VoIP Signalling Gateway with Resource Reservation Support

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Nowadays Voice over IP technologies are getting more popular than ever. Fundamentally there are two VoIP signaling protocols, which are widespread in the world: the Session Initiation Protocol supported by the IETF, and H.323 protocol family standardised by the ITU. SIP is a very simple text based protocol, it is responsible for setting up, managing and tearing down multimedia sessions. The H.323 is a more complex binary coded protocol, capable of establishing conferencing sessions on any packet based network. With the help of these protocols we can introduce advanced services in our network.

Telephone networks supporting these two protocols have been around for a while. Most of the large companies have already deployed their own networks to handle local calls. In these cases data and voice traffic share the same physical network, thus it is irrelevant to build a new cable network, so the company can save costs. In such a hybrid network we can easily imagine a situation where data traffic grows suddenly, taking bandwidth from the audio flows, which would result in decreasing voice quality, or even dropped calls.

Reservation of the network resources is one of the possible solutions for the problem. A suitable protocol is the Resource Reservation Protocol (RSVP), by which we can acquire different quality of service for different calls.

Signalling gateways are responsible for inter-working of networks with different signalling protocols, by transparently converting the signalling messages, thus making it possible to establish a call between a SIP and H.323 endpoints, so that the endpoints do not notice anything of the fact that the other endpoint uses a different protocol.

I've designed and built a gateway, which converts SIP and H.323 signalling messages besides supporting resource reservation. The gateway does this by sending extra information to the endpoints in an exactly defined part of the call setup procedure. With the help of this information the endpoints can begin with the resource reservation process. For the capability of initiating resource reservation, the endpoints must be modified, but the protocols remain untouched. If there is no chance to modify the clients, resource reservation can be done by a simple agent near to the endpoints, by proxying the signalling traffic to the clients. These agents filter the signalling messages, and pass only those messages to the clients, which fit into the standard signalling sequence. Using the information taken from the transiting messages, the agents are able to start the resource reservation procedure.

Beside the designing of the needed call flows, my aim way to build an architecture that scales well, and it is easy to extend with new features.