MyDelivery - Executive Summary

A collaborative, prototype tool called MyDelivery provides a novel method of small or large data exchange between two Internet-based Windows clients. The data exchange is mediated by an HTTP-based web server without storage of any user data on the server's hard disk. The server acts as a router, and user data is kept for only few hundred milliseconds in server memory. This memory-centric system architecture minimizes the chance that user data could be lost if the server is compromised or fails. This gives MyDelivery a security advantage over alternative architectures for data exchange that employ server-based disk storage of user data that may potentially be subject to loss due to theft, compromise or natural disaster.

Because MyDelivery contains no encryption software, all communication is unencrypted by default. However, it is easy to encrypt MyDelivery communication by adding a commercially-available Secure Sockets Layer (SSL) or Transport Layer Security (TLS) certificate to the MyDelivery server. With the security certificate, it is possible to use MyDelivery as a HIPAA-compliant system for exchanging electronic medical and health information, including information contained in large files (up to several gigabytes) or large quantities of files (several thousand). MyDelivery communication uses either HTTP or HTTPS protocols, allowing it to pass through nearly all firewalls, and it can be used anywhere on the Internet. Through an email-like client user interface, MyDelivery allows two individuals to message each other, and optionally attach large files or large numbers of files to each message. The communication network can be intermittent or unreliable; MyDelivery uses intelligent communications control to ensure that no user data is corrupted or lost. Potential uses of MyDelivery include medical research, health information exchange, and many business applications.

In addition to the client user interface, the MyDelivery software includes an Applications Programming Interface (API) that allows developers to replace the client with custom software for sending information to a remotely located client. This makes it possible to interface third party systems to MyDelivery, such as health record systems or portable medical diagnostic devices.

Possible applications of MyDelivery include:

- Biomedical research. Electronic exchange of small or large datasets, including large files or large numbers of files. Examples of large datasets could include digital videos of patients, high resolution digitized x-rays, MRI's, and protein databases. An example of large numbers of files would be lab test results residing in thousands of XML files.
- Clinical medicine:
    - Remote medical diagnosis. MyDelivery could be used in remote areas of the country for sending patient health data to experts for remote diagnosis of patient problems. An example might be use of MyDelivery for teleradiology.
    - Second opinions. A physician could use MyDelivery to send patient test results to a colleague across the country to obtain a second opinion.

- o Physician – Patient health information exchange. The MyDelivery client could be distributed to physicians and their patients for exchanging patient health information in a secure manner.
  - o Patient health record exchange. MyDelivery could be used by clinics, hospitals and health insurance companies for securely exchanging portions of patient health records in a HIPAA-compliant manner.
- Government or business data exchange.
- Large file document delivery for interlibrary loan --- great for color image document delivery that is not possible through email.
- Telecommuting. When a remotely located employee connects to an office computer through a VPN, and runs the MyDelivery client on both the local and office computers, it is easy to transfer folders of files between the two computers, while maintaining the entire folder structure.

MyDelivery was created through research and development at the United States National Library of Medicine. The source code for a Windows-based client, API and server is released to the public domain to make it possible for outside organizations to tailor it for their own uses. The accompanying documents, "The MyDelivery Client and API" and "The MyDelivery Server" provide a detailed description of the architecture and design of the client software, the API, and the Server. They should be sufficient to allow an organization to create its own custom MyDelivery server and client, or to interface an existing application directly to MyDelivery.

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