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Delimited Gateway Data Layout version 2   May 1, 2005

Re: Real Time Gateway to Medicine on Time for Windows

Attached are table structures and descriptions as used in Medicine on Time for Windows. We would like your system to send all relevant data for our tables. Any fields that are double-struck out, are currently reserved for possible future use. You only provide a delimiter for these fields. Generally, a field indicated as numeric where the value is only 1 or 0, 0 is false, 1 is true (there are a few exceptions, like cycletype in Location and Patient tables). The protocol used is TCP/IP. Further description of the proposed interface functionality occurs after the table definitions.

- All dates must be in the format CCYY-MM-DD.
- All numeric values are sent as ASCII formatted strings. (ie: 1.25, human readable, not binary)
- If a value can contain a decimal point, it is required to be present for the value to be accepted (1.00 is acceptable, 100 with an assumed decimal of 2 places is not)
- A 'K' in the Required column of the table description denotes the field as a Key field, and is required for all functions.
- An 'A' in the Required column denotes the field as required on 'Add' records
- A 'C' in the Required column denotes the field as required on 'Change' records
- All phone numbers are formatted such that they are 10 characters long, left filling spaces if no area code is present

If the TCP/IP connection is lost, the prescription system should write to an ASCII text file in the exact same format as described for each record type, until the connection is re-established. The name of the file should be unique, with a file extension of ".gat" or ".txt". The Rx system must then either provide a means of getting the text file to the Gateway machine so the user can open the file via the Gateway user interface, or the Rx system must open the file and read it to the Gateway machine line by line over the TCP/IP connection.

The Gateway is designed to be used with triggers within the Rx system, when a user adds or updates a record. The trigger should send the new or updated information to the MOT Gateway. On a Change record, only the changed fields (plus the key fields) should be sent. On an Add record, all possible fields should be sent.

We are assuming an initial data dump from the Rx system to the Gateway machine, to initialize the underlying data. This is to prevent future changes to a patient, or a new rx for a patient, from causing a new patient record to be created because the RxSystem.Patient ID was missing or different in the currently existing MOT patient data. The initial data dump can be done in one of three ways:

1. In the format as described herein for each record type in TEXT file format with each record ended with CRLF (ASCII 13 + ASCII 10), end of file is (ASCII 26). See Page 8 for more detail. MOT Gateway can read a TEXT FILE in the proper format. Same as discussed in Paragraph #3 above in the event the TCP/IP connection is lost.
2. Via the TCP/IP connection discussed in this document.

Table: Prescriber

	Field Name	Required	Type	Max Length	Comments
1.	~~DocCode*~~		~~numeric~~		~~0 to 2147483647~~, reserved for future use
2.	LastName	A	char	30	
3.	FirstName	A	char	20	
4.	MiddleInitial		char	2	Room for 2 characters. Should NOT have a period if only 1 letter (the "." is auto added during report generation)
5.	Address1		char	40	
6.	Address2		char	40	
7.	City		char	30	
8.	State		char	2	2 char abbrev, all upper
9.	Zip		char	9	Zip Code + 4 - no "-" character
10.	Phone		char	10	
11.	Comments		char	32767	Any other miscellaneous info you want to keep
12.	DEA_ID		char	10	Does not contain "-" character. If a "|" (vertical bar) is found after the DEA #, we will use the following characters as the NPI #
13.	TPID		char	10	can be used as Telephone extension, or pager info
14.	Specialty		numeric		Range is 0 to 18, Links to our specialty table. 0 is Family Practice. Table can be furnished if desired
15.	Fax		char	10	
16.	PagerInfo		char	40	notes for pager #, pager id, whatever
17.	RxSys_DocID	K	char	10	Rx system unique doctor identifier – this is the unique field that identifies the doctor in the MOT system it is **REQUIRED**

Table: Drugs

	Field Name	Required	Type	Max Length	Comments
1.	~~Seq_No*~~		~~numeric~~		~~0 to 2147483647~~, reserved for future use
2.	LblCode		char	6	FDA Labeler code, prefilled for FDA loaded data
3.	ProdCode		char	4	Ditto LblCode
4.	Tradename		char	100	Ditto LblCode
5.	Strength		char	10	Free form character field. Usually a number (i.e.: 500)
6.	Unit		char	10	Type of strength (i.e.: MG)
7.	RxOtc		char	1	R or O depending on whether the Drug is Prescription or Over the Counter
8.	DoseForm		char	11	Tablet/Inhalant/Capsule/etc.
~~9.~~	Route		char	9	Oral/Nasal/Injection/etc.
10.	~~Firm_Seqno~~		~~numeric~~		~~0-2147483647~~, reserved for future use
11.	DrugSchedule		numeric		2-7 - FDA Drug schedule
12.	VisualDescription		char	20	Visual description of the physical drug. Currently there is only room for 12 characters on the labels, but this may change in the future when laser labels are available
13.	Drugname	A	char	40	Appears in the pick lists for MOT
14.	ShortName		char	16	appears on the printed bubbles for MOT card labels
~~15.~~	NDCNum		char	12	Full NDC Number, no "-"s included
16.	~~FDA_Rec~~		~~numeric~~		~~0-1~~, reserved for future use
~~17.~~	SizeFactor		numeric		1 to 6, 99 - Size of pill in relation to how many fit in MOT package bubble. 99=Bulk drug that does not get packaged (ie: liquids). If missing, defaults to 1.
18.	~~ShowInPicklist~~		~~numeric~~		~~0-1~~, reserved for future use
19.	Template		char	1	MOT Drug template for putting drugs into the bubbles (A-N) upper
20.	ConsultMsg		char	45	for drugs with consultation messages (i.e.: Do not operate heavy machinery while taking ...)
21.	GenericFor		char	40	Allow Pharmacist to define sets of similar (generic) drugs for replacing in existing Rxs
22.	RxSys_DrugID	K	char	11	**Unique** identifier for drug in Rx system, **REQUIRED if 22 delimeters.** If NOT included (no delimiter for it) drug will match on ndc number.

Table: Location

	Field Name	Required	Type	Max Length	Comments
1.	RxSys_StoreID		char	10	same as RxSys_StoreID store table
2.	LocName	A	char	60	
3.	Address1		char	40	
4.	Address2		char	40	
5.	City		char	30	
6.	State		char	2	2 char abbrev, all upper
7.	Zip		char	9	Zip Code +4, no "-" character
8.	Phone		char	10	
~~9.~~	Comments		char	32767	
~~10.~~	~~colortbl*~~		~~numeric~~		~~0 to 127~~, reserved for future use
~~11.~~	RxSys_LocID	K	char	10	
~~12.~~	~~show_lot_and_exp*~~		~~numeric~~		~~0, 1 or 2~~, reserved for future use
~~13.~~	~~PRNSwitch*~~		~~numeric~~		~~0 or 1~~, reserved for future use
14.	CycleDays		numeric		0 to 35, default number of days for a new patients cycle (if not provided on a new patient record), 0 = anniversary (same day of each month, capped at the 28th day of a month)
~~15.~~	CycleType		numeric		0=monthly, 1=weekly, default for new patient (if not provided on patient record)
16.	~~RFReminderDays*~~		~~numeric~~		~~0 to 5~~, reserved for future use

Table: Patient

	Field Name	Required	Type	Length	Comments
1.	~~MotPatID*~~		~~numeric~~		~~0-2147483647~~, reserved for future use
2.	RXSys_PatID	K	char	10	Rx system unique identifier for a patient, **REQUIRED**
3.	LastName	A	char	30	
4.	FirstName	A	char	25	
5.	MiddleInitial		char	2	Room for 2 characters. Should NOT have a period at all
6.	Address1		char	40	
7.	Address2		char	40	
8.	City		char	30	
9.	State		char	2	2 char abbrev, all upper
10.	Zip		char	9	Zip Code + 4 - no "-" character
11.	Phone1		char	10	
12.	Phone2		char	10	
13.	WorkPhone		char	10	
14.	RxSys_LocID	A	char	10	same as the RxSys_LocID from location, if not sent, patient will be assigned to the Default Location in MOT.
15.	Room		char	10	Free form room number
16.	Comments		char	32767	
~~17.~~	Gender		char	1	U – unassigned (default), F – Female, M – Male, although all letters will be accepted in the event we expand the definitions (added 3-19-2014)
18.	~~RFRemindor*~~		~~numeric~~		~~0 to 5~~, reserved for future use
19.	CycleDate		date		CCYY-MM-DD – date the patients next card batch is due, defaults to today if not supplied
20.	CycleDays		numeric		0-35, number of days in patient card cycle, 0 = anniversary day of month, capped at 28th, if not supplied, defaults to value on associated location record
21.	CycleType		numeric		**0** = monthly, 1 = weekly (format of card), if not supplied, defaults to value on associated location record
22.	Status		numeric		1 = Hold, **0** = Active
23.	RxSys_LastDoc		char	10	RxSys_DocCode that was sent with a prescriber
24.	RxSys_PrimaryDoc		char	10	RxSys_DocCode that was sent with a prescriber
~~25.~~	RxSys_AltDoc		char	10	RxSys_DocCode that was sent with a prescriber
26.	~~DofTimes*~~		~~char~~	~~32767~~	reserved for future use
27.	SSN		char	9	no "-" characters
28.	Allergies		char	32767	
29.	Diet		char	32767	
30.	DXNOTES		char	32767	
31.	TRMTNOTES		char	32767	
32.	DOB		date		CCYY-MM-DD
33.	Height		numeric		0 to 32767, in inches
34.	Weight		numeric		0 to 32767, in pounds
35.	ResponsibleName		char	32767	Freeform text for person/entity responsible for this patient
36.	InsName		char	80	Name of Insurer for patient
37.	InsPNo		char	20	Insurance Policy number
38.	AltInsName		char	80	Alternate insurer
39.	AltInsPNo		char	20	Alternate policy number
40.	MCareNum		char	20	Medicare Number
41.	MCaidNum		char	20	Medicaid Number
~~42.~~	AdmitDate		date	10	CCYY-MM-DD, date patient admitted to facility
~~43.~~	~~CycleDateEnd~~		~~date~~	~~10~~	no longer used by MOT
44.	~~Ok*~~		~~numeric~~	~~1~~	~~0 or 1~~, reserved for future use
45.	Chart_Only		numeric	1	**0** = new rx not chart only, 1 = new rx is chart only

Table: Rx

	Field Name	Required	Type	Length	Comments
~~1.~~	RxSys_PatID	A	char	10	Rx system unique identifier for the patient
2.	~~motrxnum*~~		~~numeric~~	~~10~~	~~0 to 2147483647~~, reserved for future use
3.	RxSys_RxNum	K	numeric	12	(0-99,999,999,999,999)Rx system unique identifier for this prescription, **REQUIRED**
4.	RxSys_DocID	A	char	10	RXSys_DocID that was sent with a prescriber
5.	Sig	A	char	32767	Freeform text for directions
6.	RxStartDate		date	10	CCYY-MM-DD, date this Rx written. Default is today if not provided
7.	RxStopDate		date	10	CCYY-MM-DD, date this Rx expires - if not sent, default is rxstartdate + [user settable days].
8.	DoseScheduleName		char	10	name of the dose schedule for this rx, by location
9.	Comments		char	32767	Freeform text for additional notes/comments
10.	Refills	A	numeric		0-254, number of refills for this rx
11.	RxSys_NewRxNum		numeric	10	if this Rx has been renewed, this will be the Rx number that replaces the current one (If this is provided, the current Rx will have it's DC date set to today, unless DC date is provided). Another record is expected for the new rx.
12.	Isolate		numeric		0 = drug can be put with others on same card, 1 = put drug on card by itself
13.	MDoMStart		numeric	2	1 to 31 (only if rxtype is 7), also used if rxtype is 18, see below for info
14.	MDoMEnd		numeric	2	1 to 31 (only if rxtype is 7)
~~15.~~	NDCNum		char	11	obsoleted by field 24, will still work for version 1 records with 23 fields
16.	~~Ok*~~		~~numeric~~	~~1~~	~~0 or 1~~, reserved for future use
17.	QtyPerDose	A	numeric		0.00 to 9.75, only required for RxType = 2 (PRN)
18.	QtyDispensed	A	numeric		0.00 to 999.75
19.	RxType		numeric		0 to 21, see Rx Type List below
20.	Status		numeric		0-3, 99, 0/100 = DC (ignored for v2 records with 25 fields, if only 23 fields, DC Date becomes 'today()'), 1=active, 2=chart only (chart only prescriptions do not get packaged on cards but do appear on reports, 3=un-chart only, 99 = ignore/hold Rxs will not be packaged or appear on reports.)
21.	DoW		char	7	string representing days of the week. always 7 chars, X represents a day the drug will get put into a bubble on the card. Sunday is in the first position. (REQUIRED for RxType 5)
22.	SpecialDoses		char	32767	string representing a custom built card. Format is 0.00, repeated for each day of cycle. Can contain up to 35 doses (Required for RxType 8)
23.	DoseTimesQtys	A	char	32767	list of times/doses in same formatted as HHMM0.00 (or HHMM00.00), where HHMM represents the Hours:Minutes and 0.00 represents the quantity for that time. This repeats for as many times (up to 24) as there are doses desired per day. Not required for RxType 2 (PRN). Not required if a DoseScheduleName other than 'Custom' is sent (field #8).
24.	RxSys_DrugID	A	char	11	RxSys_DrugID that was sent with Drug Record
25.	DiscontinueDate		date	10	Date Rx was discontinued

If short version (fields 1-23) is used, RxSys_DrugID is not required on add, and will come from the NDCNumber (field 15).

Continued on next page.

Fields 8 and 23 are companion fields. You can use either or both, depending on what you're trying to send. If your RxSystem sends a dose schedule name (Field 8 NOT PRN and NOT CUSTOM) AND a dose time string (field 21), Gateway will create a dose_schedule record if it does not exist in MOT. If you send ONLY field 23, MOT Gateway will assign dose schedule name 'Custom' and use the dose time string you send. If you send ONLY Field 8, Gateway will determine if there exists a dose schedule to match the name. If there's a match, Gateway will use that dose schedule name. Otherwise Gateway will assign a dose schedule name of 'Custom' and a dummy TIME/QUANTITY (take 0 at midnight).

Rx Type List:

Value	Type	Isolate Values	Other Fields Used
0	Daily	0/1	
18	Alternating	0/1	MDOMStart – represents # of alternating days, if not sent, default to 1
3	QOD (every other day)	0/1	Internally converted to Alternating 2 days
15	Q3D (every third day)	0/1	Internally converted to Alternating 3 days
5	Day Of Week	0/1	DoW – see description above
7	Day Of Month	0/1	MDOMStart & MDOMEnd – see description above
8	Monthly Special	1	
9	Weekly Special	1	
2	PRN	1	QtyPerDose
13	Sequential	1	
20	Monthly TCustom	1	
21	Weekly TCustom	1	

Legacy Rx Types - will be converted as appropriate

Value	Type
1	Weekly
4	Weekly QOD
6	Weekly DOW
14	Weekly Q3D
10	Weekly DOM

Table: Store

Field Name	Required	Type	Length	Comments
1. RxSys_StoreID	K	char	10	Rx system unique identifier for the store
2. StoreName	A	char	60	
3. Address1		char	40	
4. Address2		char	40	
5. City		char	30	
6. State		char	2	
7. Zip	A	char	9	
8. Phone	A	char	10	
9. Fax		char	10	
10. DEANum	A	char	10	DEA number that goes with the store, no "-" included

Table: TimesQtys (hours of administration (aka: dose times/qtys))

Field Name	Required	Type	Length	Comments
1. RxSys_LocID	K	char	10	Rx system unique identifier for the location
2. DoseScheduleName	K	char	10	Name of the schedule (can be used in Rx); a DoseSchedule name CANNOT BE CHANGED once it's added.
3. DoseTimesQtys	AC	char	192	list of times/doses in same format as HHMM0.00, where HHMM represents the Hours:Minutes and 0.00 represents the quantity for that time. This repeats for as many times (up to 24) as there are doses desired per day.

These are 2 new tables supported in Gateway v2. Field comments are self-explanatory.

TCP/IP Transfer Format

Using the structures as given above, we would like to have the data come over in a serial stream via a TCP/IP port 24042. Fields will be delimited by a 0xEE (ASCII 238), empty (or unused) fields will have no data at all. If record is sent as a change to data, only the changed fields (plus the required fields) should be sent. After the last field of each record there must be a checksum, 32bit CRC (each 4 bytes of the data makes a long int, added sequentially, pad with NULLS (0x00) to create a string length evenly divisible by 4) as a numeric ASCII string (sample code is on Page 9). At record end will be a 0xE2 (ASCII 226). Once a record has been received, it will be checked and an ACK/NAK (0x06/0x15; ASCII 6/21) will be returned, if you are capable of reading and dealing with a variety of errors, the following table return values are available instead of the NAK char.

> 0x0A - invalid table type
> 0x0B - invalid process type
> 0x0C - invalid terminating character
> 0x0D - split characters not found (0xEE)
> 0x0E - invalid CRC

At end of all data, send a 0x1A (ASCII 26). This final character is the indicator for our program to disconnect the socket. If you choose to leave it open all the time, although restarting the gateway will break the link, that's ok too. Just keep in mind you'll have to check to see that the link is still valid before sending.

The first 2 bytes of data received will determine the table and action to perform.

Table Identifiers	Actions
P – Physician	A - ADD
D - Drug (Listings)	C - Change
L – Location	D - Delete
A - Patient	
R - Rx	

On any field that becomes blank (i.e.: Patient Middle initial was removed) the field that shows up on our end should be a single space. When a field is empty (no data) it is considered as unchanged and will be ignored.

All numeric fields will be sent as an ASCII string, with decimal places as required.

Sample Data Conversation:
Connect to port xx at MOT Data Gateway (address will vary by site)
Sent by Rx System:
PA••Kevorkian•Edward••1313 Mockingbird Heights Ave•Apt. 13d•Baltimore•MD•21206•4108444444••KB12345678•••••KE1•51861988*

Note • represents 0xEE The checksum should include all data (include the 0xEE's) up to the checksum (but not including the 0xEE just before the checksum.)
> * represents 0xE2 – this indicates the end of the string and is not a part of any checksum calculation

Reply from MOT:
ACK

REPEAT FROM "Sent By" FOR EACH RECORD

Prescription System:
Ctrl-Z (0x1A)

Reply from MOT:
ACK

Prescription System can now disconnect safely.

Sample CRC calculation program – result has been verified against actual checksum from gateway data

```c
#include <stdio.h>
#include <string.h>

void Calc_CRC(char *sz_StringIn, unsigned long *l_Rtn)
    {
    unsigned long ul_CRC = 0L;
    int y, x, z;

    unsigned long *LongPtr = (unsigned long *) sz_StringIn;

    x = strlen(sz_StringIn);

    // assuming that [x] must be NULL already, blank the next 3 bytes
    sz_StringIn[x+1] = 0x00;
    sz_StringIn[x+2] = 0x00;
    sz_StringIn[x+3] = 0x00;

    z = x >> 2;                    // divide existing length by 4 for the LONG pointer count
    if ((x % 4) > 0) z++;          // if any remainder of division, increase CRC length by 1

    for (y = 0; y < z; ul_CRC += LongPtr[y++]);

    *l_Rtn = ul_CRC;
    }

void main()
    {
    unsigned long crc = 0;
    // note: the test string does NOT include a final \xEE, and is padded with NULLs to
assure a memory space evenly traversed in 4 byte increments
// Document Note: The wrapping point below is a SPACE in the string
    char test_string[] = "PAîîKevorkianîEdwardîî1313 Mockingbird Heights AveîApt.
13dîBaltimoreîMDî21206î4108444444îîKB12345678îîîîîKE1\0\0\0\0";

    Calc_CRC(test_string, &crc);

    printf("String Length=%d, Resulting CRC=%lu\n", strlen(test_string), crc);

    }
```

****** Revision history
6-21-06 – minor changes to field names to make it consistent with the XML format

4-5-12 – phone # change

m:\clients\mot\docs\gateway-v2-delimited.doc