



Muse 2005 – Las Vegas, NV Handout

Presentation Data Sheet

Presentation Title: Survival Guide to Interfacing in a Meditech World

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Presentation Summary:

“We have an interface to Meditech.” This quote is the most commonly used statement made by other vendors when selling Hospitals their product. The problem with this statement is, “What do they really have?”. During this presentation we will discuss what interfacing means, interface terminology, methods used to interface, interface data formats, and interface possibilities within Meditech. This session is designed for all healthcare professional with little or no experience in interfacing. We will walk through all components of interfacing to help everyone understand the opportunity and challenges within Meditech MAGIC and C/S systems.

Target Audience:

IS Staff and Departmental Directors and Staff

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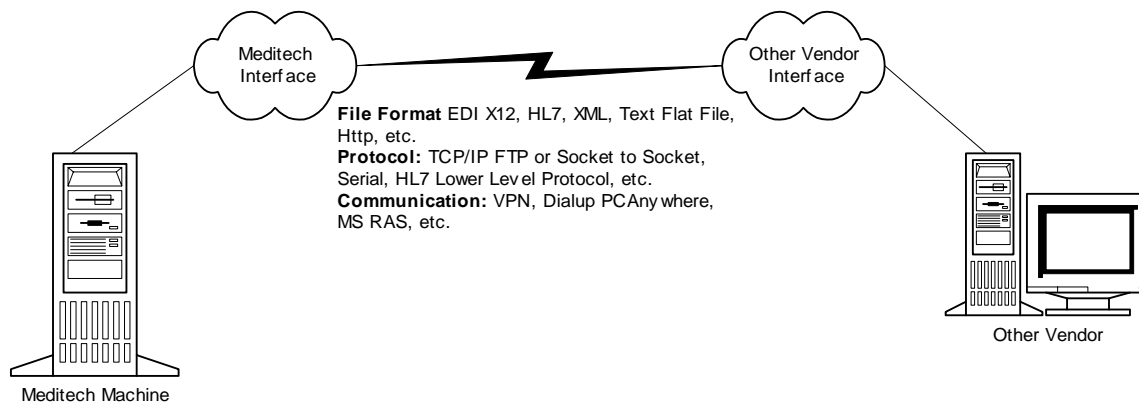
Educational Session Topic: Survival Guide to Interfacing in a Meditech World

Section 1:

Definition:

Interface – A point at which independent systems interact.

Explanation: For Meditech systems this is typically in the form of a software, not hardware, solution and involves two software interfaces; 1) Meditech Interface, 2) Other vendor interface.



Section 2:

Interface Terminology Definitions:

X12 EDI – Electronic Data Interchange standardized data formatting. X12 is an ANSI approved EDI standardized formatting specification.

ANSI – American National Standards Institute

Ethernet – Local area networks use this architecture. Hospitals design their networks based on this industry standard architecture/transport methodology.

Fixed Length – Text data file format that uses fixed length fields to format data in a text file. Sometimes referred to as flat files. Example: HOFFMAN KEN R M

FTP - File Transfer Protocol – a method of receiving or sending files over intranet/internet - Socket number 21

HL7 – Health Level 7 – An ANSI-accredited healthcare specifications for formatting and providing healthcare data.

Internet – A global network connecting millions of computers and over 100 countries.

Intranet – A private network based on TCP/IP protocol and accessible only by the organization's members, employees, or others with authorization.



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LAN – Local Area Network – This network term is used to describe the entire hospital private network or computers that are close together geographically.

Magic Database – Meditech proprietary database structure.

ODBC – Open DataBase Connectivity – A standard database access method developed by Microsoft.

Screen Scraping – A technique in which a software program reads an application screen to extract the data.

Scripting – A technique in which a software program simulates a user keying data into applications screens.

Socket/Port - A single connection point between two systems using TCP/IP. Socket numbers can range from 0 – 65536. There's a set of socket numbers that are called "Well known sockets", that are reserved for a specific use. They range from 0 – 1023.

SQL – Structured Query Language – Query language for database management systems.

TCP/IP - Transmission Control Protocol/Internet Protocol – Meditech calls it their Open Systems Protocol – Commonly used in most computer systems and the internet.

Variable Length - Text data file format that uses variable length fields separated by a defined field separator. Sometimes referred to as flat files. Example: HOFFMAN|KEN|R|M

VPN – Virtual Private Network – A network that is constructed using public wires to connect systems. Typically used via the Internet to connect remote systems securely.

WAN – Wide Area Network – This network term is used to describe computer systems that are further apart geographically and connected via phone lines or radio waves.

XML – Extensible Markup Language – Designed for Web documents. Allows file designer to create their own data elements names (tags).

X12 EDI – Electronic Data Interchange standardized data formatting. X12 an ANSI approved EDI standardized formatting specification.

Additional Definitions:

NOTE: This list of definitions does not, in any way, represent the entire list of technology terms used today. For a more complete list I suggested the Webopedia web site: www.webopedia.com

Section 3:

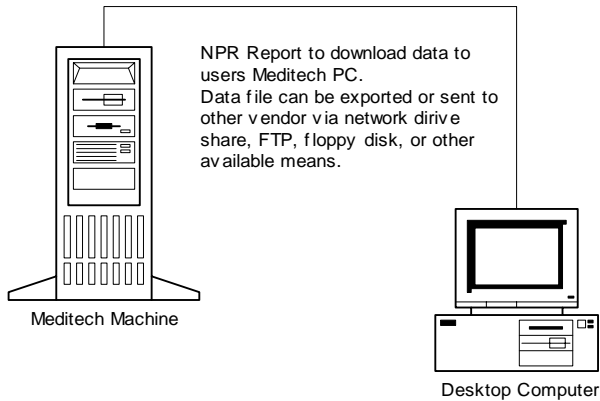
Interface Methodology: In this section we will discuss the *advantages* and *disadvantages* of different methods used to interface Meditech.

NPR Report: Did you know the easiest interface within Meditech is an NPR report download? The advantages of an NPR report type interface is most users can program, implement, and format them themselves.



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Diagram of Workflow:



Advantages:

- NPR reports can be formatted for fixed length, variable length, HL7, XML, EDI X12 and other vendor specified format.
- NPR Reports can be schedule to run and the output can be FTP to other vendors systems periodically, thus eliminating the need for manual processing.
- Hospitals can accomplish these reports type interface internally.

Disadvantages:

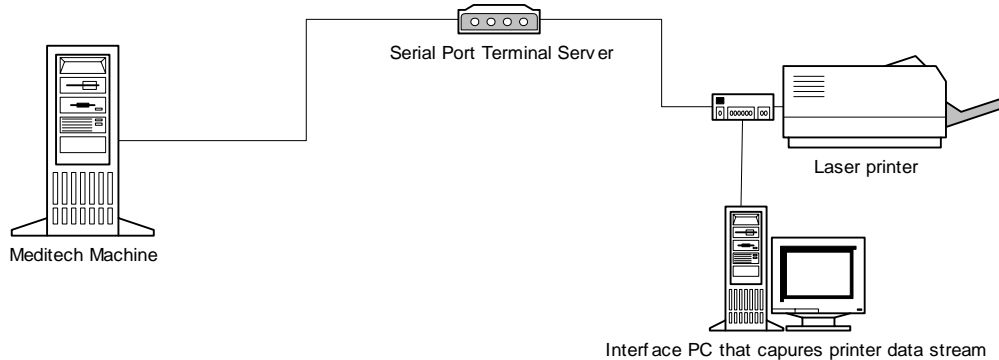
- The NPR report scheduling can be problematic, requiring manual refilling of all scheduled reports.
- Not designed to send real time data.
- Can only send data, not receive it.

Serial or RS232: This type of communication is not used much these days for interfaces, except when interfacing stand alone PC's that are not networked, like Lab instruments. The most common interface of this type is used to capture printed data streams.

Diagram of workflow:



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Advantages:

- Low cost of providing data to other vendor
- Hospitals can accomplish these types of interfaces internally.

Disadvantage:

- No error control, which means data loss is possible.
- Requires Point to Point special wiring.
- Requires special serial terminal server and serial device sharing hardware.

Screen Scraping: This technique reads the screen to extract Meditech data. Not widely used because of the complexity of trying to extract data via screens. Shares most of the same advantages and disadvantages as Scripting.

Advantages:

- Hospital can accomplish these types of interface internally.

Disadvantages:

- Requires frequent monitoring.
- If screen changes, you have to program for that change.
- Data extraction can require several screens.
- Corrupt data extraction very possible.

Scripting: A technique used to simulate a user keying data into Meditech. Scripting programs will receive a data file and then key that data into Meditech based on user program specifications. Most commonly used method for getting data into Meditech.

Advantages:

- Cost effective way of entering data into Meditech.
- Hospital can accomplish these types of interface internally.

Disadvantages:

- Requires frequent monitoring or error notification.
- If screen changes, you have to program for that change.

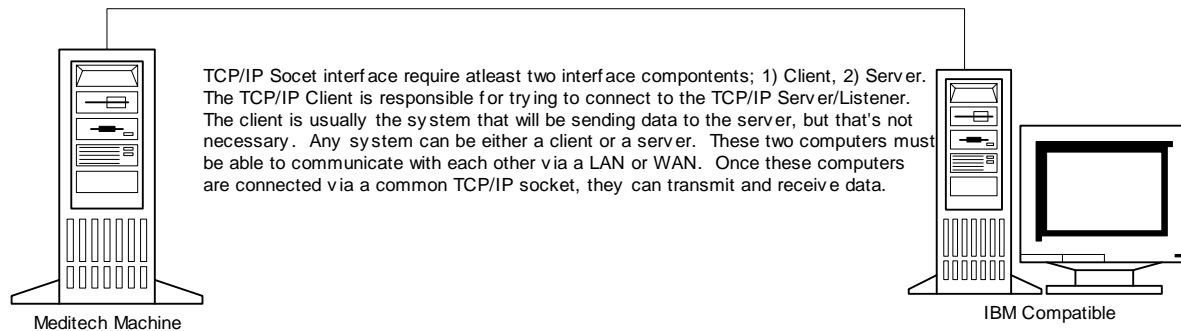
TCP/IP Socket: Allows two systems to communicate directly at network speeds. Once two systems are connected they remain connected until either systems drops the connection. With every TCP/IP socket connection one system must be the client and one must be the server. The



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client connects to the server who is listening on a specific socket number. These socket number range from 0 – 65536.

Diagram of Workflow:



FTP: FTP is a TCP/IP service that allows disparate (different) computer systems to send and receive data files. The sending system need only have the client FTP software available, which most computer systems have. The receiving system must be running a FTP server, which is a TCP/IP Service. The FTP server software comes standard with most server operating systems. FTP server software can also be purchased off the internet.

Advantages:

- Can be used on most any computer system.
- Has several file management commands for remote system.

Disadvantages:

- Meditech's implementation is a little slow and CPU intensive. Sending lots of files could cause your system to slow down.
- Acknowledgement that a file was received completely can be hard to confirm.

Telnet: Though not used in interfacing much, telnet is a TCP/IP service that uses socket number 23. In fact, there are a range of "well known ports" that are reserved for specific purposes: Sockets 0 – 1023.

HL7 Lower Level Protocol (HLLP): This methodology is the most common interface implemented. With TCP/IP as it's transport, HLLP incorporates error detection and error notification for a high level of confidence and reliability.

Advantages:

- Error detection, error notification, reliability, speed.

Disadvantages:

- Usually requires external experience to implement on Meditech.



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Section 4:

File Formats:

HL7 – Health Level 7 – An ANSI-accredited healthcare specifications for formatting and providing healthcare data.

Example Data:

**MSH|^~\&|Radiology|LEM|Radiology||200202250925||
ORM|ORD693912309|P|2.3||
PID|1||**M000000061**||**TEST,CARLISLE**||**19581015**|F|||||||**H00000000828**|
ORC|NW|**0224-0001**|0224-0001|||||||
OBR||**0224-0001**|**RAD^RADIOLOGY**||200202241358|||||||**HAR^HARMON^CHARLES^W**||
Etc.....**

Advantages:

- Industry standard, very efficient, compacted size, flexibility to add additional fields

Disadvantages:

- Raw data file is hard to read

Fixed Length – ASCII data file format that uses fixed length fields to format data in a text file.

Example: HOFFMAN KEN R M

Advantages:

- Easy to format using NPR report type interfaces

Disadvantages:

- Raw data file is hard to read, too much white space, hard to parse/interpret because each interface file can be unique, must have custom data mapping guide.

Variable Length - ASCII data file format that uses variable length fields separated by a defined field separator.

Example: HOFFMAN|KEN|R|M

Advantages:

- Easy to format using NPR report type interfaces

Disadvantages:

- Raw data file is hard to read, hard to parse/interpret because each interface can be unique, must have custom data mapping guide.

X12 EDI – Electronic Data Interchange standardized data formatting

Example Data:

ISA*00* *00* *ZZ*9000000450 *ZZ*J01069*020828*0435*U*00205*000000020*0*P*>~



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GS*HP*9000001450*520100*020928*04354042*1*X*003051~
ST*835*0001~
BPR*1*210.2*C*ACH*CCD*01*075000051**9000000950**01*275971854*DA*20025441*02083~
TRN*1*EFT0556191*9000000350~
Etc.....

Advantages:

- Industry standard, very efficient, compacted size

Disadvantages:

- Raw data file is hard to read, continued version changes require program changes.

XML – Extensible Markup Language – Designed for Web documents. Allows file designer to create their own data elements names (tags).

Example Data:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
- <ORM xmlns:assume="assumptions for translation">
- <MSH>
- <MSH.3>
- <HD.1>Radiology</HD.1>
  </MSH.3>
- <MSH.4>
- <HD.1>LEM</HD.1>
  </MSH.4>
- <MSH.5>
- <HD.1>Radiology</HD.1>
  </MSH.5>
- <MSH.7>
- <TS.1>200202250925</TS.1>
  </MSH.7>
- </MSH>
```

Advantages:

- Industry standard, flexibility to add additional fields, view file in browser

Disadvantages:

- Data files are large compared to HL7, need data mapping document

Data Access Methods:

NPR – Non-Procedural Representation – A standard report writing tool within Meditech MAGIC and Client Server.

ODBC – Open DataBase Connectivity – A standard database access method developed by Microsoft. Used to access non-Meditech data.

SQL – Structured Query Language – Query language for database management systems. Used to access Meditech and non-Meditech data.



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Screen Scraping – Defines a technique in which a software program reads an application screen to extract the data. Used to access Meditech and non-Meditech data.

Magic Database – Meditech proprietary database structure. MAGIC programs can access Meditech data directly.

Client Server Database – Meditech proprietary database structure. Client Server programs can access Meditech data directly.

Section 5:

Meditech Interface Options:

Meditech Interface Offerings:

NMI – Non-Meditech Integration.

C/S Inbox – Meditech Client Server Non-Meditech Integration. Receiving other vendor data to import into Meditech via Meditech custom interfaces.

C/S Outbox – Meditech Client Server Non-Meditech Integration. Sending Meditech data to other vendor.

Other Interface Options:

Scripting – This option allows users to enter data into Meditech without manual keying.

HL7 Lower Level Protocol TCP/IP Socket, FTP service, Serial communications – All allow data exchange between two systems.

PCI Other Data Sources – Allow other data to be integrated with Meditech PCI.

Direct Database Access – Allow data to be accessed and sent to other systems. Both MAGIC and CS.

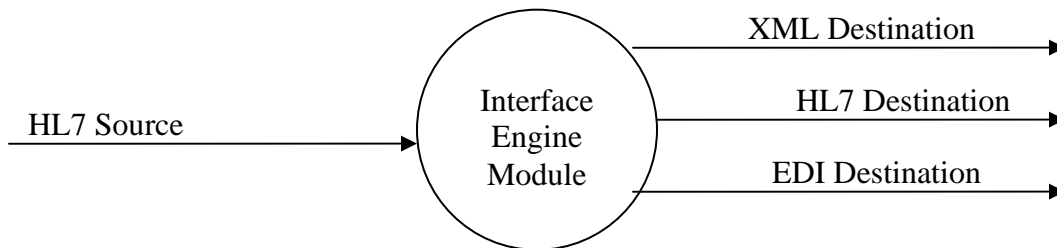


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Section 6:

Interface Engine (IE) Options:

Interface Engines are designed to receive a single inbound data feed, called “source”, and send that single inbound data feed to one or more systems, call “destinations”. Additionally, IEs allow the source data to be reformatted or remapped based on each destination requirements, i.e., HL7 source could be formatted for an XML destination and/or HL7 version 2.1 source to HL7 version 2.3 destination.



Advantages:

- Site is able to add additional interfaces without other vendor assistance.
- Site can data map fields without other vendor assistance.
- Remove additional interfaces from the Meditech transaction system to IE server.
- Cost savings can be realized, however can be hard to calculate

Disadvantages:

- Single source of failure for all interfaces if IE or source feed goes down.
- More staff involvement and technical resource by hospital.
- Source data feeds might not contain all the data needed for all destination feeds.
- Adds another point of failure to the interface
- Can be more expensive then doing point-to-point
- Maintain technical staff to program IE