Impacts of Virtualisation on the Routing

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Virtualisation is both a research direction and network reality today. Most businesses use IP-based virtual private networks, and there are products that provide both lowerlayer (such as Virtual Private LAN Services) and higher layer (such as virtual hosting) services. Recent research efforts on network virtualization have been motivated both by a desire enable large scale experimentation using shared infrastructure, and by concerns that the Internet architecture may be at an impasse. In general, the research approaches aim to provide a more comprehensive, better architected support for virtualisation.

The business reasons for virtualisation include pluralism, isolation, customisation, and amortisation. Pluralism allows a multitude of different architectures and services to be provided over a single physical infrastructure, thereby both allowing the providers to better meet the potential demand and the research community to more easily study new, radical architectures and approaches. Isolation makes sure that mutually competing users and usage patterns do not disturb each other. Virtualisation provides better security and resource control. Customisation refers to a less extreme form of pluralism where an essentially same architecture or service is provided in slightly different forms, perhaps in a differently parameterised form, to different users. Finally, amortisation refers to the flip side of pluralism and customisation. Virtualisation allows a single set of infrastructure components to be used for a multitude of different purposes, thereby allowing a single investment to be amortised over a number of services or usages.

However, pluralism and isolation will influence the routing and thus raise new issues that will require the development of new strategies. The technical talk will enumerate these issues and the new research directions that virtualisation will foster in the routing area.