

2018 MUSE International

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704 - Soup to Nuts - Data  
Repository 101

Presenter: Jamie Gerardo

# Today's Agenda

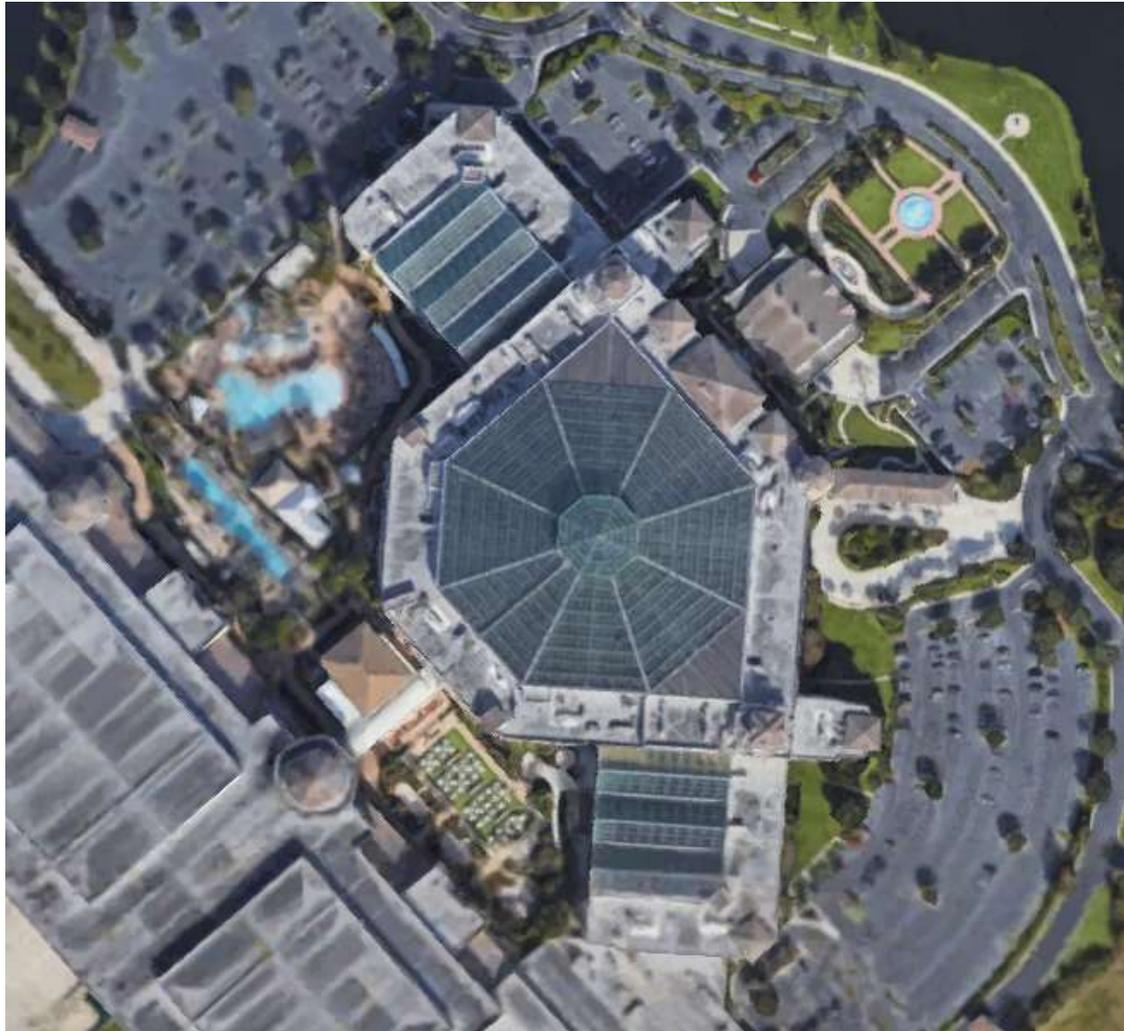
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- Data Repository Overview
- Operational Management
- Data Validation & Auditing
- Microsoft SQL Server & Management Studio
- Report Presentation Options

# Data Repository Overview

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# What is the Data Repository?

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- For starters, it's a big database
  - Most BI architects would call it a data warehouse
- A relational database...sort of
  - Database table structure is dictated by the MEDITECH applications' hierarchical database design (e.g., ADM.PAT, BAR.BCH, LAB.SPEC, etc.)
  - It has minimal metadata (i.e., data about data – where did this data come from?)
  - Business rules are maintained in MEDITECH (no foreign keys or DRI in the database)

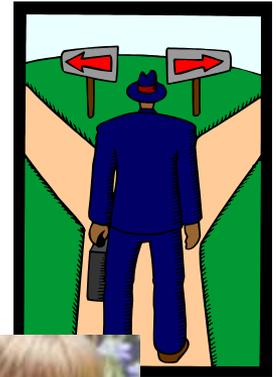


# Why Use the Data Repository?

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Or...why shouldn't I use NPR/Report Designer?

- DR was originally developed as a decision support platform
  - Ideal for retrospective aggregate reporting
- As MEDITECH has evolved, so has the DR
  - Near real-time data latency allows for clinical, patient-centric reports too



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# Data Repository Benefits

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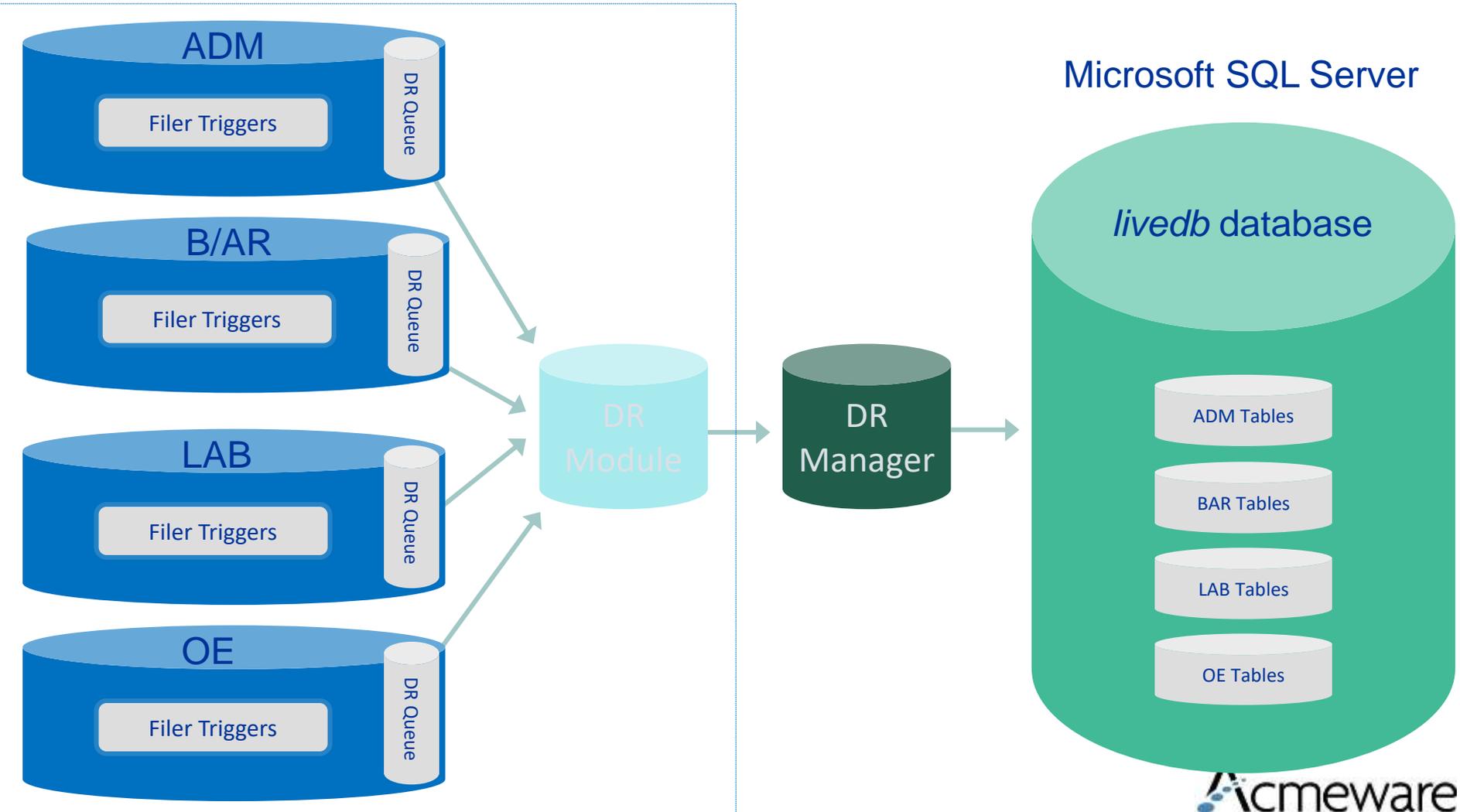
- SQL recordsets can be used for both detail and summary reports
  - Meaningful Use measures
  - Inpatient census → patient account details → Lab test results
- Cross-module reporting is easy
  - Show patient demographic info from ABS/ADM/BAR along with all diagnoses, pharmacy drug administrations, clinical documentation
- Retrieving data from SQL is fast – forget about waiting for the report to compile
  - Writing efficient queries is key
  - Create your own indexes for even better performance
- Develop datamarts to feed web applications or data extracts to other systems
- DR is not affected by MEDITECH application downtime
  - Great resource for critical reports when MEDITECH is offline (eMAR, Inpatient Order Summary, etc.)

# DR Components

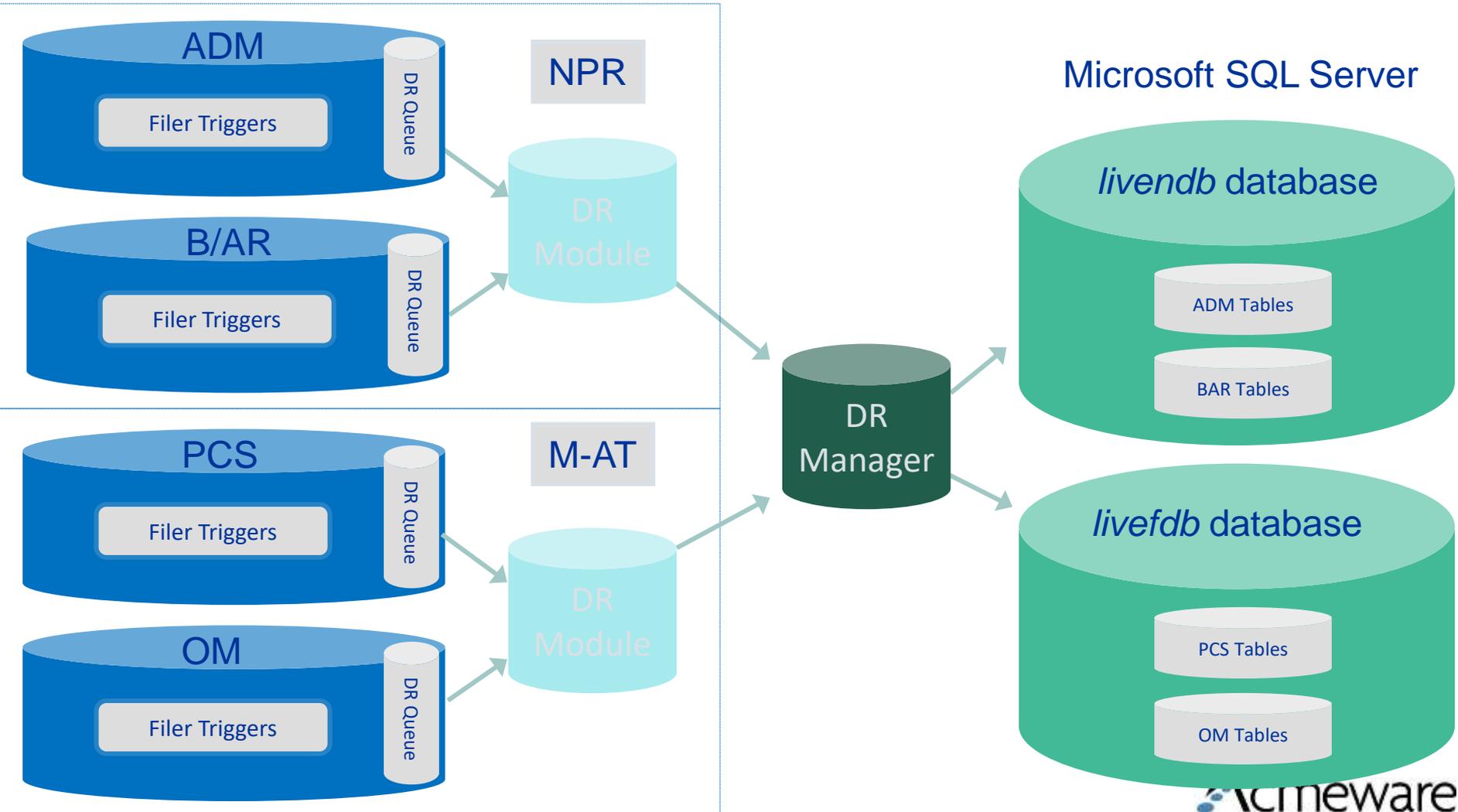
- MEDITECH DR data extraction code (automated “hooks”) are present in every application module (ABS, ADM, BAR, etc.)
- MEDITECH Data Repository application module
- DR Manager application (a Windows server-based component)
- SQL Server Databases
- The DR has a lot of potential, requires client report and/or application development to provide end-user value



# DR Component Schematic – MAGIC & C/S



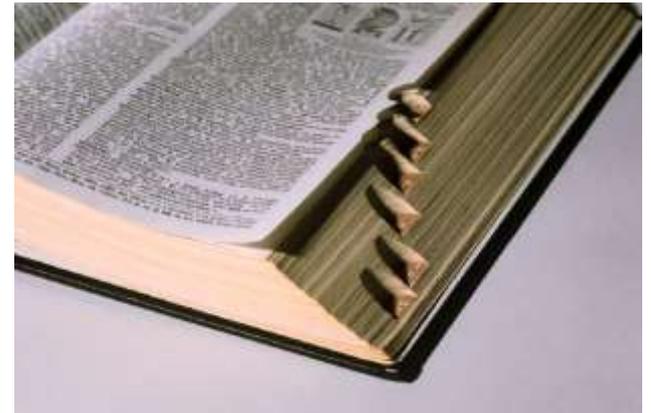
# DR Component Schematic – 6.0 & Expanse



# Important DR Terminology

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- Core tables
  - What tables will you use for reporting?
  - Now...with ARRA/Meaningful Use flavors!
- Enabled for transfer
  - Which tables will receive regular, ongoing updates?
- Initial loads
  - How are new tables initialized or existing data discrepancies resolved?



# Meditech DR Product Homepage

<https://www.meditech.com/prdr/homepageCS.asp>

Client/Server

Data Repository

- Product Resource Homepages -

Product Homepage

Contact Us

**Implementing and Supporting Your System**

M C/S 6.x

**Pre-Implementation**

- Introduction
- Implementation Process
- Hardware/Software Requirements
- Core Team Allocation
- Introductory Call

**Building/Training**

- Application Overview WebEx I
- Test Plan

**Go-LIVE Preparation**

- Pre-LIVE Checklist

**Best Practices**

- ARRA Meaningful Use - Eligible Hospitals
- ARRA Meaningful Use - Eligible Professionals
- ARRA Meaningful Use - Oncology

**Training Materials**

- Data Schema
- Data Transfer Process
- Integration
- Manuals
- SQL Server Hardware Migrations
- Presentations
- Table Structures
- Tutorials

**Support and Development**

- Enhancement Bulletins
- Enhancement Resources
- Knowledge Base
- Report Archive
- Updates/DTS Search

**Related Product Pages**

- Report Writer

**Seminars**

- Classroom and Online Evaluations

**Welcome**  
Take a tour

**Customer Service**  
Information headquarters

**NEWS**  
**Newsletter**  
Stay connected

**Survey**  
We value your input

**Resource Center**  
For all applications

[Comparing Data Repository and NPR](#)

[Data Mapping](#) 

[Data Schema](#)

[Database Design Considerations](#)

[Decisions on Data](#)

[Key Levels](#)

[Priority Reporting Tables](#)

### Comparing NPR to DR

Certain objects in MEDITECH NPR correspond to objects in the Data Repository (DR).

For example:

NPR Components	Data Repository
DPMs and segments	DR Tables
ADM.PAT	AdmVisits, AdmittingData, AdmDischarge, etc.
OE.ORD.main	OeOrders
Elements	DR Columns
URNs	Primary Keys (AdmVisits.VisitID)

Each NPR DPM may be associated with multiple DR tables. Also, each NPR element corresponds to a specific DR column.

#### Data segments versus relational table structures

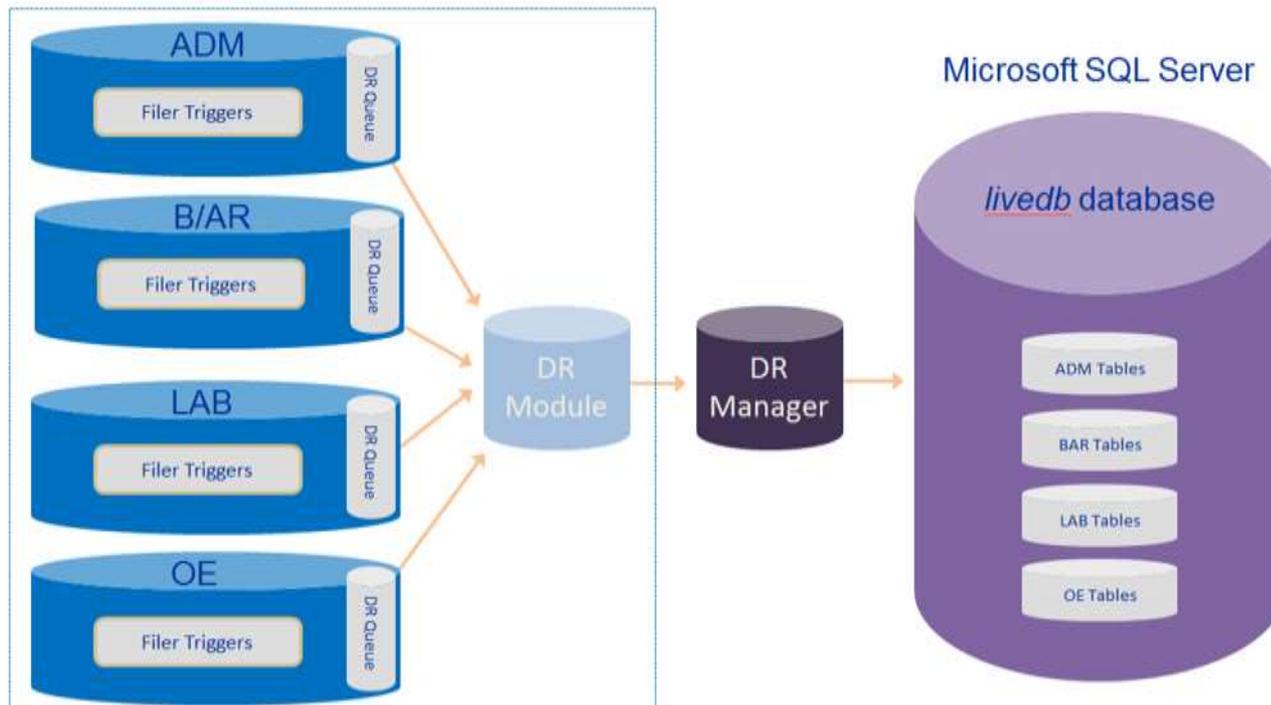
The fundamental difference in the way data is stored in the MEDITECH applications and in the the DR SQL Database is that the MEDITECH NPR elements are stored in a hierarchical format whereas the data in the Data Repository is stored in a relational format. In general, there is one Data

# Operational Management

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# The MEDITECH DR Module



# The MEDITECH DR Module

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- Monitoring DR transfer activity
- Reviewing DR errors
- Logging service issues/tasks with MEDITECH

# DR Main Menu – 6.x (M/AT)

The screenshot displays the DR Main Menu interface. On the left, a navigation pane shows 'Info Systems' expanded to 'Data Repository (M-AT)', with 'Data Repository (NPR)' selected. The main menu area contains the following items:

- Operations Desktop
- Table Inquiry
- Field Inquiry
- Table Reports
- Data Transfer
- View Errors
- View Exceptions
- View Database Logs
- File Maintenance
- Report Initialization
- Initial Load

Callouts point to specific items:

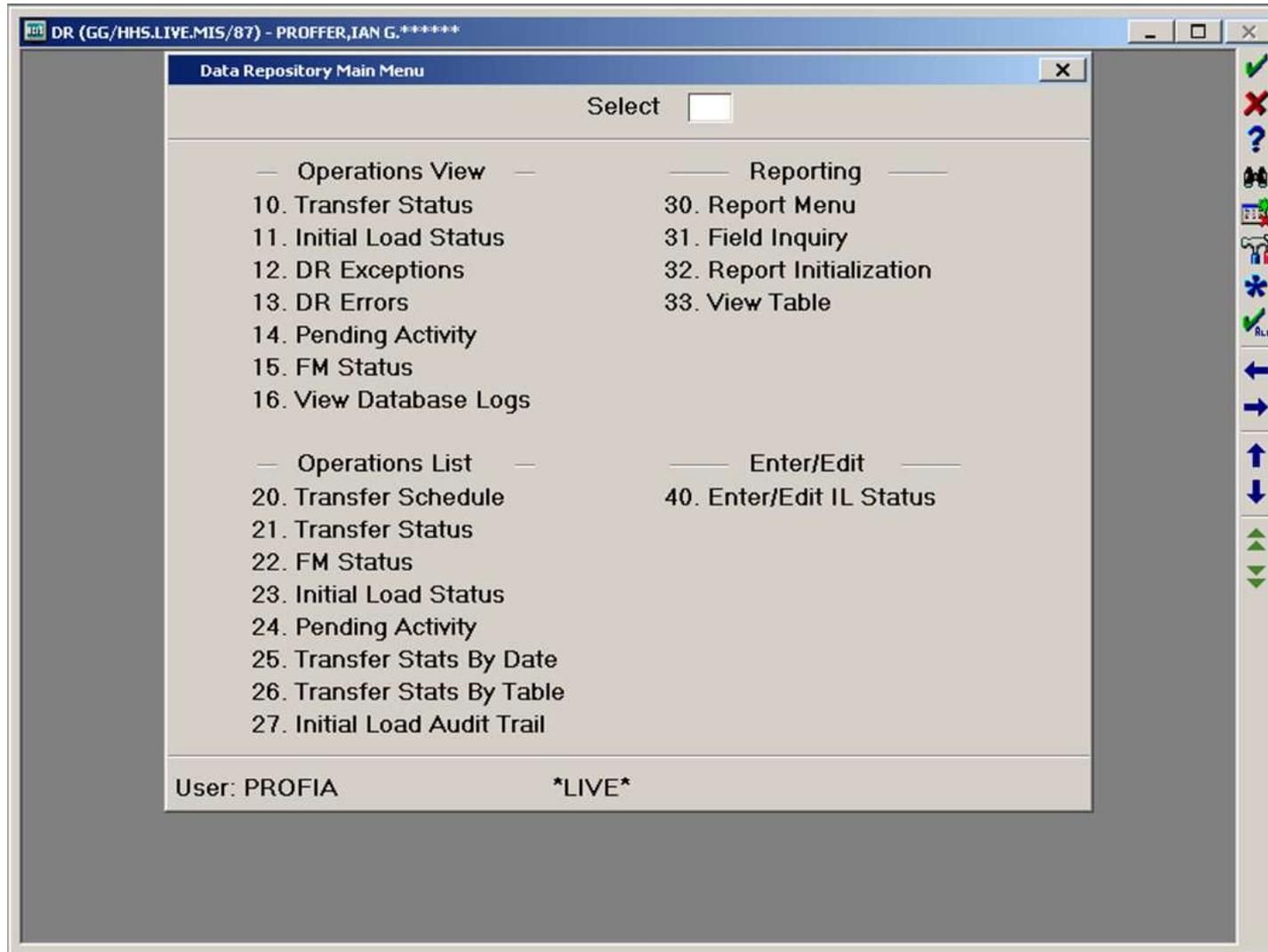
- 'Table and field info; mapping to NPR' points to 'Table Inquiry', 'Field Inquiry', and 'Table Reports'.
- 'Operations: transfers, errors, pending rows' points to 'Data Transfer', 'View Errors', and 'View Exceptions'.
- 'Automated maintenance' points to 'File Maintenance'.

On the right side, there is a vertical navigation bar with 'Back', 'Home', 'Recent', and 'Frequent' buttons. At the bottom, there is a 'Subdivisions' button and a taskbar with system icons and the AcmeWare logo.

# DR Main Menu – Client/Server



# DR Main Menu – MAGIC



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# Operations Desktop – 6.x NPR

Master Background Job: 11541612  
Status: Sleeping for 30 seconds - 05/04/14 9:47am

[Status](#) [Messages](#) [Errors](#)

Master Background Job		
Job	11541612	
Status	Sleeping for 30 seconds - 05/04/14 9:47am	
State	Running	

File Maintenance		
Last Started	05/04/14	0201
Last Ended	05/04/14	0455

Server Maintenance		
Last Started	05/04/14	0301
Last Ended	05/04/14	0301

Database Logs Retrieval		
Last Started	05/04/14	0911
Last Ended	05/04/14	0911

Data Definition Audit		
Last Performed	05/04/14	0910

Monitor

Data Transfers

Initial Loads

Bulk Initial Load

All Errors

Exceptions

Database Logs

Test Service

Purging

Parameters

Dictionaries

Tables

Build Query

[Refresh](#) [Stop Job](#) [View Job](#)

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# Operations Desktop – 6.x M/AT

View DR Monitor Status



DR Monitor	
Job	3381379
Status	Running

File Maintenance	
Status	Completed - 05/04/14 2:00 am
Job Number	
Switch	On
Last Start	05/04/14 2:00 am
Last Finish	05/04/14 2:00 am
DrManager Last Sent	05/04/14 2:00 am

File Maintenance By Component					
Component	Last Start	Last Finish	Status	Switch	Purge Days
Activity	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 18 of 288]	On	14
Errors	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 1 of 9]	On	7
Exceptions	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 1 of 8]	On	7
Audits	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 24 of 366]	On	14
SpecialILs	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 0 of 5]	On	14
Validations	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 0 of 0]	On	14
FileMaint	05/04/14 2:00 am	05/04/14 2:00 am	Finished [purged 0 of 8]	On	5

Refresh

- Monitor
- Audit Logs
- Activity
- Initial Load
- Special IL
- Conversion IL
- Validation
- View Jobs
- Errors
- Exceptions
- Database Logs
- Test Service
- Test ODBC
- Parameters
- Dictionaries
- Field Inquiry



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# Background Transfers



- What do they do?
  - Background jobs monitor MEDITECH applications and send new or updated data to Data Repository tables
- Who manages them?
  - Your staff are responsible for monitoring
  - MEDITECH typically gets involved when jobs are not running properly

# Transfer Activity/Background Jobs

Operations Desktop  
Table Inquiry  
Field Inquiry  
Table Reports  
**Data Transfer**  
View Errors  
View Exceptions  
View Database Logs  
File Maintenance  
Report Initialization  
Initial Load

Enter/Edit Background Job  
**View Master/Transfer Background Status**  
Print Status  
View Pending Activity  
Edit Batch Schedule  
Edit Continuous Mode Schedule  
List Transfer Schedules  
View Transfer Schedules

DR NPR view

Status Information			
Transfer	State	Hang	Trace
BEH.LIVEN,ABS.BEH	Running	30-300	
BEH.LIVEN,ADM.BEH	Running	30-300	
BEH.LIVEN,AP.BEH	Running	30-300	
BEH.LIVEN,BAR.BEH	Running	30-300	
BEH.LIVEN,DR	Running	30-300	

# Transfer Activity/Background Jobs

Activity Pending

From Activity Date 05/20/15

<input checked="" type="checkbox"/> Job	Type	Sleep	Indicators
<input type="checkbox"/> ARM	Application	10	5/100000
<input type="checkbox"/> DR	Application	10	5/100000
<input checked="" type="checkbox"/> EDM	Application	10	5/100000
<input type="checkbox"/> EMR	Application	10	5/100000
<input type="checkbox"/> HIM	Application	10	5/100000
<input type="checkbox"/> MIS	Application	10	5/100000
<input type="checkbox"/> OM	Application	10	5/100000
<input type="checkbox"/> PCS	Application	10	5/100000
<input type="checkbox"/> PHM	Application	10	5/100000
<input type="checkbox"/> REG	Application	10	5/100000

Job Number	Folder	Status	Minutes Behind	Bytes Behind
9230305	APP-REG-0	Idling		0

M-AT Status of DR Activity Jobs



# Monitoring/Maintaining Background Jobs

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- Background jobs can be running without tables getting properly updated
- Look for any status that indicates activity
  - (Running, sleeping, etc.)
  - Halted, crashed, unknown – these statuses require intervention
- Do not reboot server without stopping jobs (completely)



# Adding Background Jobs

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- Why create additional background jobs? (Current job is taking too long to update the DR tables.)
- You can split larger applications into multiple jobs (e.g. BAR).
- You can segment off particular tables that are used for real time reporting.

\* The ability to have additional transfer jobs depends on your current ring release



# Operations – DR Pending Activity

Pending Activity for Beverly Hospital PHA \*LIVE NPR\* database(s)

Application PHA.BEH

Total Pending Rows for Application 107298

DR NPR view

Application and Table Name		Rows
PHA.BEH	.TmpOpIC	1733
PHA.BEH	DPhaChargeFormula	2
PHA.BEH	DPhaInventoryDrugs	50
PHA.BEH	DPhaInventoryLevels	102
PHA.BEH	DPhaInventoryLocations	50
PHA.BEH	PhaInterven	6
PHA.BEH	PhaIntervenAudit	6
PHA.BEH	PhaIntervenBilling	6
PHA.BEH	PhaIntervenStaffMembers	6
PHA.BEH	PhaIntervenWorkload	5
PHA.BEH	PhaPatBatchMessages	749
PHA.BEH	PhaPatCartLabelX	1
PHA.BEH	PhaPatData	50
PHA.BEH	PhaRx	789
PHA.BEH	PhaRxAdditivesTpn	773
PHA.BEH	PhaRxAdjustDoseAdminTimes	777
PHA.BEH	PhaRxAdminDateTimeX	21
PHA.BEH	PhaRxAdminLog	16
PHA.BEH	PhaRxAdminLogNewCmtsText	16
PHA.BEH	PhaRxAdminLogNewQueriesCs	35

# Operations – File Maintenance

View File Maintenance Status

DR Server Maintenance			
Starts at	Server	Last Start	Last Finish
0300	NMN-DR01	05/04/14 0301	05/04/14 0301

DR File Maintenance			
Starts at	Last Start	Last Finish	Status
0200	05/04/14 0201	05/04/14 0455	Completed
Application	Last Start	Last Finish	Status
ABS.NMC	05/04/14 0201	05/04/14 0243	Completed
ADM.NMC	05/04/14 0243	05/04/14 0306	Completed
AP.NMC	05/04/14 0306	05/04/14 0307	Completed
ARM.NMC	05/04/14 0307	05/04/14 0307	Completed
BAR.NMC	05/04/14 0307	05/04/14 0342	Completed
DR	05/04/14 0342	05/04/14 0342	Completed
FA.NMC	05/04/14 0342	05/04/14 0342	Completed
GL	05/04/14 0342	05/04/14 0342	Completed
LAB.NMC	05/04/14 0342	05/04/14 0346	Completed
MIS	05/04/14 0346	05/04/14 0353	Completed
MM.NMC	05/04/14 0353	05/04/14 0353	Completed
MM.PHANMC	05/04/14 0353	05/04/14 0353	Completed
MRI.NMC	05/04/14 0353	05/04/14 0414	Completed
PHA.NMC	05/04/14 0414	05/04/14 0435	Completed
RAD.NMC	05/04/14 0435	05/04/14 0445	Completed
SCH.NMC	05/04/14 0445	05/04/14 0455	Completed

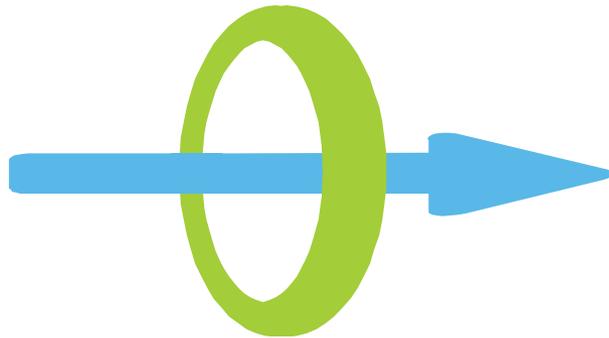
DR NPR view



# Initial Loads

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- What do they do?
  - Special background jobs used to initialize DR tables with all available data from the parent MEDITECH DPM, segment or element
- Who manages them?
  - Your staff are responsible for monitoring
  - Only MEDITECH can start and maintain initial loads

A screenshot of a data table with columns labeled A through L and rows labeled I through M. The table contains data points, with some cells highlighted in yellow and others in grey.

# Operations – Initial Loads (6.x)

Process Initial Loads

0 of 9 Selected

Application	Pace	Hang	Duration	Stopped On	Status
<input checked="" type="checkbox"/> ARM		0	48M	05/02/11 09:39	Completed
<input type="checkbox"/> DR		0	6M	04/29/11 11:37	Completed
<input type="checkbox"/> EDM		0	26M	05/06/11 10:15	Completed
<input type="checkbox"/> EMR		0	7H	05/06/11 16:50	Completed
<input type="checkbox"/> HIM		0	1D 6H 39M	05/07/11 16:29	Completed
<input type="checkbox"/> MIS		0	4H 21M	05/09/11 18:48	Completed
<input type="checkbox"/> OM		0	2D 10H 3M	04/06/13 19:14	Completed
<input type="checkbox"/> PCS		0	3D 12H 43M	12/07/13 23:22	Completed
<input type="checkbox"/> REG		0	5D 15H 12M	05/05/11 03:01	Completed

Last Object  
Last Folder  
Last OID

Job  
Started On 05/02/11 08:50

Useful monitoring of table loads during ring releases or MEDITECH table fixes

# Operations – Initial Load Status

View Initial Load

Database	Idle	Started	Finished	Duration	Status
ABS.NMC		04/15/14 1443	04/16/14 0723	16H 40M	Finished
ADM.NMC		04/15/14 1442			Stopped
AP.NMC		04/29/11 1334	04/29/11 1358	24M	Finished
ARM.NMC		05/25/11 1414	05/25/11 1414	0M	Finished
BAR.NMC		03/26/13 1537	03/27/13 2343	1D 8H 6M	Finished
DR		04/15/14 1442	04/15/14 1449	7M	Finished
FA.NMC		04/29/11 1202	04/29/11 1202	0M	Finished
GL		04/29/11 1216	04/29/11 1250	34M	Finished
LAB.NMC		04/16/14 1139	04/16/14 1156	17M	Finished
MIS		04/15/14 1453	04/15/14 1548	55M	Finished
MM.NMC		09/04/13 1517	09/04/13 1550	33M	Finished
MM.PHANMC		05/12/11 0756	05/12/11 0756	0M	Finished
MRI.NMC		05/26/11 1459	05/26/11 1501	2M	Finished
PHA.NMC		04/23/14 0819	04/23/14 1317	4H 58M	Finished
RAD.NMC		04/01/14 1640	04/02/14 0115	8H 35M	Finished
SCH.NMC		04/01/14 1640	04/01/14 1757	1H 17M	Finished

Job Number

Status Msg

Finished with 10 Table errors



# Dealing with DR Errors

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- Monitoring for recurring or one-time errors
- DR Parameters that affect error diagnosis
  - Activity index days
  - Error log days
- Reporting errors to MEDITECH

# DR Parameters

Activity Days (typically set to 7-10):  
Determines how long activity remains in an  
index to be transferred to DR.

View Parameters

Main Databases Errors/Exceptions Tables

System	
Advanced Technology Platform	
Master	Yes
System Script Suffix	NMN
Script Sending HCIS	NMN.LIVEF

DR Manager	
Version	3.1
Server Port	3531
ODBC Method	DR Manager

Database Model	
Database Model Enabled	Yes

M-AT Database Model	
Server	NMN-DR01
Drive	C:
Database	Livfdb

C/S Database Model	
Server	NMN-DR01
Drive	C:
Database	Livendb

File Maintenance	
Start Time	02:00
End Time	22:00
Switch	On
DR Manager Purge Days	14
FTI Population	No

File Maintenance By Component		
Component	Switch	Purge Days
Activity	On	14
Errors	On	7
Exceptions	On	7
Audits	On	14
SpecialILs	On	14
Validations	On	14
FileMaint	On	5

Monitor  
Audit Logs  
Activity  
Initial Load  
Special IL  
Conversion IL  
Validation  
View Jobs  
Errors  
Exceptions  
Database Logs  
Test Service  
Test ODBC  
Parameters  
Dictionaries  
Field Inquiry

Error Log Days (default is 3): we  
recommend increasing this to 7-10 days

# Operations - DR Errors (NPR)

## DR Error Selection

<input checked="" type="checkbox"/>	Application Database	State	Title
<input type="checkbox"/>	ABS.NMC	ON	Northwestern Medical Center ABS
<input type="checkbox"/>	ADM.NMC	ON	Northwestern Medical Center ADM
<input type="checkbox"/>	AP.NMC	ON	Northwestern Medical Center AP
<input type="checkbox"/>	ARM.NMC	ON	Northwestern Medical Center ARM
<input type="checkbox"/>	BAR.NMC	ON	Northwestern Medical Center BAR
<input type="checkbox"/>	DR	ON	Northwestern Medical Center DR
<input type="checkbox"/>	FA.NMC	ON	Northwestern Medical Center FA
<input type="checkbox"/>	GL	ON	Northwestern Medical Center GL
<input type="checkbox"/>	LAB.NMC	ON	Northwestern Medical Center LAB
<input type="checkbox"/>	MIS	ON	MIS Database
<input type="checkbox"/>	MM.NMC	ON	Northwestern Medical Center MM
<input type="checkbox"/>	MM.PHANMC	ON	Northwestern Medical Center MMPHA
<input type="checkbox"/>	MRI.NMC	ON	Northwestern Medical Center MRI
<input type="checkbox"/>	PHA.NMC	ON	Northwestern Medical Center PHA
<input type="checkbox"/>	RAD.NMC	ON	Northwestern Medical Center RAD
<input type="checkbox"/>	SCH.NMC	ON	Northwestern Medical Center SCH

A summary of recently logged errors within DR; it can be downloaded to a file for regular or automated review.

Date Range: <none>

Type: <none> Table: <none>

Text: <none>

## DR Error Summary

Total Distinct Errors: 3

Last Occurrence	Type	Database	Hits	Error Message
20140504 0000		LAB	3	Unknown error [] - Can't expand activity, DR.DATA.ex..subs is missing
20140504 0000		LAB	3	Unknown error [] - Can't expand activity, DR.DATA.ex..buf1 is missing
20140504 0000		LAB	3	Unknown error [] - Can't expand activity, DR.DATA.ex..b is missing



# Operations - DR Errors (M/AT)

Summary Criteria List

Application	Fatal	Non Fatal	Total
MIS	0	30	30
DR	18	3	21
REG	0	13	13
OM	0	11	11
EMR	0	5	5
HIM	0	4	4
PCS	0	1	1

Summary Criteria List

0 of 13 Selected

Date/Time	Type	Message Text	Source	Appl	Occurrences
03/19/12 18:31	RKFN	RegForm_DischReferrals_DischReferralNote-Primary Key Format	Data Xfer	REG	36
03/19/12 18:31	RKFN	RegForm_DischReferrals_DischReferralAddress-Primary Key Format	Data Xfer	REG	36
03/19/12 18:31	RKFN	RegForm_DischReferrals_DischReferralNotePlain-Primary Key Format	Data Xfer	REG	45
03/19/12 18:31	RKFN	RegForm_DischReferrals-Primary Key Format	Data Xfer	REG	1670
03/15/12 17:00	RSPN	RegAcctQuery_Result-DR Manager Return Non-Fatal	Data Xfer	REG	68
02/20/12 07:39	RKFN	RegForm_DischForms-Primary Key Format	Data Xfer	REG	2137
02/20/12 07:39	RKFN	RegForm_DischForms_Queries-Primary Key Format	Data Xfer	REG	17490
02/20/12 00:57	RKFN	RegAcct_Providers-Primary Key Format	Data Xfer	REG	1702
02/19/12 21:04	RKFN	RegForm_DischForms_QueriesMult-Primary Key Format	Data Xfer	REG	1591
02/19/12 21:04	RKFN	RegForm_DischForms_QueriesText-Primary Key Format	Data Xfer	REG	2482
09/20/11 22:14	RKFN	RegAssignProv_AssignedProviders-Primary Key Format	Data Xfer	REG	3
06/24/11 15:00	RKFN	RegAcct_OtherProviders-Primary Key Format	Data Xfer	REG	3
06/16/11 11:12	FCTN	RegAcct.DataFile-Time Stamp Not Found in Data File	Data Xfer	REG	1

Totals 18 67

Scope	Fatal	Non Fatal	Total
Row	0	29	29
File	0	1	1

Table RegForm\_DischReferrals\_DischReferralNote  
 Object RegForm  
 Last RID {X0-20120319111441893|P|DR. YOUNG GRACE 714776-2100}

# Operations – Download Errors to File

```
File Edit Format View Help
DATE: 02/20/13 @ 1127          DR *LIVE*          PAGE 1
USER:                          Error Log Summary

Date:      02/20/13      Time:      1113
Table:     DRGDIAG      AbsDrgDiagnoses
Sequence:
SourceID:
Program:   DrCapture[ABS.PAT.filer]

App DB:    ABS.UCH      NPR DPM: ABS.PAT
Type:      PR (Program error)
Element:
Expected:
Errored value: ABS.UCH

Hits:      1680
Row:       ZDZ 2848351 D DX
Message:   Missing subscript at position 1 in activity for ABS.PAT.dxs
-----
```

# Determining Which Errors to Report

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- How often is the error occurring? (Just once or repeatedly?)
- Does the error affect the SQL database?
  - Many errors are logged from MEDITECH, but do not affect the DR
- Is the error a symptom of a wider system problem?
  - Network down, server rebooted, etc.
- Only report errors that reference tables that are active (receiving data) and used for reports
- For errors that occur repeatedly, only provide the latest example to MEDITECH
- “Skipped Activity” messages should be reported immediately



# DR Error Examples

## Key items when reviewing errors

### Example not to report:

DATE: 20110414 TIME: 0001  
TABLE: LACSAX1 LabSpecAlerts  
Sequence:  
SOURCEID: OSC MIS DB: OSC  
PROGRAM: DrXferBkg[K]  
APPL DB: SCH.SSM DPM: LAB.C.SPEC  
TYPE: PM Program missing  
ELEMENT:  
EXPECTED:  
ERROR VALUE:  
  
ROW:  
MESSAGE: SCH.SSM's LabSpecAlerts expander  
is missing

This is typically not a table used  
for reports

### Example to report:

DATE: 20110221 TIME: 1143  
TABLE: VISITCLI AdmVisitClinicalQueries  
Sequence: 4391  
SOURCEID: OSC MIS DB: OSC  
PROGRAM: DrXferBkg[T:ADMQUERY]  
APPL DB: ADM.OSC DPM: ADM.PAT  
TYPE: S Socket  
ELEMENT: SQL  
EXPECTED:  
ERROR VALUE:  
  
ROW: 873550 MIO5UD Y 1  
MESSAGE: Primary key VisitID is missing

# DR Error Messages

Always confirm with your DR specialist. These are some general guidelines.

- Messages that don't typically require action

MESSAGE: Unable to open prefixes to ADM.OSH database

MESSAGE: Missing subscript at position 0 for OE.STAT.transcription.stats

MESSAGE: Violation of PRIMARY KEY constraint 'mtpk\_ep551386'. Cannot insert duplicate key in object 'DMisUserC~. Check Server Error Log for more info SQL Non Fatal Error

MESSAGE: Line 1: Incorrect syntax near '{'.. Check Server Error Log for more info SQL NonFatal Error

MESSAGE: Unable to find segment from physical [No prefix for segment [Physical.] and nil in @.db]

MESSAGE: No pointer for include children of AP.AHS.TmpOpIC table

MESSAGE: CON DR Server not responding to ECB command - ACK 98 SQL Fatal Error <VISITCLI> DR Server not responding to ECB command

- Messages you should report to MEDITECH

MESSAGE: AdmVitalSigns Activity skipped, not in Pending status

MESSAGE: Primary key BillingID is missing

MESSAGE: Missing subscript IN ACTIVITY at position 1 for BAR.PAT.main

MESSAGE: Unknown error [SYS] - Segment A is down, unable to start DrXferBkg[T:ADMQUERY]



# Opening Service Issues with MEDITECH

Acmeware Consulting For DR  
This connection to MEDITECH.com is https/ssl secured.

## Service Issues

Issue Status	Submitted By Customer Contact	Module	Text Sort Order	Include Text Entries
<input type="text" value="*ALL*"/> <input type="text" value="All except complete"/> <input type="text" value="Complete"/> <input type="text" value="Change Control (Live)"/>	<input type="text" value="McQueen,Dan"/> <input type="text" value="Proffer,Ian"/> <input type="text" value="Ring,Gary"/> <input type="text" value="Rowe,Martha"/>	<input type="text" value="*ALL*"/> <input type="text" value="DR"/>	<input type="text" value="Chronological"/> <input type="text" value="Inverse Chronological"/>	<input type="text" value="All Text Entries"/> <input type="text" value="Last Entry Only"/>

<input type="button" value="By Module"/>	<b>View/Edit Active Issues By Module</b>			
<input type="button" value="Patient Safety"/>	<b>View/Edit Potential Patient Safety Issues</b>			
<input type="button" value="All Active"/>	<b>View/Edit All Active Issues</b>			
<input type="button" value="Edited Since"/>	<b>View/Edit Issues Edited Since</b>	<input type="text" value="May 12, 2012"/>	<input type="text" value="0000"/>	(Eastern Time Zone)
<input type="button" value="No Edits Since"/>	<b>View/Edit Issues Not Edited Since</b>	<input type="text" value="Apr 12, 2012"/>	<input type="text" value="0000"/>	(Eastern Time Zone)
<input type="button" value="Individual"/>	<b>View/Edit Individual Issue #</b>	<input type="text"/>		
<input type="button" value="AuditTrail"/>	<b>View/Edit Audit Trail Issue #</b>	<input type="text"/>		
<input type="button" value="Download"/>	<b>Download Issues</b>			
<input type="button" value="New Issue"/>	<b>Enter New Service Issue</b>	<b>Would you like to <a href="#">Search our Knowledge Base</a> for issues?</b>		
<input type="button" value="Completed"/>	<b>View Completed Service Issues</b>			
<input type="button" value="Statistical"/>	<b>Statistical Reports</b>			

# Service Issue Guidelines

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- Include ring release version in description along with table name and indication of the issue
  - 5.66 AdmVisitQueries Primary Key Missing VisitID
  - 5.66 MRI.DRC.insure.order - Missing subscript Pos 1
  - 5.66 LabSpecimenResults - Activity Skipped
  - 6.14 PhaRxAdminCriteria – Enable for transfer
- Maintain a Priority List for all of your DR tasks
- Provide as much detail as possible within the task
  - Include error log entry, frequency of error and other relevant symptoms

Issue: DR #6133704 (Mar 2, 2015)

Status: Open

Priority: Routine

**Priority Lists: #3 on DR Priority List**

Description: 5.66.07 LabSpecimenTests - Column Discrepancies

Request Type: Problem

Customer Contact: James Durbin (617-555-1212)

Issue Notification: james@whatsuphosp.org (All Edits)

Module Notifications: ACME,SMH (jmcdonald@acmeware.com) - MEDITECH Edits



# Data Validation & Auditing

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# Auditing and Validation Options

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- Auditing Applications
  - Meditech DR Validation
    - MAGIC and CS 5.65, 6.x
  - 3<sup>rd</sup>-Party Applications
- Manual validation
  - Compare NPR / Report Designer reports to DR reports



# Operations – Validations in M/AT

Process Validations

Filter: <none>

Criteria List Multi-Select

Name	Status	Started On	Duration (hrs)	Coverage	Confidence
PcsAssmnt	Completed	02/04/11 11:50	0.2	100% - 1/1	100%
EMR Acct Pha Tables	Completed	01/20/11 14:26	0.1	~9% - 99/999	100%

This tool is used to validate the data found in the DR M-AT tables.

Tables

PcsAssmntData_Main
PcsAssmntData_Queries

Initial Template  
Saved as Template  
Preserve  
Ended On 02/04/11 12:04  
Pace /0

Recheck Started On  
Recheck Ended On  
Recheck Started By

Last Structure PcsAssmntData  
Last Folder \PcsFacData\MA0  
Last Item MA0-20110120111356484{A^...

New Edit Pacing Preserve Inactivate Stop Recheck Issues Save As Template Refresh

acmeware

# Operations – Validations in C/S

The screenshot displays a software interface for managing data validations. On the left, a navigation menu is open, showing a tree structure under 'Data Repository'. The 'Validations' option is highlighted. To the right, three sub-menus are visible: 'Validations', 'Report Dictionary', and 'Report Dictionary'. The 'Validations' sub-menu is active, showing options like 'Report Dictionary', 'Schedules', 'Process Jobs', and 'Results'. The 'Report Dictionary' sub-menu is also visible, showing 'Enter/Edit', 'View', 'Print', and 'Print by Application'. Below the navigation, a form for configuring a validation is shown. The form includes fields for 'Mnemonic' (AdmVisits), 'Active' (checked), 'Name' (AdmVisits), 'Application' (ADM), and 'All' (N). There are sections for 'Include' (DPM and Tables) and 'Criteria' (Issues to Report, Sample Size, Number to Check in Sample, and Approximate Validation Coverage). The 'Batch Size' is set to 1000 and the 'Pace (In Seconds)' is set to 1000.

**Applications**

- Data Repository \*\*\*LIVE\*\*\*
- MIS Database

**Data Repository**

- Operations Desktop
- Table Inquiry
- Field Inquiry
- Table Reports
- Data Transfer
- Validations**
- View Errors
- View Exceptions
- View Database Logs
- File Maintenance
- Report Initialization
- Initial Load

**Validations**

- Report Dictionary
- Schedules
- Process Jobs
- Results

**Report Dictionary**

- Enter/Edit**
- View
- Print
- Print by Application

Mnemonic AdmVisits

\* Active

\* Name AdmVisits

\* Application ADM

\* All N

Include

DPM

Tables

AdmVisits

Criteria

\* Issues to Report All

\* Sample Size 10

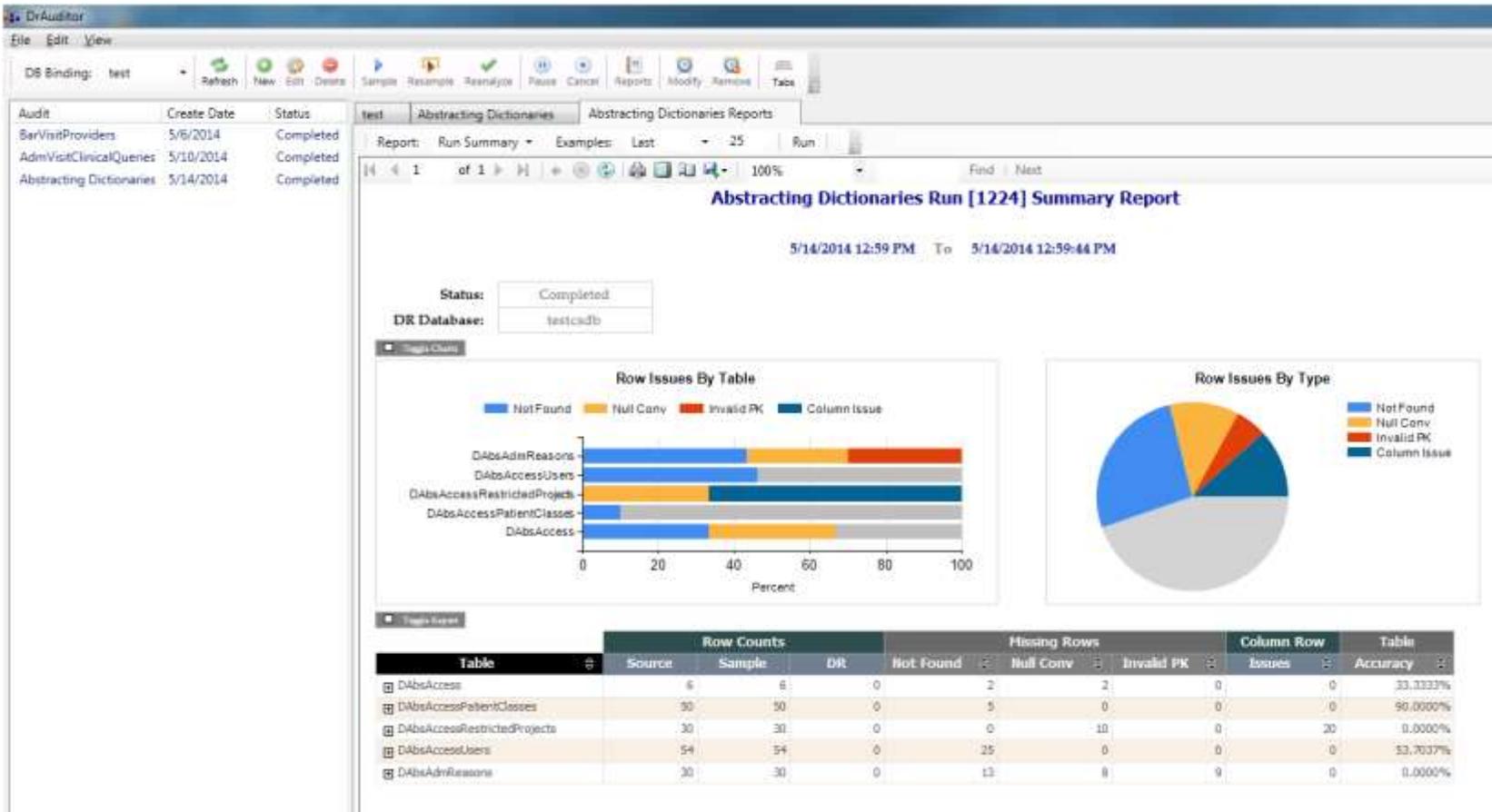
\* Number to Check in Sample 1

Approximate Validation Coverage 10%

Batch Size 1000

Pace (In Seconds) 1000

# Data Validation – 3<sup>rd</sup> Party



# Manual Data Comparison

- Compare content of NPR/Report Designer with DR-based reports
  - Review data side-by-side on existing reports
  - Export data from MT to delimited file; import into SQL and write ad-hoc queries to compare against DR data
- DR tables *DrTableMain* and *DrTableColumns* help you map data from NPR to DR

	TableID	Name	Data Type	Length	SortKey	NprDpm	NprSegment	NprElement
1	avisits	SourceID	varchar	3	1	DR.PARAM	appl.databases	DR.PARAM.appl.source.id
2	avisits	VisitID	varchar	30	2	ADM.PAT	main	ADM.PAT.um
3	avisits	AccountNumber	varchar	15	0	ADM.PAT	main	ADM.PAT.acct.number
4	avisits	Address1	varchar	75	0	ADM.PAT	pt.addr	ADM.PAT.pat.street
5	avisits	Address2	varchar	75	0	ADM.PAT	pt.addr	ADM.PAT.pat.street2
6	avisits	Affiliation	varchar	30	0	ADM.PAT	pt.other	ADM.PAT.affiliation
7	avisits	BedID	varchar	15	0	ADM.PAT	main	ADM.PAT.bed
8	avisits	BirthDateTime	datetime	10	0	ADM.PAT	main	ADM.PAT.birthdate
9	avisits	City	varchar	75	0	ADM.PAT	pt.addr	ADM.PAT.pat.city
10	avisits	ClientID	varchar	44	0	ADM.PAT	pt.other3	ADM.PAT.refer.client
11	avisits	Confidential	varchar	1	0	ADM.PAT	pt.other4	ADM.PAT.confidential



# Reporting Audit Discrepancies

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- Only send recent data discrepancies to MEDITECH; it makes it easier to troubleshoot and resolve
- Limit service issues to one table or related tables only
- Task descriptions should include the table name along with “Missing Row” or “Column Discrepancy”
  - Ex: 5.66 AdmVisits – Missing rows
- Attach the HTML report in your task or provide recent examples of missing primary keys from your SQL query



# Microsoft SQL Server

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MEDITECH	SQL 2017	SQL 2016	SQL 2014	SQL 2012
SQL version:	14.0	13.0	12.0	11.0
<u>Support ends:</u>	July 2022	July 2021	July 2020	July 2019

[Review MEDITECH's current list of supported SQL versions](#)



# What is an RDMS?

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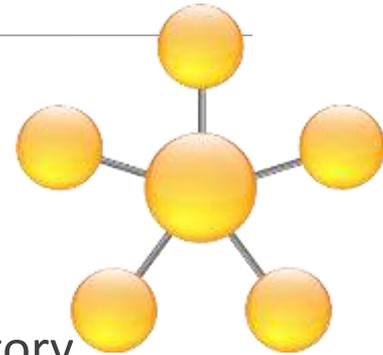
- A relational database management system...
  - Stores and manages related data to serve one or more applications
  - Allows data to be entered, edited, and deleted in tables
  - Manages data integrity
  - Offers secure access to information
  - Much more...



# SQL Server & Data Repository

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- DR is not a typical database (it's a relational database without relationships)
- The DR has 8,000+ tables as of 5.66, 15,000+ in 6.x
- Security is managed through SQL Server or Windows Active Directory (no connection to MIS user dictionary)
- The DR application includes SQL tables (including a Primary Key index) and stored procedure database objects
- Never modify your live and test DR databases – this will adversely affect your data transfers and data continuity
  - One exception: non-clustered indexes
  - Indexes should be backed up in a script file!
- Create SQL report objects (stored procedures, views, functions, etc.) in your own database



# SQL Server & Data Repository

The screenshot displays the Microsoft SQL Server Management Studio interface. The left pane shows the Object Explorer for the BEV-DRDB server, with the 'Tables' folder under the 'livedb' database selected. The right pane, titled 'Object Explorer Details', shows a list of tables in the 'livedb' database, including their names, schemas, and creation dates.

Name	Schema	Create Date
System Tables		
AbsAdmLocationsAndScus	dbo	7/31/2003 9:13 AM
AbsAdmRcrDates	dbo	11/17/2004 5:43 PM
AbsAdmRugs	dbo	7/25/2003 10:36 AM
AbsAdmServices	dbo	7/25/2003 10:36 AM
AbsAnesthesiaPhysicians	dbo	7/25/2003 10:36 AM
AbsAnesthesias	dbo	7/25/2003 10:36 AM
AbsApcCptModifiers	dbo	11/17/2004 5:43 PM
AbsApcCpts	dbo	5/25/2010 6:30 AM
AbsApcDates	dbo	11/17/2004 5:43 PM
AbsApcModifiers	dbo	11/17/2004 5:14 PM
AbsApcs	dbo	5/25/2010 6:12 AM
AbsCanAccounts	dbo	11/17/2004 5:43 PM
AbsCanadianData	dbo	7/25/2003 10:36 AM
AbsCanadianTherapy	dbo	7/25/2003 10:36 AM
AbsCanCorrectionFields	dbo	11/17/2004 5:14 PM
AbsCanCorrectionLists	dbo	11/17/2004 5:14 PM
AbsCanCorrections	dbo	11/17/2004 5:14 PM
AbsCanKeyEncountersNacrs	dbo	11/17/2004 5:14 PM
AbsCanKeyFields	dbo	11/17/2004 5:43 PM
AbsCanKeyRecurDatesNacrs	dbo	9/4/2008 1:36 PM
AbsCanKeyRecurVisitCenters	dbo	9/4/2008 1:36 PM
AbsCanKeyVisitCenters	dbo	11/17/2004 5:43 PM
AbsCanVisitAdmDxs	dbo	7/26/2011 1:16 PM
AbsCanVisitCenters	dbo	11/17/2004 5:14 PM
AbsCanVisitDiagnoses	dbo	11/17/2004 5:14 PM
AbsCanVisitDrgProcedures	dbo	11/17/2004 5:14 PM
AbsCanVisitEdDischargeDxs	dbo	7/26/2011 1:16 PM
AbsCanVisitProvider	dbo	11/17/2004 5:14 PM
AbsCharges	dbo	11/17/2004 5:43 PM

Tables  
7053 Items

# Server and Database Administration

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- Server Maintenance
  - Monitor overall disk space and usage
  - Perform full database backups nightly
- Suggested Regular Database Maintenance
  - Check data integrity
    - DBCC, SQL Maintenance Wizard
  - Analyze and address index fragmentation



are

# Database Administration

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- Disk space vs. database space
  - Make sure primary data drive has plenty of capacity for livedb growth
  - MT recommends keeping 25% of total disk space free (livedb – E: drive)
  - Database auto-growth options
    - Percentage vs. amount of space
    - Unrestricted vs. restricted space
- What happens when the drive is full?

# Database Administration

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- Table Indexes and fragmentation
  - SQL Maintenance Wizard can address this, but not intelligently
    - Indexes may be dropped and recreated
    - Every single table in the database is analyzed
  - Doing your own, targeted index maintenance is better
    - Assemble a list of tables you use for reports
    - Keep track of your own non-clustered indexes

# Rebooting the DR Server

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- Do not reboot the server without stopping the background jobs!
- What happens if you do?
  - Table sequences may be interrupted
  - Data might be skipped
  - Table initial loads (“IL’s”) may need to be done to re-sync data
- You can stop the background jobs by:
  - Calling MEDITECH
  - Stopping the jobs via MEDITECH MIS application (non-MAGIC)



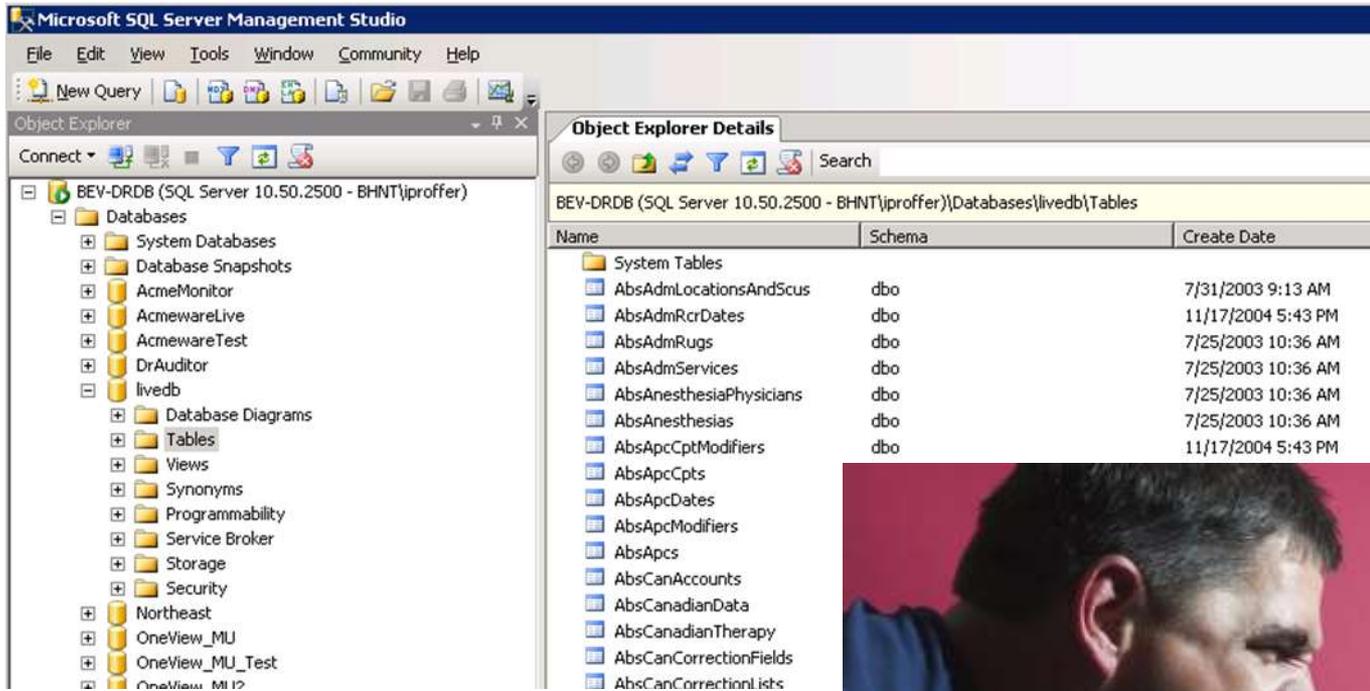
# SQL Server Management Studio

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- Microsoft Management Console (MMC) Application to manage SQL Server instances
- Use for enterprise-wide server & database administration
  - Database backups, create logins, monitor server performance, manage user access to databases
- Use to develop T-SQL code and database objects – the basis for reports
  - Stored procedures, views, user-defined functions



# Management Studio Demo



The screenshot displays the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows a tree view of the server instance 'BEV-DRDB (SQL Server 10.50.2500 - BHNT\iproffer)'. The 'livedb' database is expanded, showing its internal structure including System Tables, Views, and Synonyms. The Object Explorer Details pane on the right shows a table listing the system tables in the 'livedb' database, including their names, schemas, and creation dates.

Name	Schema	Create Date
System Tables		
AbsAdmLocationsAndScus	dbo	7/31/2003 9:13 AM
AbsAdmRcrDates	dbo	11/17/2004 5:43 PM
AbsAdmRugs	dbo	7/25/2003 10:36 AM
AbsAdmServices	dbo	7/25/2003 10:36 AM
AbsAnesthesiaPhysicians	dbo	7/25/2003 10:36 AM
AbsAnesthesias	dbo	7/25/2003 10:36 AM
AbsApcCptModifiers	dbo	11/17/2004 5:43 PM
AbsApcCpts		
AbsApcDates		
AbsApcModifiers		
AbsApcs		
AbsCanAccounts		
AbsCanadianData		
AbsCanadianTherapy		
AbsCanCorrectionFields		
AbsCanCorrectionLists		



# Using SSMS to Write T-SQL Code

---

- A Transact-SQL statement can be:
  - Entered as text
  - Auto-generated using the Query Designer
  - Loaded from an existing SQL Server stored procedure
  - Loaded from a file
  - Generated by scripting a SQL object
- Once designed, T-SQL Code can be:
  - Validated syntactically
  - Executed to produce a result set
  - Executed to create, modify, or delete a SQL Server object
  - Analyzed using with the Estimated Execution Plan to determine how the statement will be processed
  - Optimized with the Database Engine Tuning Advisor
- T-SQL Code can be saved:
  - As a SQL Server object (e.g., stored procedure, view, function)
  - As a SQL statement or script – typically in a project located on your file system or local drive



# Report Presentation Options

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# Presenting Your Data

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- SQL Server Reporting Services
  - Report Manager
  - Report Builder
  - Analysis Services
- Other Custom Report Products
  - SAP Crystal Reports
  - KRONOS Analytics
  - Cognos
- Third Party DR-Based Products



# Reporting Services (SSRS)

**Clinical Quality Measures ED Summary**

Home > OneViewTest > Memorial Hospital

Home | My Subscriptions | Site Settings | Help

SQL Server Reporting Services

## Meaningful Use

Report Data Search

New Folder | New Data Source | Report Builder | Folder Settings | Upload File | Details View

Analysis | Attestation | AttestationArchive

Dashboards | Validation

Toolbox: Report, Points, Text B, Line, Table, Matrix, Rectar, List, Image, Subres, Chart, Gauge, General

VTE-3	18	12	5	23	6	100.00	66
VTE-4	14	14	4	18	0	100.00	100
VTE-5	12	6	10	22	6	100.00	50
VTE-6	0	0	0	0	0	100.00	0

There are no use group. Drag an it add it to!

Data Compile Date: 3/15/2012 12:20 PM

Output Ready

# Soup to Nuts, DR 102: SQL Development

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- Finding Data
  - How can you find data in the DR?
- Organization
  - Database, Stored Procedures and Tables
- Efficiency
  - How to make your code run fast and more efficiently
- T-SQL TIPS
  - Helpful code tips



# Look for our MUSE sessions



- Tuesday, May 29
  - 702 - Custom BCA Dashboards with Visual Insight
  - 703 - The Alphabet Soup of Clinical Quality Measures Reporting and Reimbursement: 2018 Updates
  - 704 - Soup to Nuts - Data Repository 101
  - 802 - Report Designer Fundamentals
  - 804 - Soup to Nuts – Data Repository 102
- 1010 - Revenue Cycle Optimization: Tools and Strategies for Success  
Wednesday May 30 at 2:30 pm
- 1087 - HIE: Effective Integration and Interoperability  
Thursday May 31 at 1:45 pm
- 1104 - The DR Overnight DBA  
Thursday May 31 at 2:45 pm
- 1091 - Electronic Reporting: Quality Management Cycle Concepts that Achieve Reliable Results  
Friday June 1 at 9:00 am
- 1103 - The Report Request Lifecycle  
Friday June 1 at 10:00 am

