Multicast IPv6 for news distribution

Universities need to advertise a lot of news and messages every day: re-scheduling of lessons, exams cancelled, lessons moved to different rooms, last-minute lectures or special events etc. Nowadays, the most used technology for news delivering is surely e-mail, even if RSS feeds are a valid alternative. However, both this solutions are not bandwidth efficient, since they introduce a lot of redundant traffic in the network. Here we proposed a novel and lightweight solution for local news distribution based on IPv6 multicast.

Description

Universities need to advertise a lot of news and messages every day: re-scheduling of lessons, exams cancelled, lessons moved to different rooms, last-minute lectures or special events etc.

The most used system nowadays is surely e-mail: quite all students have free Internet access inside the campus and a mailbox provided by the university itself. To be more precise, since not all students and professors are interested in any news, mailing-lists are used. For example, a list for each course is useful to send a message to all the student attending them. Furthermore, other specific mailing-lists are usually introduced: a list for foreign students, additional lists for Ph.D. student / researchers / professors of department X or faculty Y, another for those interested in a specific topic and which would like to know when a visiting professor or an expert will deliver a lecture etc.

But mailing-lists are not bandwidth saving: a single message could be downloaded by tens or thousands of users. Thus, a few messages usually generates a notable amount of traffic. In addition, a mailing-list system requires periodical maintenance in order to protect users' privacy - if an attacker violates the system, he could easily obtain the e-mail addresses of all the subscribed students and professors.

RSS feeds are a newer and more efficient solution for news distribution. Users can easily subscribe to the desired feeds and the periodically check for news. However neither this approach is network-friendly: the same feeds would be downloaded by all the subscribers, even if a caching system (if present) could mitigate somehow the problem.

The right approach would be instead a IPv6 multicast-based one: all the users interested in a specific topic join to a IPv6 multicast group and the news server sends messages to this group. Such a solution could be easily implemented, since it can be seen as a "reversed-RSS" or "push-RSS": each group has it own IPv6 multicast address and the application listen on the desired addresses, waiting for messages and showing an alert when news arrive. Moreover, there is not a centralized server which is responsible for maintaining the various lists of users and for dispatching messages: instead, like in traditional RSS feeds, each client chooses which kind of news it wants to receive.

Problems could arise if a node is not connected to the university network when the message is sent: however, the message server could simply re-send the news feed periodically (for example every hour). Obviously the application will show only new messages added after the last reception.

Since such a solution would need only a simple software application (for example written in Java) and an IPv6 enabled device, virtually every PC, laptop, netbook, PDA and even phone could receive news when connected to the campus network.

It is important to note that the messages is sent only once and received by all the users at the same time: therefore, the generated traffic is extremely limited.

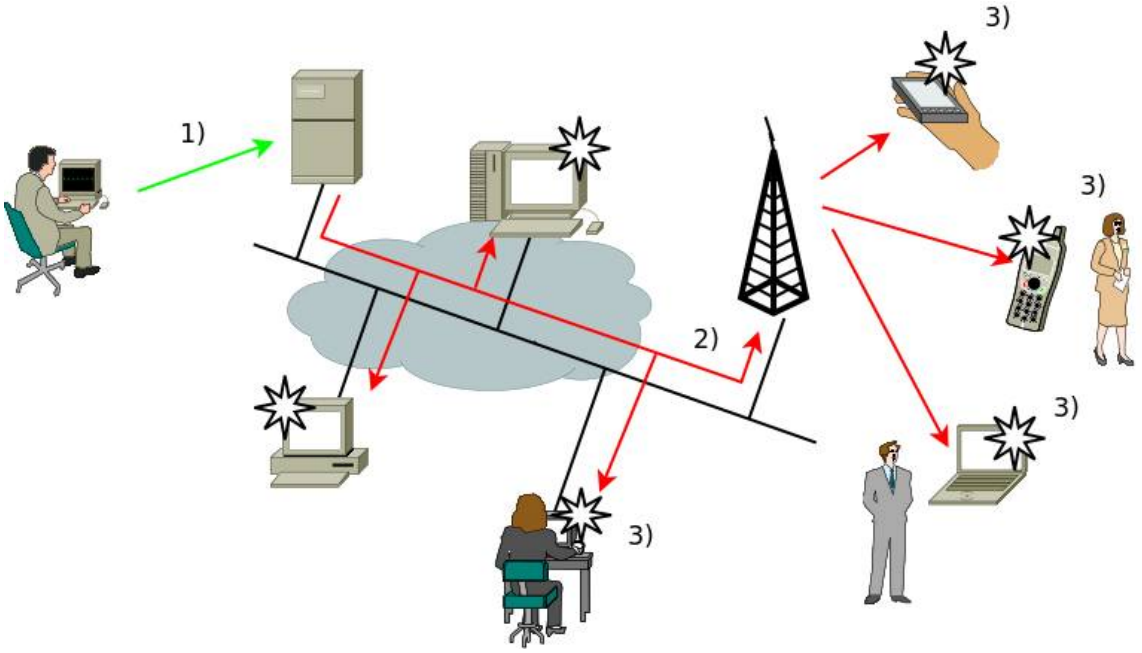

Figure 1. The administrator publish a news on the server (1) and the message is then sent to the appropriate IPv6 multicast group (2); when the devices joined to the group receive the updated feed, an alert is shown and users are quickly informed.