



PROJECT ASSIGNMENT

September 17, 2015

Project title	Distributed EDI service providing medical and health administrative messages between actors in the health sector
Student's name	Hans Henrik Grønsløth [hansheg@stud.ntnu.no]
Course	TTM4501 – Telematics, Specialization Project
Department	Department of Telematics
Supervisor	Magne Mæhre, Norsk Helsenett [magne.maehre@nhn.no]
Responsible professor	Bjarne Helvik [bjarne@item.ntnu.no]

Background Norsk Helsenett SF runs a national Electronic Data Interchange (EDI) service that communicates medical and health administrative messages between agents in the health sector. Today the system runs on a centralised, hardware fault tolerant Linux solution. The SMTP and POP3 protocols are used to send and retrieve the (encrypted) messages, respectively.

Motivation Considering the nature of the messages, it is critical that the system is available at all time. To increase the robustness of the system, e.g. handle failure in the communication infrastructure or crashes in data centers, and to facilitate maintenance without suspending the system, it should be possible to send messages to and retrieve messages from multiple servers across the country.

IP Anycast provides an elegant way of communicating with the nearest¹ available server that is transparent to the application layer. Using IP Anycast can therefore reduce the change needed at the end user when changing from a centralized to a distributed solution.

A Proof-of-Concept environment with 3 virtual servers has been established to demonstrate the feasibility of a possible distributed solution. Here, incoming messages at a user's primary server are copied to an outgoing queue and spread to all other servers. Similarly, when a user retrieves messages from his primary server, a revoke message is put in an outgoing queue and sent to all other servers.

Objectives The long term objective is to make the current centralized solution into a more robust distributed solution. The objectives of the project that will be conducted this fall are:

¹Not necessarily the *geographically* nearest server, but the server with, given the current state of the network, the most cost effective path.

1. Give a description of the state-of-the-art on fault tolerance techniques used in distributed systems with similar characteristics.
2. Suggest a fault tolerant distributed version of the current centralised system that uses IP Anycast, using the Proof-of-Concept as a starting point. This will include addressing detection of inconsistencies, detection of loops, locking problems and scalability. Even though security and performance are essential aspects of the system, these will not be addressed in this project.
3. If time, inject failures in the (possibly modified) Proof-of-Concept environment and investigate the fault handling.