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## International Journal of Industrial Organization

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# The exclusion of competing one-way essential complements: Implications for net neutrality<sup>☆</sup>



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### ARTICLE INFO

#### *Article history:*

Received 28 January 2015

Revised 13 March 2017

Accepted 19 March 2017

Available online 23 March 2017

#### *JEL Classification:*

L12

L13

L51

L96

#### *Keywords:*

Net neutrality

Foreclosure

One-way essential complements

### ABSTRACT

We analyze the incentives of internet service providers (ISPs) to break net neutrality by excluding competing one-way essential complements, i.e. internet applications competing with their own products. A typical example is the exclusion of VoIP applications by telecom companies offering internet and voice services. A monopoly ISP may want to exclude a competing internet app if it is of inferior quality and the ISP cannot ask for a surcharge for its use. Competition between ISPs never leads to full app exclusion but it may lead to a fragmented internet where only one ISP offers the application. We show that, both in monopoly and duopoly, prohibiting the exclusion of the app and surcharges for its use does not always improve welfare.

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<sup>☆</sup> We thank participants at CISS, Connected Life 2014, the 18th Centre for Competition and Regulatory Policy Workshop, the 29th Jornadas de Economía Industrial, the EARIE meeting and the Ninth IDEI-TSE-IAST conference on the Economics of Intellectual Property, Software and the Internet. We also thank Juan José Ganuza, Jacques Crémer, Martin Peitz and Nicolas Petit for helpful discussions and, more particularly, Florian Schuett who discussed the paper twice. We are also grateful to the co-editor (Martin Peitz) and two reviewers for their helpful comments and suggestions. We thank Isabelle Peere for proofreading the manuscript. This research was funded through the ARC grant for Concerted Research Actions, financed by the French-speaking Community of Belgium.

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## 1. Introduction

In 2005, Madison River, a US internet service provider (ISP), excluded Vonage, a Voice over IP (VoIP) application, from its network, which resulted in a conflict between stakeholders over the control of the bundle of services offered on the internet. Most ISPs offer multiple services –internet, phone, television, video, etc.– and applications such as Vonage are competing with these services. These apps are “competing one-way essential complements” (Chen and Nalebuff, 2006): competing because Vonage is a substitute to the phone, and one-way essential complement because the internet is “essential” for the app to work but the opposite is not true. On the one hand, they create a business stealing effect and excluding them is a way for the ISP to limit unwanted competition. On the other hand, they create value for internet users who are willing to use and to pay for these new services. That value can possibly be extracted by the ISP through higher internet prices and, therefore, exclusion might not necessarily be optimal. The interplay of these two types of incentives is the main object of this article.

The concept of exclusion rings multiple bells. In this paper, we link the literature on vertical foreclosure and one-way essential complements with the literature on net neutrality. Indeed, the exclusion of competing applications is part of the larger debate on “net neutrality”. Because it is still a very lively dispute, net neutrality does not have a unified definition. Still, Schuett (2010) summarizes it as “the principle that all data packets on an information network are treated equally”. Accordingly, content exclusion is a breach of the net neutrality principle. The literature (Choi and Kim, 2010; Economides and Hermalin, 2012; Reggiani and Valletti, 2016, for instance) has generally focused on two implications of net neutrality: the **non-discrimination rule** and the **zero-price rule**.

The first interpretation simply means that a bit is a bit and that contents should be treated similarly, regardless of their nature, origin and destination. For example, there should be no prioritization: the bits sent by Youtube should not be transferred faster than those sent by Vimeo. Similarly, traffic management should be limited to isolated cases and the exclusion of particular applications –the most extreme form of discrimination– should be forbidden. Furthermore, the non-discrimination rule also implies that internet users can use applications without paying an extra fee to the ISP. Stated differently, the ISP cannot condition the use of an application to the payment of a surcharge. The non-discrimination rule prohibits the exclusion of competing apps (content-based discrimination, which we henceforth refer to as condition NN<sub>1</sub>) and price surcharges for using such apps (financial discrimination, condition NN<sub>2</sub>). We say that an ISP fully complies with net neutrality if there is no exclusion of the app and no surcharge to use it. An ISP partially complies with net neutrality if there is no exclusion but a surcharge to use the app.<sup>1</sup>

<sup>1</sup> This distinction echoes that between weak and strong net neutrality of Gans (2015) and Gans and Katz (2016) who state that net neutrality is *strong* if content-based price discrimination is outlawed both with regard to CPs and consumers, and that it is *weak* if discrimination is outlawed with regard to one group only.

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