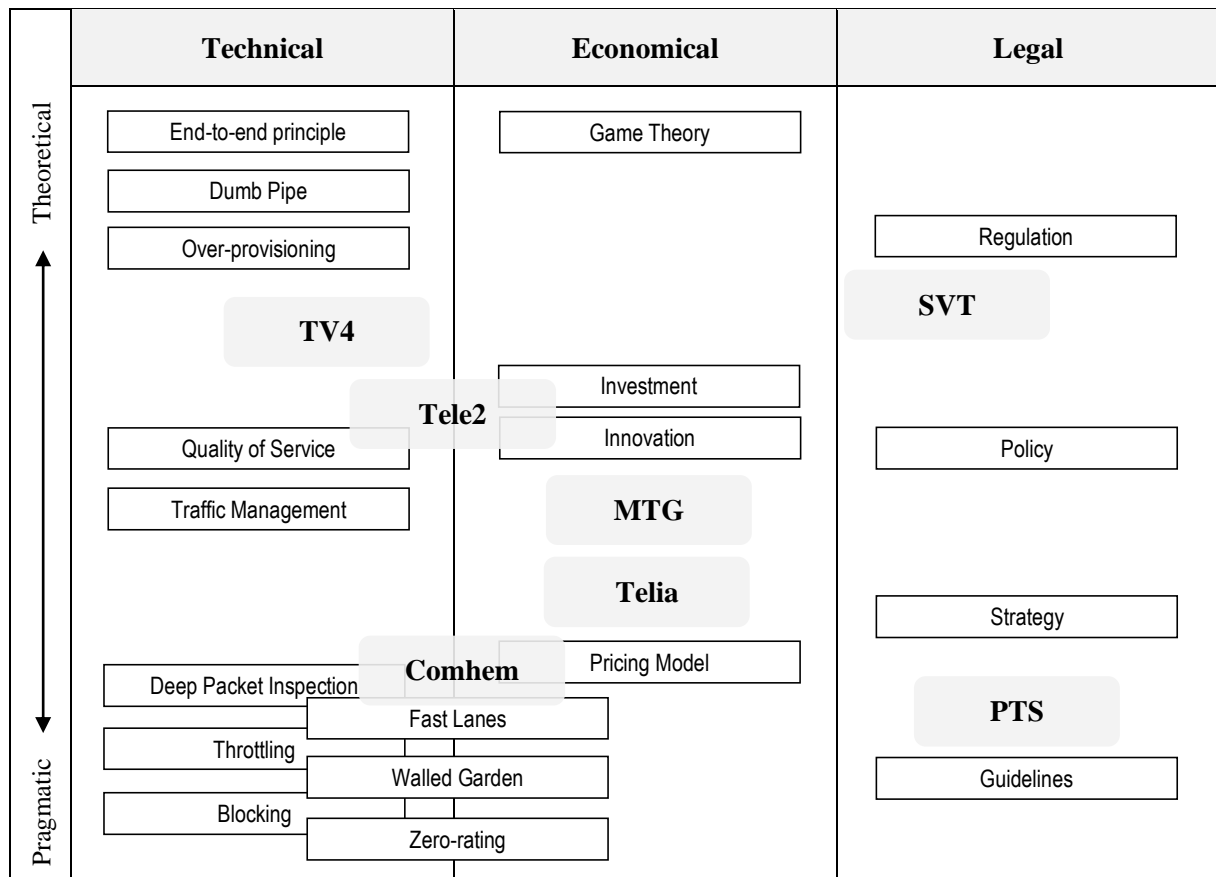


Figure 6.1. Applied theoretical framework.

The interpreted view is not able to fully be presented in just one area, but it represents what we believe is the core of the reported views. To visualize the response further we have summarized the tense of the answer in a figure 6.2.

Past	Present	Future
	Tele2	
		PTS
		SVT
	SF Anytime	
	Telia	
TV4		
MTG		
		Comhem

Figure 6.2. Interpreted time dimension of answers.

The time dimension is difficult to pinpoint exactly, but we still believe that there are elements of the answers and policies that has more connection to the past, present, or future, shown in the figure above.

6.3 Further discussion

Is regulation one step behind?

Many recently published articles we came across during the writing of this thesis criticized the latest regulations from the European Union to be too vague or too little. Many of them were signed by experts in the field. It is easy to get that impression, but our interview with PTS provided us with another perspective. PTS has a more pragmatic view and also reports the net neutrality rules to be more loosely defined, but that will allow them and other NRAs to apply them more generally and to provide solutions to future problems, not just the past once that a more specific set of rules might be better at. That approach has obviously advantages, but at the same time also opens up for more loop holes to be exploited. The views of the European Union and PTS seems to be well aligned on this approach. Based on that it is not our view that regulation is one step behind, but that it is an active choice from the regulators that has its own pros and cons.

It is too soon for us to be able to tell what effect the new regulations will have on the net neutrality debate. The reasons for this is that the regulations was put into effect during the finalization of our report and many of the stakeholders is waiting for BEREC to publish the guidelines for how to interpret and use the new regulations. These guidelines is scheduled to be published in the last part of august. We believe that the guidelines will help the stakeholders to easier interpret and act accordingly to the new regulations.

Duality in organizations

Several companies seems to have a two-sided relationship with net neutrality, where they on one hand might exploit loopholes in regulation or unregulated areas, but at the same time they are interested in more detailed and precise regulation so that everyone can play by the same

rules. One example where we have seen this behavior is Netflix, that has been using *fast lanes* for their service to reach a higher quality at end users than its competitors, but at the same time they are involved in coalitions criticizing EU regulations for being too broad.

A kind of duality can be seen in many of our responses from ISPs as well, where the answers or official policy often start with that the organization has a positive view on net neutrality and that it is a topic of high concern, but this seems to be on a much more theoretical level. When the policies becomes more pragmatic, they raise concerns about prioritization of traffic, specialized services, and other practical aspects. While a pragmatic approach might be expected from an ISP, it might give a false impression if such a policy is only read briefly, since there are parts that a net neutrality purist would definitely oppose against. From our point of view there is nothing extraordinary in these policies, but it is worth pointing out.

Zero-rating

The most recent topic in the realm of net neutrality has been focused on zero-rating. Zero-rating is usually considered to not be included in net neutrality policy today, but in the debate there is a call for it to be included, and it is also in the pipeline to be included legally in some way. Much like the duality in organizations, zero-rating is a concept that will allow ISPs to offer something more to their customers, compared to their competitors that are not doing so at the moment. If one has a more strict view of net neutrality, where technical aspects of how traffic is treated is the core, zero-rating is not an issue since there is no actual prioritization of traffic being made. If a more broad view is applied, where the purpose of net neutrality is to keep the internet free and open by applying the end-to-end principle, and by keeping a level playing field, zero-rating does indeed impact both consumer behavior and CP abilities to compete or enter the market. The hot debate on the topic might suggest that more have adopted the latter view.

A delicate topic

Since our response rate was only 31 percent, the lack of responses is something we have to comment on. We believe that a combination of the delicate topic, at the moment hot debate and new regulations being put in place has played a major part in the low response rate. This view is also in line with what came up in our interview with PTS. Our responses was mostly from larger organizations and we also believe that smaller organizations might neither have an outspoken policy, nor someone responsible for net neutrality questions. A lack of answer might be the easy way out and others could just be waiting on the BEREC guidelines to give them clarification. A weakness in this study is the small amount of respondents. Because of that we think the result should not be apply on the entire Swedish market.

Stakeholders view on net neutrality

The presented research question has been answered throughout the thesis, with the empirical findings, reflection from the theoretical framework and other literature, and not least input from the current debate. To summarize that view is to answer our research question, and that is done in the conclusion.

7 Conclusion

The purpose of this thesis was to examine the views of internet stakeholders in Sweden, from the perspective of net neutrality. There does not exist one single definition of what net neutrality is, which makes defining the principle of net neutrality in the context of this thesis important. We believe that the core principle behind net neutrality is to keep a level playing field, but at the same time we adopt a pragmatic view, and realize that QoS-related aspects is something that must be allowed today, especially in wireless networks based on technical limitations like attenuation and interference. In practice there is a fine balance between keeping the internet open and allowing the ISPs to use a reasonable amount of traffic management.

All contacted ISPs report to have some concern over negative net neutrality issues like blocking and throttling, as well as positive net neutrality issues like QoS and traffic management. They have some official policy, but the extent of that does vary, and all are pro net neutrality on a theoretical level. The lack of one single definition makes such statements less comparable. The view on pragmatic issues are more specific and there are concerns of (future) network capacity, particularly with the rise of OTT services.

The view of the CPs is not as homogenous as for ISPs, but their different policies all have some degree of similarity. They are all positive to high capacity networks, because that makes prioritization of different data less important. The extent of concern or policy also differs a lot, as well as the perceived timeframe, where some are more concerned about current issues, and some more looking ahead.

Our interview with PTS provided us with an in-depth knowledge of the market, and how the new regulation was being implemented. Some of our thoughts were confirmed during the interview, like the delicate nature of the topic that might have led to the low response rate. For the regulation it is still not able to say exactly what implications it will have, since the guidelines from BEREC will allow stakeholders, both NRAs like PTS, as well as ISPs and CPs, to act upon this new regulation. Because of this, several of the respondents have reported that they are awaiting the new guidelines, and this may also have contributed to the low response rate. PTS has a pragmatic view and the fact that the regulation is not so well defined also means that it might be applicable in a wider range of scenarios, instead of solving a too specific issue.

7.1 Future research

The topic of zero-rating is particularly interesting to us, as it is in a gray area of the net neutrality topic, where the debate of its status as violating the principles of net neutral net or not is something everyone today may have an opinion on. To further explore this area in the near future would be of particular interest, perhaps after BEREC's guidelines has been made official at the end of the summer in 2016.

Also to further expand on QoS and what related aspects should be considered to be positive or negative net neutrality, or if it is purely economically motivated efforts that are behind new developments in the area of net neutrality.

Appendix

A.1 Questionnaire and e-mail responses

The following questions were sent out as a form to a number of ISPs and CPs. Their response are presented in this appendix in their original state and are summarized in the thesis.

1. Can you describe your role in company x?
2. How does company x position itself in the topic of net neutrality?
3. Do you think that there are any positive or negative aspects of keeping a high level of net neutrality?
4. Does, to your knowledge, company x treat all traffic alike?
5. Is there communication about net neutrality between companies in Sweden?
6. How does the future of net neutrality in Sweden look, from your perspective?
7. Are there pressure from stakeholders in the industry to prioritize their traffic?
8. Do you have any other thoughts about net neutrality?

Responses from Internet Service Providers

Tele2

Date: 2016-04-01

1. Kan du kort beskriva din roll på Tele2?

Jag är chefsjurist för Tele2 Sverige och för närvarande även tf nätchef i samma bolag.

2. Hur ställer sig Tele2 i frågan om nätneutralitet?

Se bifogat dokument som ger uttryck för vår generella syn på frågan [Appendix A.4.1].

3. Tycker du att det finns det några positiva eller negativa aspekter med att försöka hålla en hög grad av nätneutralitet?

Se bifogat dokument som ger uttryck för vår generella syn på frågan [Appendix A.4.1].

4. Behandlar, i din vetskap, Tele2 alla kommunikation lika?

Se bifogad trafikhanteringspolicy som vi agerar i enlighet med.

5. Diskuteras det om nätneutralitet mellan de olika operatörerna på den svenska marknaden?

Post- och telestyrelsen (PTS) initierade tidigare ett arbete mellan alla operatörer och flera innehållsleverantörer där syftet var att försöka hitta en gemensam svensk syn på frågan (en slags branschöverenskommelse). Detta arbete avstannade dock i samband med att EU började arbeta med en reglering av frågan. Status nu är oklar för mig men kan ni säkert kolla med PTS.

6. Hur ser framtiden ut för nätneutralitet i Sverige sett med dina ögon?

Frågan diskuteras för närvarande mer på ett teoretiskt plan snarare än att botten i faktiska förhållanden på marknaden.

7. Finns det påtryckningar från intressenter i branschen om att prioritera deras trafik?

Finns inga sådana påtryckningar från intressenter. Det som däremot är mer aktuellt är sk zero rating, dvs där kundernas användning av en viss tjänst ej dras från den datavolym som ingår i deras datapaket ("3" har börjat tillämpa detta för musiktjänster och även T-mobile i USA använder detta). Detta är dock enligt vår syn något annat än nätneutralitet eftersom det inte innebär att trafik prioriteras över annan trafik.

8. Har du några andra tankar kring nätneutralitet?

Är som sagt mycket en teoretisk diskussion snarare än ett verkligt problem i Sverige i nuläget.

Telia

Date: 2016-04-29

1. Hur ställer sig Telia i frågan om nätneutralitet?

Nätneutralitet är en mycket viktig fråga som vi följer noga. Vi är för ett öppet nät och för nätneutralitet. Vårt nya erbjudande om fri surf i sociala medier ger kunderna ännu mer surffrihet, vi gör ingen prioritering av trafik eller någon typ av blockering, därför menar vi att det inte står i konflikt med nätneutraliteten.

2. Tycker du att det finns det några positiva eller negativa aspekter med att försöka hålla en hög grad av nätneutralitet?

Nätneutralitet handlar om att möjliggöra för kunder att få access till information och annat innehåll, använda appar och olika enheter för att få ut så mycket av internet som möjligt. Dessutom handlar det bland annat om blockering av tjänster och prioritering av trafik. Vår nya tjänst ger kunderna möjlighet att få ut mer av internet och vi använder ingen prioritering eller blockering utan det är enbart så att trafiken undantas från våra kunders mobildatamängd. Vi prioriterar alltså inte trafik, då det strider mot nätneutraliteten

3. Behandlar, i din vetenskap, Telia alla kommunikation lika?

Den 30/4 kommer nya EU-regler (tidigare EU-förordning) att gälla för nätneutralitet inom EU. Vi följer självklart utvecklingen av PTS utredning kring hur lagen ska tolkas just i Sverige.

4. Finns det påtryckningar från intressenter i branschen om att prioritera deras trafik?

Vi är även öppna för fler samarbeten när det kommer till vår kampanj för fri surf i sociala medier.

5. Har du några andra tankar kring nätneutralitet?

Det viktigaste för oss är att våra erbjudanden ska vara så attraktiva som möjligt för våra kunder. Våra kunder har olika behov och därför anpassar vi vår produktportfölj med olika produkter och tjänster. Nu vill vi skapa ännu mer värde i våra tjänster genom att låta våra kunder hålla kontakt med familj och vänner via sociala medier, men också att kunderna numera kan flytta med oförbrukad datamängd till nästa månad.

Responses from Content Providers

MTG (Viaplay)

Date: 2016-04-27

1. Hur ställer sig Viaplay i frågan om nätneutralitet?

MTG anser att principen om nätneutralitet är viktig. Vi har i olika sammanhang beskrivit detta som en digital allemansrätt. När det gäller distribution via mobila bredband måste nätneutraliteten värnas. Kunderna ska betala för en viss hastighet och kvalitet oavsett vilka tjänster de efterfrågar, så länge tjänsterna är lagliga och inte skadar nätverken. Bredbandsoperatörer ska inte kunna prioritera vissa tjänster, styra innehållet eller ta betalt en gång till för den kapacitet de har utlovat att leverera till slutkonsumenterna. Vår syn på nätneutralitet är i allt väsentligt gemensam med våra branschkollegor. I bifogad skrivelse till regeringen (till då ansvariga/berörda statsråd) har vi tillsammans med TV4, SVT och Discovery utvecklat vår syn på Nätneutralitet.

2. Tycker ni att det finns det några positiva eller negativa aspekter med att försöka hålla en hög grad av nätneutralitet?

I enlighet med ovanstående svar/skrivelse finns en lång rad positiva aspekter på nätneutralitet som vi vill framhålla. Ytterst handlar det om transparens och konkurrens gentemot slutkonsumenten. Kunderna ska veta och ha rätt till den kapacitet de har betalat för och kunna välja ett brett utbud av innehållstjänster

3. Behandlar, i eran vetenskap, Viaplay alla kommunikation lika?

Ja.

4. Diskuteras det om nätneutralitet mellan de olika operatörerna/content providers på den svenska marknaden?

Vi har under lång tid haft ett nära samarbete med våra branschkollegor när det gäller synen på nätneutralitet, och självfallet haft diskussioner med operatörerna, liksom med berörda departement (Näringsdepartementet och Kulturdepartementet) och myndigheter (Post- och Telestyrelsen och Myndigheten för Press, Radio och TV). Det gällde inte minst tiden fram till hösten 2015 då EU fattade beslut om gemensamma riktlinjer när det gäller nätneutralitet. Inför det beslutet deltog MTG aktivt i olika diskussioner och konsultationer både i Sverige och på EU-nivå. Vi arrangerade också ett stort seminarium om Digital Allemansrätt och Nätneutralitet under Almedalsveckan 2015 med medverkande från hela branschen och företrädare för politiska partier och myndigheter m.fl.

5. Hur ser framtiden ut för nätneutralitet i Sverige sett med era ögon?

I grunden finns en gemensam reglering inom EU som ska garantera nätneutralitet, ett öppet internet och förhindra betald prioritering för specifika tjänster. Vi upplever också att den svenska regleringen hittills har fungerat väl, och att det finns en medvetenhet hos PTS om att värna och upprätthålla en fungerande nätneutralitet. Med de snabba förändringar som sker på

marknaden, både när det gäller innehållstjänster, distribution och frekvensutrymme och kapacitet m.m. är det dock viktigt att följa utvecklingen och säkerställa att nätneutraliteten upprätthålls.

6. Finns det påtryckningar från intressenter i branschen om att prioritera deras trafik?

Det finns självfallet en del olika synpunkter när det gäller nätneutralitet mellan innehållsleverantörer och en del operatörer, men hittills har som sagt regleringen kring nätneutralitet i Sverige fungerat i huvudsak väl.

7. Hur ser Viaplay på trenden Zero-rating?

Det är en fråga vi följer noga och som på sikt skulle kunna medföra en snedvridande prioritering av trafik.

8. Har du några andra tankar kring nätneutralitet?

Vid sidan om ett fungerande regelverk är det starkaste skyddet att det finns en sund konkurrens och flera aktörer på telecom-marknaden.

[Supplied official document on net neutrality. Sign by four of Sweden's biggest content providers, see Appendix A.4.2]

SF Anytime

Date: 2016-04-28

För att vara helt ärlig så har vi ingen officiell uppfattning om nätneutralitet. Den är självfallet en god grundläggande princip, men det finns ju också både legala och affärsmässiga invändningar. Vi är självfallet för att man till exempel stryker "pirat-trafik" i näten (Pirate Bay och fulstreaming). Men frågan är inte speciellt högt på vår agenda och den dyker sällan eller aldrig upp i våra diskussioner med operatörer.

SVT

Date: 2016-04-27

1. Hur ställer sig SVT i frågan om nätneutralitet?

SVT anser det är väldigt viktigt med nätneutralitet och driver frågan om reglering på EU-nivå.

2. Tycker du att det finns det några positiva eller negativa aspekter med att försöka hålla en hög grad av nätneutralitet?

För SVT med sina fria och icke-kommersiella tjänster är det av yttersta vikt att Internet förblir en funktion där alla aktörer konkurrerar på lika villkor om att nå ut till användarna.

3. Behandlar, i din vetskap, SVT alla kommunikation lika?

Ja!

4. Diskuteras det om nätneutralitet mellan de olika operatörerna/content providers på den svenska marknaden?

Ja!

5. Hur ser framtiden ut för nätneutralitet i Sverige sett med dina ögon?

Vi är i ett avgörande läge nu. Både 3 (musikstreaming) och Telia (sociala medier) lanserar nu zero-rate tjänster. Om inte lagstiftaren och regleringsmyndigheten (PTS) agerar på detta så ser det mörkt ut.

6. Finns det påtryckningar från intressenter i branschen om att prioritera deras trafik?

SVT är ingen telekom-operatör, så det kan vi egentligen inte uttala oss om. Men risken ligger nog egentligen åt andra hållet. Att operatörer vill ha extra betalt för att släppa fram stora videotjänster i full kvalité, eftersom detta innebär en stor belastning på deras nät. Streaming från SVT sker idag med dynamisk strömning i 7 olika nivåer, där den högsta nivån är på 2,7 Mbit/s. Man kan ju tänka sig att vissa operatörer kan tycka att det kan räcka med den näst högsta nivån på 1,6 Mbit/s för en så stor fritjänst som SVT Play.

7. Hur ser SVT på trenden Zero-rating?

Zero rating blir i praktiken en form av blockering. När du har använt upp din månadspott för surf, så blir ditt tillgängliga internet för resten av månaden en form av walled garden med endast tillgång till de tjänster som operatören har zero-rate på.

8. Har du några andra tankar kring nätneutralitet?

<http://vipatv.svt.se/204/kronikor/arkiv-for-kronikor/2016-04-27-natneutralitet---kampen-om-internet.html>

[Provides us with a link to a chronicle on SVT written by Per Björkman]

TV4

Date: 2016-04-28

Tyvär har ingen möjlighet att avsätta tid för detta men ni kan får ett par svar av mig. Jag svarar i egenskap av rollen Regulatory Affairs. Jag jobbar med olika regleringsfrågor bland andra den om nätneutralitet. TV4 är för en nätneutralitet som innebär att man inte ska dela upp nätet i olika nivåer. Vi anser inte att det är gynnsamt om det skulle finnas snabbare och säkrare nätvägar att köpa in sig på medan mindre snabba och säkra vägar skulle vara gratis. I vissa länder med sämre nät än i Sverige har bolag varit oroliga för att inte få kapacitet nog och därför förespråkat att man ska kunna säkra det man behöver genom att köpa plats. Vi vill hellre att allmänstandarden på nätleveransen ska vara så pass hög att den fungerar utan denna uppdelning. Vi ser framför oss ett väl utbyggt och stabilt nät i Sverige. Jag kan inte svara för hur andra företag agerar eller tänker, med anledning av övriga frågor.

A.2 Interviews

PTS

Date: 2016-04-03

1 Interviewer = **I**

2 Interviewer 2 = **I2**

3 Recipient = **R**

4

5 **I** - Vi läser sista året på systemvetenskapliga kandidat programmet vid Lunds Universitet. Det
6 är en utbildning inom framför allt informatik som är huvudämnet, systemutveckling och så. Vi
7 har intresserat oss för nät neutralitet för vår kandidatuppsats. Vi har valt att se hur synen på
8 nätneutralitet skiljer sig mellan ISP och CP med flera.

9

10 **I2** - Sen är det också så att beroende på vad vi hittar och vad du säger t.ex. under arbetets gång
11 så får vi ju kanske en annan bild av nätneutralitet och det är ju mycket aktuella debatter som
12 pågår.

13

14 **R** - Verkligen, det är har ju böljat lite fram och tillbaka i nätneutralitetsdebatten. Ibland så är
15 den väldigt het under en period sen så dyker det lite för att sedan komma upp igen. Det går lite
16 i vågor verkar det som, men nu har vi fått ett regelverk som kanske kommer att belysa det här
17 området lite mer kontinuerlig eller vad vi ska säga.

18

19 **I** - Precis, och vad jag så förstod senast vi samtalade lite kort, så är du ansvarig för det nya
20 regelverket?

21

22 **R** – Ja, man kan säga så. Även om det inte är direkt formaliserat så är det så att jag har haft
23 ansvar för implementering av den interna implementeringen ut av den här förordningen som
24 börjades tillämpas 30/4 som heter 2015:2120, och som handlar om bevarandet av ett fritt
25 internet och lite mera precis vilka regler runt affärsmetodik och trafikstyrning, prioritering av
26 särskilda tjänster och lite mera specifika konsument rättigheter kopplat till detta här. Så det är
27 det som jag har jobbat med och gör alltså, men nu är visserligen regelverket implementerat.
28 Vi ser att det kommer bli ganska mycket arbete kring detta i och med är så pass aktuellt inte
29 minst för att det finns affärsupplägg på marknaden idag som har kommit med tiden kan man
30 väl ändå säga, som är inne och så att säga tangerar det här området. Det finns ganska tydliga
31 kopplingar till aspekter av de här regelverken och sedan är det ganska hög medial bevakning
32 på det också, så det är ju allmän intresset och media är ju ganska intensivt detta just nu.

33

34 **I** - Vi såg att det kom en skrivelse idag får några mediahus om Telias zero-rating.

35

36 **R** – Ja, zero-rating är något som florerar friskt nu. Det är ju ett koncept som kan ta väldigt många
37 olika former skulle man kunna säga. Det som vi sagt från PTS är väl att när tittar vi på ett sådant
38 här upplägg så är det oftast en specifik aspekt utav en sådan differentiering, affärsmetod eller
39 vad du vill kalla det som vi kommer att belysa och inte kanske zero-rating som koncept
40 egentligen. Även om vi har möjlighet att pröva affärsmetoder som exempelvis zero-rating utgör

41 så är det snarare så att ingången med utgångspunkt från det här regelverket är kanske en viss
42 del eller aspekt av ett sådant erbjudande.

43

44 **I** - Ja, har man koll på hur läget är i Sverige med nätneutralitet över lag och om operatörerna
45 sköter sig eller? Vet du om detta mäts på något sätt? Eller samlar in information på något annat
46 sätt?

47

48 **R** - Ja, alltså nätneutralitet till och börja med är regelverket ju en kompromiss som har tagits
49 fram på EU nivå då en förordning som är direkt tillämplig i Sverige och i alla EU-länder plus
50 ytterliga några länder som är ansluta via EEA. Det fångar vissa aspekter ut av nätneutralitet,
51 alltså jag menar så här att om man använder begreppet nätneutralitet så är det ju tacksamt och
52 så att det blir man kan inte med automatik säga att förordningarna tar upp alla
53 nätneutralitetsaspekter utan det vi får se förordningstexten som vad den är och att den omfattar
54 vissa delar som har man under beredningens gång fått skala av vissa delar. Men om man tittar
55 på regelverket nu då som vi har fått här så antyder ju det att man kan mäta, temperatur mäta så
56 att säga, hur sund marknaden är i avseende av dessa aspekter. Bland annat genom quality of
57 service-parametrar och det är ju i första hand prestationsmått på bredbandsanslutningen. Några
58 variabler som nämnts är svarstider, varians i svarstider, paket förluster. Man kan förstås mäta
59 andra parametrar med dessa är exempel. Det är väl ganska bra mått, i Sverige så mäter man väl
60 kanske inte just paket förlust i någon jättestor utsträckning. Vi har ju en stiftelse som heter IS
61 som hette tidigaste .SE som tillhandahåller det här verktyget som heter bredbandskollen.se. Det
62 mäter svarstider och det är väldigt utbrett och använt, de har ju miljontals mätningar. Det är på
63 olika tekniska plattformar som den mätningen sker. Det finns väldigt bra internet statistik i
64 Sverige.

65

66 <kontakten försvinner här några få sekunder>

67

68 **R**- Vi har en bra prestation, vi har en sund utveckling. Folk får mer bredband för pengarna och
69 de flesta får bättre och bättre anslutning. Det är ju den generella bilden, det skulle jag vilja säga
70 utan problem. Men att säga att vi har mätt nätneutralitet då, det är inte riktigt samma sak då
71 tycker jag. Då blir det frågan om mycket mera sofistikerade mätningar och det kräver en helt
72 annan, man kan ju inte bara titta på prestationer i olika anslutningar formerna och tekniker. Man
73 behöver gå lite djupare. Men där är vi inte riktigt än att vi mäter. Det är inte så enkelt att mäta,
74 man måste veta vad man gör och det är inte alltid regleringsmöjligheterna som kan marknaden
75 och den tekniska tillämpningen och den tekniska utvecklingen. Ibland är det andra aktörer som
76 kan dessa bitar och därför är det väldigt svårt att ligga i framkant kan jag tycka. Att göra
77 kvalificerad mätning.

78

79 **I2** - Är det något du känner? Att man ligger ett steg bakom?

80

81 **R** - Det är lite regelverkens natur att ligga bakom. Vi har ju lite olika ingångar på reglerna som
82 finns i som vi har att tillämpa inom myndigheterna. De går ut på att man ska ha en uppfattning
83 om och en prognos om vad som händer ett antal år framåt när man utarbetar skyldigheter. När
84 det gäller förordningen så är ju den ett politikiskt dokument som har arbetats fram då och drivits
85 av kommissionen som säger att vi ska ha en sådan förordning. Då ligger det i sakens natur att
86 man ligger efter. Man måste ta hänsyn till att alla medlemsländer måste kunna tillämpa detta

87 här så det måste vara generiskt utformat, så att man kan applicera det. Om man tänker sig att
88 utvecklingen som den ser ut nu så är det så snabbvärlig.

89
90 <kontakten försvinner här några få sekunder>

91
92 **R** - Långa diskussioner som ligger tillgrund för regelverket, sedan kommer regerverket. Det är
93 så man får se det. Vi är regelverkets ambassadörer så att säga.

94
95 **I2** - Jag tänker på att det är vissa länder har tagit mer egna initiativ, Nederländerna har nämnts
96 i Europa, att de lägger till ännu mera än vad som är kravet från EU.

97
98 **R** - Ok.

99
100 **I2** - Finns det något initiativ från svensk sida att lägga till mera till regelverken?
101

102 **R** - Jag tror att om man skulle säga att de finns en svensk linje i det här så är den mera väl mera
103 pragmatisk och lite mera inriktat på verkliga, vad ska vi säga mera uppenbara fall av
104 marknadsmisslyckanden i Sverige är ju en del vissa regleringsmyndigheter. Så kan man uttrycka
105 sig lite grovt, vissa regleringsmyndigheter är mer inriktade på mer demokratiska aspekter, alltså
106 att man ska kunna informera sig och kommunicera och att det finns en väldigt nära gräsrots
107 approach till den här typen av regler. Andra är väldigt tekniskt orienterade och vill ha mycket
108 mätverktyg och sådär. Det finns ju positioner i de här arbetarna. Den svenska är relativt
109 pragmatisk så att man ska få regler som är användbara. Den svenska linjen är inte att vi ska
110 praktisera och reglera utöver det som framgår av regerverket, utan vi ska ju hålla oss till dem,
111 de förutsättningar som ges där och de är tillräckligt goda skulle jag vilja säga.

112
113 Jag vet inte mer exakt vad du pratar om. Det finns ju länder i Europa som har före gått den här
114 förordningen och har haft nätneutralitetsregler redan innan. Alltså de har skaffat sig lagstöd för
115 att agera. Så har vi inte haft i Sverige, inte på det sättet. Sen finns det ju exempelvis ganska
116 viktigt del, transparens aspekten i det här regelverket. Där har ju Sverige varit lite mera på
117 hugget kanske än genomsnittet. Där har vi ju varit för att vi vill att kunderna ska kunna göra
118 välinformerade val och man ska veta exakt vad man betalar för. Man ska även förklara vilka
119 trafik aspekt policys man har som operatör så har vi haft tidigare. Det har tidigare framgått av
120 PTS allmänna råd. Nu har vi ett regelverk.

121
122 Just nätneutralitetsregler har funnits redan innan regelverket trädde i kraft. Men förordningen är
123 skriven på en sådan sätt att regleringsmyndigheterna får väldigt goda möjligheter att göra
124 åtgärder och tillsyn på det här området. Det kan man säga, man behöver egentligen inte gå
125 utöver det som står i regelverket. Regelverket ger ganska stora möjligheter, det så att säga en
126 brunn att ösa ur.

127
128 **I** - Vad tror du skulle ha hänt med internet om man ser till utveckling och innovation om man
129 inte skulle ha nätneutralitetsregler eller regelverk. Hur skulle internet forma sig då tror du?

130
131 **R** - Det är vanskligt att svara på, men såhär då. Oavsett om det är frågan om nätneutralitetsregler
132 eller konkurrensregler som också PTS har ansvar att titta på, så är det ju ofta som så att det är
133 olika komponenter som tillsammans gör att det blir komprometterade på något sätt. T.ex. att

134 om man resonera kring utvecklingen kring zero-rating som vi ser nu verkar var så pass
135 intressant för operatörerna att man vill lansera detta T.ex. att om man resonera kring
136 utvecklingen kring zero-rating som vi ser nu verkar var så pass intressant för operatörerna att
137 man vill lansera detta. Då kanske det inte nödvändigtvis erbjudandet i sig som är problematisk
138 utan vad det för konsekvenser på sikt och så där, eller vad det har för livslängd eller för
139 omfattning vilken räckvidd detta erbjudande har. Och hur det kombineras med andra saker. Det
140 är ju bra för kunderna att få zero-ratade tjänster antar jag, det behöver ju inte vara fel så länge
141 de är tillräckligt brett och man inte styr kunderna mot särskilda användningar, t.ex. för att man
142 är kapitalstark eller har en bra förhandlingsposition utan att det är en sund rörelse. Om detta
143 kombineras med annat på ett sätt så att det blir mer av en gråzon i förhållande till det här
144 regelverket.

145
146 Det är så jag skulle vilja svara på denna fråga, man vet inte vad som händer utan regler men jag
147 tror att de här reglerna skulle kunna ha en bra preventiv effekt alltså att operatörerna vet att
148 vissa vägar blir lite svåra för det finns regleringsmöjligheter om de går får långt. Vi vill inte ha
149 ett fragmenterat internet där det vanliga internet bara är en lite smal nisch och de här zero-rating
150 tjänsterna är huvuddelen av internet. Vi vill ju ha ett internet som är neutralt i den meningen att
151 vi kan vara en motor för innovation och man har full nåbarhet och man behöver inte oroa sig
152 för vem som är avsändare och mottagare att de ska sorteras eller selekteras i nätet beroende på
153 vem som använder det eller var du är lokaliserad. Det är ju min personliga hållning alltså att
154 den här preventiva effekten kan vara positiv.

155
156 **I2** - Man kan säga även där då att PTS har en ganska pragmatisk inställning till regleringen?
157

158 **R** - Ja, ja det tycker jag man kan säga. Det tycker inte jag är för mycket att säga. Alltså under
159 arbetsgång nu ska jag säga att regleringsarbete såhär själva det etablerade regelverket det inte är
160 helt klart ännu. I förordningen framgår det att BEREC, det här samarbetsorganet för
161 regleringsmyndigheter i Europa, BEREC ska ta fram riktlinjer alltså tillämpningen av denna
162 förordning. De ska underlätta tillämpningen. Det är ett arbete som pågår just nu. Och då är det
163 väl så att PTS har en mera pragmatisk linje och lite enkelt uttryckt man vill ha en pragmatisk
164 linje och tillämpningsbara regler som inte är mera detaljerade än att regleringsmyndigheterna
165 kan använda dom på ett vettigt sätt. Blir texten för detaljstyrd då kanske man kommer försöka
166 ”runda” det för att det är för svårt att tillämpa exempelvis.

167
168 De ska skapa ett harmoniseringsverktyg som ska ha till uppgift att harmoniserade de olika
169 medlemsländerna agerade på denna marknad. Om det är för detaljerat så leder det ej till
170 harmonisering så blir det för det för svårt att tillämpa. Det ska vara en lämplig pragmatisk nivå
171 på det, så kan man väl säga. Det kommande dokumentet är något att hålla ögonen på. För det
172 kommer antagligen lite mera i detalj visa hur man kan tänka i förhållande till de här reglerna.
173 Hur ska man resonera och vilka bedömningar kommer man att göra.

174
175 **I2** - Hur ser kommunikationen ut mellan PTS och olika företag/organisationer ut?
176

177 **R** - Det har kommit frågor det var ganska mycket under förra veckan. Vid lanseringen av zero-
178 rating, då bubblade upp ganska mycket. Det var en site som gjort ett automatiskt genererat
179 formulär; skriv till PTS och klagade om du ogillar detta. Det blev stor volym med likartade
180 meddelanden.

181
182 Generellt sätt så är det väl så, att frågan om nätneutralitet är väldigt engagerande och de ser att
183 det finns olika kopplingar i detta. Det ena handlar om konsumenträttigheter så att säga., den
184 enskildes rätt att kunna informera sig osv. Sen finns det dom som är lite mera integritets
185 inriktade i detta, de menar att det inskränker användarens rätt att vara skyddad ur ett
186 integritetshänseende. Så finns det förstås it företag och sådär som också kontakt oss och säger;
187 hur tror ni att det här kommer att påverka marknaden? Det finns olika infallsvinklar på det här,
188 alla är viktiga, men det är väldigt olika. Det generella problem som jag ser är att man tror inte
189 riktigt på vad reglerna ger för möjligheter alltså man hänvisar till ett regelverk som inte adekvat
190 för i förhållande till hur regelverket är utformat. Så det är väl problemet att det här
191 regleringstexterna är lite svår genomträngliga så man har svår att sätta sig in i vad PTS faktiskt
192 kan göra och inte kan göra eller vad PTS ska göra. Mera känslor som rörs upp än att det är
193 sakligt. Men det är absolut så att det är ögon på dessa grejor, inte minst pga. att regelverket
194 började tillämpas 30/4-16.

195
196 **I** - Har du några andra generella tankar om nätneutralitet som du tycker vi ska belysa? Eller om
197 du känner att du missat något.

198
199 **R** – Är ni i uppstartsfasen av ert arbete?

200
201 **I** – Vi är ungefär i mitten. Vi har upplevt att det har varit svårt att få företag att prata om detta
202 ämne, både ISPs och content providers. Att de inte riktigt velat ta i ämnet. Vi har haft lite andra
203 frågor till dom, som har varit mera riktade till ISPs och CPs. Tagit lång tid att etablera kontakter
204 och vissa har inte velat svara alls och de flesta har gett svar som går i linje med de nya
205 regelverket. Det är en väldigt het fråga, som nog har gjort det till ett känsligare ämne. Företagen
206 vill inte förknippas med något negativt.

207
208 **R** - Det är nog så att om man tänker på aktörerna på marknaden, till att börja med, så har ni
209 bedrivit ert arbete innan hela regelverket kommit ut. Visserligen så har förordningen börjat
210 tillämpas den siste april, men vi har fortfarande kvar att ta hänsyn till BERECs kommande
211 riktlinjer. Aktörerna på marknaden vet ju inte riktigt hur PTS kommer att förhålla sig till detta.
212 Och sen är det också en väldigt stark medial bevakning på detta. Det känner aktörerna av, det
213 påverkar även dom.

214
215 Tyvärr har jag inte så svårt att förstå att de är känsligt. Egentligen är det känsligt för mig och
216 PTS också att uttala mig. Men jag känner att i detta syfte är det helt ok. Och att vi faktiskt har
217 fått ett regelverk på plats. Så man vet lite mer hur man kan kommunicera då. BERECs riktlinjer
218 ska vara klara den 30:e augusti.

219
220 **I2** - De här riktlinjerna, om man tänker på aktörerna på marknaden, finns det något aktivt
221 intresse där eller är de mera passiva?

222
223 **R** - Det är ett politiskt dokument, så Google och liknande får inte lägga sig i bara för de vill,
224 utan det är en beredning som sker. Det ska göras av de som representerar respektive
225 regleringsmyndighet i BEREC.

226 **I** – Tack för samtalet.

Comhem

Date: 2016-05-04

1 Interviewer = **I**

2 Recipient = **R**

3

4 **I** - Hur ställer sig Comhem i frågan om nätneutralitet?

5

6 **R** - Vi säger så här om man ska ha en grundläggande högtravande inledning och säga från vårt
7 perspektiv så är det viktigare att vi har ett internet som får fortsätta att växa och vara så öppet
8 som det bara går. Så jag menar att principiellt så är Comhem emot alla former av begränsning
9 av det öppna internet överhuvudtaget, förutom när det gäller allvarliga brott, t.ex. för
10 barnpornografi så finns en överenskommelse med polismyndigheten där vi blockerar sådan
11 sidor. Men principiellt sett så tillämpar vi inga blockeringar av sidor och vi behandlar alla IP-
12 paket lika vid normal belastning. Alla innehållsleverantörer har samma villkor och relation till
13 oss. Så om man tittar på vår verksamhet idag så tillämpar vi den grundläggande nätneutraliteten.
14 Men däremot, det vi alltid brukar skjuta in med den utgångspunkten, det är centralt för oss att
15 fortsättningsvis kunna erbjuda en tjänst som är optimal för våra kunder. I vissa fall, i synnerhet
16 vid belastningstoppar, så måste vi kunna trafikprioritera.

17

18 **I** - Som en fredagskväll. Prioriterar man då viss videoströmning?

19

20 **R** - Ja, exakt. Man tittar på de tjänster, i synnerhet videotjänster som är känsliga för fördröjning
21 helt enkelt. Dom blir ofta prioriterade, för att kunder ska kunna få så bra upplevelse som möjligt.
22 Det görs också en avvägning av vilka tjänster som behöver prioriteras vid samma tillfälle. Det
23 är de tjänster där kunder inte märker av en fördröjning av data paketet och som inte är
24 realtidsberoende. Det är det enda undantag vi gör. Så att återigen så absolut så tillämpar vi en
25 nätneutralitet men just under vissa belastningstoppar gör vi vissa undantag. Om man tittar på
26 våra kunder i dag så kan de nå alla tjänster alla appar osv på hemsidor och på nätet. Det finns
27 inga begränsningar.

28

29 **I** - Du har svarat på om du behandlar alla kommunikation lika. Och du behandlar alla paket lika,
30 era och t.ex. en innehållsleverantör?

31

32 **R** - Ja, det skulle jag säga att det är. Det är ingen skillnad i sak. Så vet man inte hur det blir
33 långsiktigt vi har ju en växande OTT (over the top) alltså en huvud topp marknad då med Netflix
34 och andra aktörer. Som ju kommer att ta en allt större del av nätet. Tillslut kan det landa i en
35 diskussion kring om det tar väldigt mkt utrymme. Hur påverkar det våra tjänster och hur
36 påverkar det kvalitén på de bredbandserbjudanden som vi har. Men den diskussionen är inte på
37 började än, kanske på sikt kan det bli aktuellt med en sådan.

38

39 **I** - Diskuteras frågan om nätneutralitet mellan er operatörer?

40

41 **R** - Nej egentligen inte. Vi har ingen löpande diskussion mellan oss och andra operatörer. Det
42 enda som har varit branschgemensamt är de diskussioner som har initierats av PTS egentligen.

43

44 <kontakten försvinner här några få sekunder>

45

46 **R** - Man började diskutera lagstiftningen på europeisk nivå. Det vill säga den lagstiftningen
47 som nu har trätt i kraft. Då hade vi principiella diskussion kring hur man skulle se på det från
48 ett svenskt perspektiv och liknade. Men det har varit en ganska avsmnad plattform egentligen
49 inte de senaste åren varit det några som helst aktivitet.

50

51 Vi delar PTS och näringsdepartementets syn på den här frågan. Det grundläggande problemet
52 är om vi har en dåligt fungerade konkurrens på marknaden, d.v.s. om du har två nätägare och
53 två tjänsteleverantörer osv. Då kan nätneutralitet bli ett problem. Så länge kunden kan rösta
54 med fötterna och välja leverantörer som inte begränsar på olika sätt då har vi inga problem. För
55 då kommer marknaden att bli självregleraden och det tycker vi är väldigt naturligt att man har
56 det förhållningssättet.

57

58 Vi har alltid varit kritiska till att man ska lagstifta inom området, vi anser att lagstiftningen ska
59 ju bara behövas när det finns ett problem att lösa. Och med tanke på att vi inte historiskt har
60 sett den typen av problem just med tanke på att vi har en sådan välfungerande marknad. Då
61 behövs det helt enkelt inte. Nu kan vi se att vi landade i alla fall i den här förordningen på EU
62 nivå.

63

64 Så läge vi får möjlighet att tillhandahålla en bra tjänst så tycker vi det är ok. Då handlar det
65 mycket om det enda problemet som kan uppstå nu det är hur regelverket kommer att tillämpas.
66 PTS kollar ju nu på Tre och Telias zero-rating erbjudanden. Och så vet vi att BEREC kommer
67 att komma ut med guidelines efter sommaren. Då får vi se hur de ställer sig till detta här.

68

69 **I** - Vi har snuddat vid det. Hur ser det ut med påtryckare från ex innehållsleverantörer? Har ni
70 märkt av något sådant? Pratas det om det?

71

72 **R** - Nej vad jag vet. Och det kan bero på okunskap från min sida. Måste jag då kolla med mina
73 tekniker. Men jag borde ha varit medveten om det.

74

75 **I** - Hur är Comhems syn på trenden zero-rating?

76

77 **R** - För det första att kalla det för trend är ett starkt ord. Nu har vi sett två operatörer. Det kan
78 man ju ha synpunkter på. Vilken inte bara är min syn, om du såg debatt artikeln från igår. Den
79 var väldigt omfattande. Så det är klar vi kan diskutera den saken från ett policy perspektiv så
80 att säga. Ja skulle säga såhär att vi har inga synpunkter på det. Det handlar nu om hur framför
81 allt PTS ser på det här. Det är ju PTS som kommer att avgöra vart gränserna går och hur
82 lagstiftningen är helt enkelt. Jag skulle tro att det ska mycket till för att PTS skulle fälla dom
83 två aktörerna med tanke på det förhållningsätt som har haft historiskt i frågan. Men vi får se.

84

85 **I** - Har ni några andra tankar kring nätneutralitet?

86

87 **R** - Hur ser framtiden ut för Sverige med nätneutralitet? Vi kan inte se några direkta problem
88 kopplat till det. Det beror återigen på det rådande konkurrensläget på marknaden. Återigen så
89 går det ju att diskutera på sikt effekten av prioriteringar som vi vill göra. Men nyckeln är
90 återigen konkurrens och att kunderna kan välja operatör eller snarare välja bort operatörer som

91 blockerar tjänster. Återigen internetanvändningen är ett rörligt mål, det rör sig hela tiden. Vi
92 kommer med all sannolikhet se att over the top tjänster kommer ta allt större plats på lite olika
93 sätt. Jag tror att frågan kommer hamna i ett annat ljus om ett par tre år. Vi får återkomma.
94
95 **I** – Tack för intervjun.

A.3 Survey

To get a general feeling about the knowledge of net neutrality we conducted a small survey, of which the result are presented here.

Table A.3.1.

Sex		
Male	55.9%	81
Female	43.4%	63
Other	0.7%	1

Table A.3.2.

Age		
0-15	0%	0
16-30	56.6%	82
31-65	41.4%	60
65+	2.1%	3

Table A.3.3.

Net neutrality awareness		
Yes	42.8%	62
No	57.2%	83

Table A.3.4.

Belief of net neutrality as a real issue		
Yes	52.4%	76
No	13.8%	20
Don't know	33.8%	49

The survey was conducted by using Google Forms. The form was shared on different social media platforms, was encouraged to share, and generated 145 responses. The results is not used in our empirical findings, but is used in the introduction to give a general picture of net neutrality awareness.

A.4 Attached documents

A.4.1 Net neutrality and open internet – Tele2 Sweden's view

Tele2's definition of net neutrality/open internet

"Net neutrality" and "open internet" are often viewed as synonyms and Tele2 will below use the term "open internet", when referring to both of these concepts, since Tele2 is of the opinion that the term "open internet" gives a better understanding of what the ultimate objective with the "net neutrality"-concept really is.

The objective of the open internet is to contribute to preserving the internet as a common communication network for world society. Tele2 Sverige AB ("Tele2") is of the opinion that the open internet can be defined as follows:

"An open internet (i.e. net neutrality) is when customers can make their own choices about what applications and services to use and are free to decide what lawful content they want to access, create, or share with others".

An open internet, as defined above, promotes freedom of expression and competition and enables investment and innovation to the benefit of customers. Tele2 therefore fully supports an open internet.

Corner stones in an open internet

According to Tele2, an open internet is based on three corner stones:

1. *No blocking.* There shall in the entire value chain not be any blocking of lawful content, applications, services, non-harmful devices or networks.
2. *No unreasonable discrimination.* There shall in the entire value chain not be any unreasonable discrimination when lawful network traffic is being transmitted.
3. *Transparency.* All parties in the value chain shall be transparent and disclose the network and service management practices, performance characteristics, and terms and conditions of their respective services.

Tele2 believes these three corner stones, applied with the complementary principle of reasonable network and service management and the possibility to offer specialized services as outlined below, will empower and protect customers and innovators while helping ensure that the internet continues to be open and flourish, with robust private investment and rapid innovation at both the core and the edge of the network.

It shall hence be noted that Tele2 is of the opinion that if an open internet, as defined above, shall be available to the customers each part of the entire value chain, e.g. network operators, content providers and device providers need to act in accordance with the three corner stones. Network operators control the access to the networks used by the customers, content providers control the access to the content used by the customers and device providers to some extent

both control the customers' access to the network providers' networks and the content providers' content. A true open internet, i.e. an internet where customers can make their own choices about what applications and services to use and are free to decide what lawful content they want to access, create, or share with others, can only be achieved if all parties in the value chain act according to the three corner stones.

Tele2 is of the opinion that the net neutrality-debate up until today has been too focused on the network-part of the value chain, while the business practice of content and device providers more or less have been left outside the scope of the discussions. This risk leading to a situation where network providers on their side act according to the corner stones set out above, while content and device providers may on their side hamper the possibilities for an open internet. If a Swedish "industry standard" on the net neutrality-area shall be able to meet the objectives of an open internet, Tele2 therefore is of the opinion that the standard not only need to include undertakings from the network providers but also the same undertakings from content- and device providers, i.e. all these providers need to undertake and act according to the three corner stones outlined above.

Some specifics regarding traffic management

As set out above Tele2 is of the opinion that one essential corner stone in an open internet is that there shall not be any unreasonable discrimination when lawful network traffic is being transmitted. Tele2's firm view is that an adequate usage of traffic management may not be considered an "unreasonable discrimination". With traffic management Tele2 e.g. means that providers a) implement a legislative provision or a court order, b) prevent the transmission of unsolicited communications, or, within the framework of parental control, age-inappropriate content, to end-users who have in advance been provided with clear information about the restrictive measures, c) ensure the good functioning of their network and/or services, d) preserve the integrity and security of the network, services and/or devices and/or e) minimize the effects of network congestion.

Traffic management is necessary in order to be able to provide customers with a continuously satisfactory experience when using their services. It may for example in a congested network be necessary to prioritize real time applications (such as e.g. voice-calls) over other non-real time-applications (such as e.g. peer to peer traffic) in order to be able to at all times provide customers with satisfactory services. For certain services, such as e.g. Voice over LTE (VoLTE), such prioritizations are also included as part of the industry standards.

As set out above Tele2 is of the view that all parties in the value chain shall be transparent and disclose the network and service management practices, performance characteristics, and terms and conditions of their services, i.e. the traffic management practice used by the service providers shall be fully transparent towards the customers. By providing this type of information to the customers in a transparent manner customers will have the opportunity to compare the different service providers' offerings also in terms of traffic management (if this is of importance to the customers).

Some specifics regarding specialized services

Tele2 is in addition to what has been set out above regarding traffic management of the firm opinion that a party providing "specialized services" shall not be considered to "unreasonably

discriminate lawful network traffic". With specialized services Tele2 means "services provided by means of electronic communications that is optimized for specific content, applications or services, or a combination thereof, offering enhanced quality".

It is according to Tele2 vital for the entire sector and its customers that parties providing electronic communication services are entitled to differentiate their offerings also in terms of quality of service. This will benefit the customers since it will foster innovation and lead to a broad range of product offerings available to the customers. The possibility to offer specialized services will most likely also be necessary in order to be able to meet all sorts of future customer demands (as an example real time e-health-applications will by necessity need to be offered as a specialized service).

However, in order to preserve the open internet, as defined above, specialized services shall only be offered to an extent that does not jeopardize the possibilities for customers to make their own choices about what applications and services to use and are free to decide what lawful content they want to access, create, or share with others. This for example means that network operators shall only provide specialized services to such extent that sufficient network capacity is generally available also for the best-effort internet access services, i.e. the general user experience shall be preserved also when specialized services are being offered.

Some specifics regarding data protection regulations

One essential element of an open internet, which has not been mentioned above, is that customer at all times shall be informed on how their personal-, location- and traffic data is being managed by their network, service and device providers. This will build trust when the open internet is being used, which in itself will contribute to the further development of the open internet.

In order for customers to be able to know what sort of protection their data are under, the same sort of data protection regulation of course needs to apply to all sorts of services, i.e. independent of whether it e.g. is a traditional mobile phone service or an OTT-service. This applies both in terms of "pure" data protection regulations but also in terms of legal intercept and data retention obligations. The regulatory requirements within these fields differs a lot today dependent of whether you provide a traditional mobile service or an OTT-service, which makes it hard for customers to know what sort of protection their data actually is under when using different sorts of services. This for sure does not contribute to the open internet but rather hampers it. One solution to this problem could be that OTT-providers as part of a Swedish industry standard undertake to voluntary act according to the stricter privacy regulations that apply to the market players falling under the scope of the e-privacy-directive.

An open internet, as defined above, promotes freedom of expression and competition and enables investment and innovation to the benefit of customers. Tele2 therefore fully supports an open internet.

Stockholm 2014-11-04
Thomas Ekman
CEO
Tele2 Sverige AB

A.4.2 Värna den fria virtuella rörligheten i Europa – stöd nätneutraliteten.

Internet är en av det moderna samhällets grundpelare. Medborgare har utrustats med nya redskap som fått stor betydelse för hur vi lever i dag. Sverige har varit ett av de ledande länderna i digitaliseringen av Europa. Förutsättningen för utvecklingen har i hög grad varit internetns öppna karaktär. Vi mediebolag har alltid varit anhängare av ett starkt, öppet och fritt internet, och har bidragit till att internet har den roll som det har idag.

Under de senaste åren har vi runt om i världen sett en utveckling mot ett mindre fritt internet, på flera plan. En central fråga i sammanhanget är de ökade hoten om prioritering av olika sorters trafik på internet. Vi ser en reell risk att telekombolag stryper eller nedgraderar kvaliteten hos tjänster som konkurrerar med telekombolagens egna, eller de tjänster som telekomoperatören mot betalning väljer att samarbeta med. Det försvårar för andra aktörer att nå ut med sitt innehåll och försämrar konsumenternas valmöjligheter.

Vi har tidigare sett exempel på när telekombolag hindrat konkurrerande aktörer på telefoniområdet. Svenska operatörer har uttryckt intresse för att i högre grad kunna styra och prioritera trafiken i de nät som vi alla använder för att sprida innehåll, i synnerhet trafik från mediebolagen. Vi vet också att det pågår en rörelse mot ökad konsolidering i branschen som snabbt kan minska den konkurrens som tidigare verkat tillbakahållande.

Mediebolagen spelar en stor roll för demokratin och kulturen i Sverige. Om nätneutraliteten urholkas i Sverige så kommer det att slå mot möjligheterna att nå ut med svenskt innehåll. Sveriges innovativa digitala industri riskeras, då små bolag får en kraftig konkurrensnackdel gentemot de större etablerade aktörerna och telekombolagens egna tjänster. Stora, internationella aktörer som Netflix och Youtube klarar sig. Men inte svenska aktörer som är de mest utsatta för operatörernas påtryckningar.

Utvecklingen drabbar även konsumenterna, som många gånger har svårt att veta huruvida telekombolagen håller vad de lovar när det gäller leveranssäkerhet, tjänstekvalitet och garanterad hastighet. Konsumenterna måste garanteras lika villkor för alla former av innehåll.

Det finns nu en möjlighet att i samband med behandlingen av EU-kommissionens förslag på telekomområdet säkra internetns öppenhet för framtiden. Det handlar om förslagen om en miniminivå av nätneutralitet på Europeanivå. Nätneutraliteten har mycket gemensamt med grundläggande rättigheter. Det finns därför starka skäl att värna denna på Europeanivå och inte bara inom respektive medlemsstat. En harmoniserad basreglering värnar medborgarna/konsumenterna och de nationella mediebolagen, samtidigt som telekomoperatörerna garanteras jämförbara regelverk i olika medlemsstater.

Vi delar därför de grundtankar om ett öppet internet som läggs fram i kommissionens förslag, och som sedan utvecklats i diskussionerna i parlamentet och rådet. Vi uppmanar regeringen att i de pågående rådsförhandlingarna stödja starka och tydliga skrivningar som garanterar att nätneutralitet och icke-diskriminering gäller som huvudprincip.

Vi ser det som särskilt viktigt att Sverige verkar för en reglering som:

- Slår fast principen att diskriminering av specifikt innehåll är förbjuden så länge innehållet är lagligt. Detta är avgörande för att undvika en situation där nätoperatörer diskriminerar vissa erbjudanden om innehåll, exempelvis som konkurrerar med deras egna tjänster. Diskriminering riskerar i förlängningen att medföra inskränkningar av mediemångfalden och yttrandefriheten. Av detta följer även att möjligheterna till trafikprioritering på det öppna internet bör vara klart definierade och begränsas till ett fåtal specifika situationer. (Se förslagen kring art 23 §2 och 5)
- Gynnar innovation och konkurrens. Internet är ett komplext ekosystem men det är just öppenheten i nätverken som har skapat konkurrens, innovation och valfrihet för konsumenterna. Vi ser behovet av skrivningar som säkrar att mediebolag och andras tjänster inte blockeras och stryps. Det ökar incitamenten att investera i kreativt svenskt och europeiskt innehåll och nya medietjänster. Alternativet kan vara en utveckling där stora, företrädesvis amerikanska, aktörer ges än större möjlighet att genom exklusiva, lukrativa avtal i praktiken skaffa företräde för sina tjänster i internettrafiken – eller ytterst till och med stoppa konkurrerande aktörer. (Se framför allt art 23, §5)
- Tillåter specialiserade tjänster, dvs.t.ex. IP-TV, att fortsätta att utvecklas parallellt med ett stabilt, öppet internet. Genom en åtskillnad tjänsterna emellan värnas konsumenten samtidigt som innovationen inte hämmas. Vi ser behovet av specialiserade tjänster med prioriterad trafik vid sidan om det öppna internet – men tjänsterna bör vara tydligt definierade och betraktas separat. (Se i synnerhet förslagen kring Art 2, §2, p 14-15)
- Slår fast principen att specialiserade tjänster inte får försämra kvaliteten på öppna internet-tjänster. Nationella tillsynsmyndigheter ska även kunna granska utvecklingen och vidta lämpliga åtgärder när kvaliteten på det öppna Internet är i fara. Regleringen bör garantera att det öppna Internet fortsatt utgör normen, och inte blir ett undantag. (See i synnerhet Art 23, §2)
- Underlättar välgrundade val av konsumenterna. Detta genom att särskilda skyldigheter införs som ger dem tillgång till nödvändig information om Internets kvalitet och hastighet samt avtalsvillkor som rör deras Internetabonnemang. Även om förbättringar här skett i Sverige är situationen fortfarande inte oproblematiske. Rådet bör även överväga om transparenskraven kan stärkas ytterligare. (Förslagen kring art 20-21, direktiv 2002/22/EC)

Sverige är världsledande inte bara inom telekom utan också när det gäller utveckling av nya medietjänster och kreativt innehåll på nätet. Det är viktigt att den utvecklingen kan fortsätta, inte minst för att få fler jobb i växande företag.

Med tanke på de senaste årens utveckling menar vi att ett tydligt regelverk på området hastar. Om internet alltmer stängs in kommer det att vara oerhört svårt att återskapa öppenheten. Ytterst handlar det om vem som ska styra vilket innehåll som sänds i näten:

Användarna och innehållsföretagen eller telekomoperatörerna.

Stockholm 2014-10-23

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