

Firewalls and their Impact on Multimedia Systems

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Internet Development, Multimedia, Security and Firewalls - what is the situation

If we consider the current development of multimedia and that of applications in areas such as business or commerce, and if we look at the diversity of people and institutions using them, we are facing a very challenging situation. The Internet as an open network becomes part of our business and social life. It seems obvious that to ensure security is a must. The concept of „Information Security“ and its implications have a very different meaning for different users though.

As an example - people from the research community are using multicast multimedia conferences as a simple ad-hoc means of easily communicating with each other. They are usually tolerating the absence of dedicated security features. The same does not at all apply to the potential users of IP telephony as a regular commercial service. Even if it would be „privacy-enabled“ and IP telephony convinces your department managers to deploy it - it is uncertain whether they are willing to open holes in the firewalls if this is a necessary short-term prerequisite for operation. Additionally we need to weigh security mechanisms and their consequences against providing the desired realtime performance and resource allocation for multimedia datastreams - an aspect which is usually summarized by the term Quality of Service (QoS).

One aspect to concern - close interaction between Firewall-, VPN- and QoS-mechanisms

Security includes the certainty of privacy and message integrity as well as authentication of communicating partners, and the protection of administrative or physical domains. In the same way that the use of multimedia applications is a subset of the potential internet use, firewalls are a subset of all the available security mechanisms and can not be expected to solve all security problems. In the past years they have often been looked upon as more or less fixed components that set the rules for other applications or practices.

Using them in multimedia communication scenarios raises a number of new questions. Two of those are listed below:

- (How) do firewalls (have to) interact with mechanisms requesting, triggering or providing QoS guarantees ?
- Are there special implications that result from or may influence the usage of existing or emerging Virtual Private Network (VPN) mechanisms ?

The transmission of continuous media in most cases requires a guaranteed quality that can be expressed in terms of bandwidth demand or delay time. To meet these requirements at the network level, protocols for explicitly or implicitly reserving resources (IntServ approach) or an individual and preferred forwarding of certain dataflows (DiffServ approach) are used. A firewall as a network element should actively take part in resource reservation or should provide means for supporting the individual handling of data flows when using the DiffServ approach.

Though the deployment and usage of IPSec is expected to solve some of the security problems it will also raise new ones. A number of emerging QoS mechanisms that rely on the on-the-fly evaluation of the packets' data payload for making their decisions will fail, if this payload is encrypted and therefore hidden to all but the end system nodes.

From my position one answer to the questions raised above is: Due to the complex interaction of different components in a network, firewalls should be reflected upon as an integral part of a comprehensive service infrastructure. An architecture of interoperating distributed, extensible and exchangeable firewall components may form a framework for the desired development, evaluation and deployment of security mechanisms with appropriate multimedia support. Our and other example concepts and components will be discussed and judged at the panel.

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