



ShadowLink 2

Overview

April 3, 2013

1 Interfacing with Emdat

ShadowLink is an Emdat developed product that securely moves data between the Emdat servers and client's PC or server over the public Internet. It encrypts files using Secure Socket Layer (SSL) / Transport Layer Security (TLS) protocols that are embedded in the Microsoft Operating System on the local machine for communication across the Internet. As SSL/TLS uses port 443, there are typically no firewall issues.

ShadowLink runs on a client's workstation under Microsoft's Server 2003, Server 2008, XP SP 3, Vista, Windows 7, and Windows 8 operating systems.

1.1 Local Resources

ShadowLink is a service application written using the Microsoft .NET (version 4.0 or higher) framework. It runs as a service in the background, but also has a user interface for entering service account credentials. This interface can be used to monitor the service but is not required to be running.

During installation, the .NET framework version 4 will be installed on the workstation if it's not currently installed. Other than the .NET framework (20 MB), ShadowLink has a small footprint on the client workstation (less than 0.5 MB).

- It uses the local drive for logging and for temporary storage of data while the message is in transit. This temporary storage is cleaned up over time by the ShadowLink service so space is conserved.
- It requires very little memory or CPU cycles.

1.2 Communication

ShadowLink communicates with the Emdat servers over a SSL/TLS connection. ShadowLink uses HTTPS (secure HTTP protocols) to utilize web services running on our servers.

Each HTTPS request is authenticated with a service account login ID, client identifier, password, IP address, and workstation name using basic HTTP authentication over a SSL/TLS session.

- For example, a typical request would be to post a HL7 message with patient information to our server. ShadowLink running on the client's workstation has to successfully authenticate to the Emdat servers to do so.
- Likewise the ShadowLink client will submit an HTTPS request frequently to our servers to see if any transcriptions are available for downloading. These requests also require authentication.

The authentication process also uses the IP address and workstation name from the workstation it is running on. This is compared to the IP address and workstation name that was recorded when ShadowLink was originally configured. This insures that new instances of

ShadowLink cannot be arbitrarily installed without the service account being reset by an authorized user.

ShadowLink was designed to encrypt information using SSL/TLS when transmitted to and from the Emdat servers. No SSL certificates are used on the client-side application; the certificates are used from Emdat's servers. The advantage of using this method is that all communications are performed using the secured SSL/TLS connection which was established inside of the client's network; either within the firewall or within the client's firewall DMZ zone.

Communication between ShadowLink and the client's EHR system is configurable and set up on a case by case basis. It has capabilities to transfer to the EHR using TCP or transferring to a folder or network path. There is a possibility of additional communication methods such as using web services but it may require custom development; any inquiries regarding this can be forwarded to your Emdat contact.

ShadowLink saves information on the workstation only while it is waiting for a response from the Emdat servers that the patient or Associate information was successfully received or while it is waiting for the EMR (or the file store) to respond that the transcription was successfully received. ShadowLink automatically removes all locally stored information.

2 Messages in a HL/7 Environment

ShadowLink transfers patient demographic and appointment information from the client's scheduling system to the Emdat servers and transfers transcriptions from the Emdat servers to the client's EMR s using HL7 message formats.

For the appointment and demographic information, the ShadowLink application installed locally will listen on a specific port for incoming messages. When it receives a message, it will encrypt and forward these messages to the Emdat servers where they will be decrypted, parsed, and loaded in the client-specific patient and appointment tables. When receiving data from the client's system, Emdat is able to accept the fairly standard HL7 formats. The typical messages used to extract the information are A04 (Outpatient Registration) and A01 (Inpatient Registration) messages. Other messages, such as A08 (Patient Updates), O01 and O02 (order messages), and various SCH (scheduling messages) can also be used.

In a similar fashion, the Emdat transcription exports can be produced in a variety of HL7 flavors.

Common Message types:

- MDM (Medical Document Management)
- ORU (Observation Results Message)

Embedded Transcription formats:

- Some clients prefer flat text with a separate line for every 65 characters of text, each in a unique OBX segment.

- Others prefer a single OBX segment with linefeeds designated by an HL7 repetition character (“~” in most cases).
- Some require the body of the report in an RTF or PDF format.
- Some are using newer HL7 Content Document Architecture (CDA) formats.
- Emdat can produce each of these as well as other customized formats.

The Emdat servers produce the proper HL7 export message at a specific trigger point within the Emdat InQuery application. The message is encrypted and queued for delivery by ShadowLink. At the client site, ShadowLink queries the Emdat server at recurring intervals and pulls down these HL7 messages when available. It decrypts the message and then passes it to a specific client-defined IP address and port.

3 Other file formats

ShadowLink is also configurable to accept demographic and appointment information in an Emdat-defined fixed-width text (.TXT) format, a customized fixed-width text format, or a .CSV format. Emdat can also accept many text-based reports that can be parsed for the required information. Instead of listening to a port for an HL7 message, ShadowLink is configured to look in a specific directory for the file or to look into a network share. When the file is present, the file is encrypted and sent to the Emdat server which decrypts the file, parses the required information, and stores it in the client-specific patient and appointment tables.

Similarly, the transcription export can be created on the Emdat servers in a variety of file formats including Microsoft Word (97-2003), .RTF, .PDF formats and .TXT formats. Emdat can include customized “tags” (for identifying patient demographics) in these formats for importing into 3M™ ChartScript™, NextGen®, and other EMRs. Or, patient demographic information from the transcription can be encoded into the file name, file header, or fields such that the EMR system can automatically import and properly post the transcription.

The Emdat Server encrypts the transcription and queues the result. ShadowLink queries the server on a recurring basis and, when a file is present, encrypts the transcription, transfers the file over the internet, decrypts the file, and sends the transcription to a specific IP address and port, or saves the file to a specified directory or network share.

4 Associate information

Most clients send copies of transcriptions to outside referring physicians, insurance companies, or government organizations. The Emdat system saves this address information in a client-specific Associate database. While this database may be updated by hand via Emdat InQuery, the ShadowLink product allows this database to be updated from the client’s EMR database of contacts.

This requires the EMR to produce a file of all new associate records, associate records that have changed, or deleted associate records. ShadowLink will look for this file in a specified directory at recurring intervals and, if present, will encrypt the file and move it to the Emdat Servers. The file is decrypted at the Emdat servers and the records are added to or updated in the Client's Associate database.

Emdat support CSV, TXT, and XML file types. Other text-based file types are also available. The data fields used in the Associate Database are:

- Delete Record – 1 or “D” for delete, blank otherwise.
- Associate ID – the client's system identifier for the Associate. Required to update or delete a record.
- Associate First Name
- Associate Middle Initial
- Associate Last Name
- Business Name
- Specialty – this is used in the address label between Business Name and Address 1.
- Greeting – the greeting used for this associate on letters. (For example, “Dear Dr. Smith:”.)
- Address1
- Address2
- Address3
- City
- State
- Zip Code
- Phone
- Prefix – for example, “Dr. “
- Suffix – for example, “M.D.”
- Fax – the fax number to send copies of report to
- Email – only used in Australia; not in U.S.
- Auto-Fax – Set to a 1 for AutoFax, 0 otherwise.

5 Requirements

ShadowLink runs on a client-supplied Server or PC running Microsoft operating system Server 2003, Server 2008, XP SP3, Vista, Windows 7, or Windows 8. Support for XP SP3 is being dropped in June 2014, the same time as Microsoft is dropping support. Current versions of ShadowLink will continue to work on XP after this time; however, future versions will not be designed or tested for running on XP.

The client is responsible for:

- The PC or Server hardware with a support Microsoft Windows operating system.
- Keeping the operating system upgraded with the most recent Microsoft upgrades.
- Anti-virus and anti-malware software and upgrades.
- Internet connection.
- Initial ShadowLink installation. (Emdat can provide assistance via a remote connection.)

- Specifying the required export, patient, and appointment messages or file formats.
- Working with Emdat on testing.

The installation involves downloading the ShadowLink installation software from an Emdat website, installing the software, entering a client-specific ID and password into the configuration, and notifying Emdat of the installation.

Emdat is responsible for:

- Completing the ShadowLink configuration to extract the required patient and appointment.
- Developing the program to export the transcription into the proper format and configuring ShadowLink to deliver the message / file.
- Testing of the communication path and file / message formats.
- Ongoing day-to-day monitoring of the ShadowLink service. ShadowLink gives Emdat the ability to know that a message has successfully moved across the internet in an encrypted format and delivered unaltered. Depending on the EHR, ShadowLink can also know if the message was successfully received by the EHR.

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