Outline

Discuss Microsoft reporting services architecture.

Create reports using Microsoft SSRS

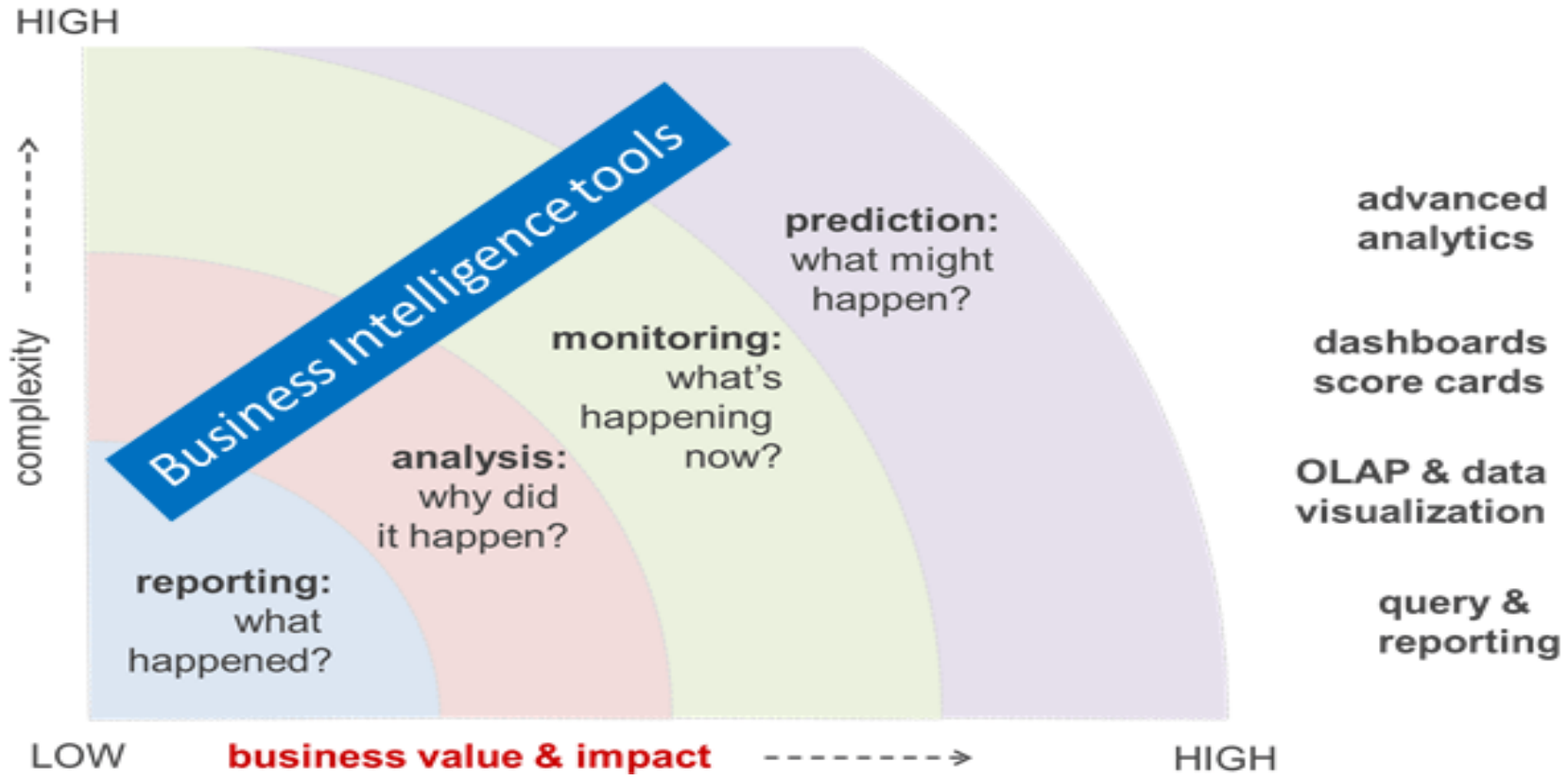
Review from last class (important concepts from ETL):
-most complex part of dwh

Cleansing “fuzzy” joins – where u kind of know the stuff around the data but it is not exact, e.g. joh or jon instead of john

Types of data sources e.g. cooperative vs non cooperative

Business Value & Impact Reporting

OLAP -> historical reports, looking at trends, subj oriented stuff, e.g. how we did last year, and the year before



Sample Reports

Hospital sample report
EoD report
Back end programming/processing

Daily Charges & Receipts

Evelyn Raith

Thursday, June 6, 2013

Printed June 6, 2013, 2:08:25PM

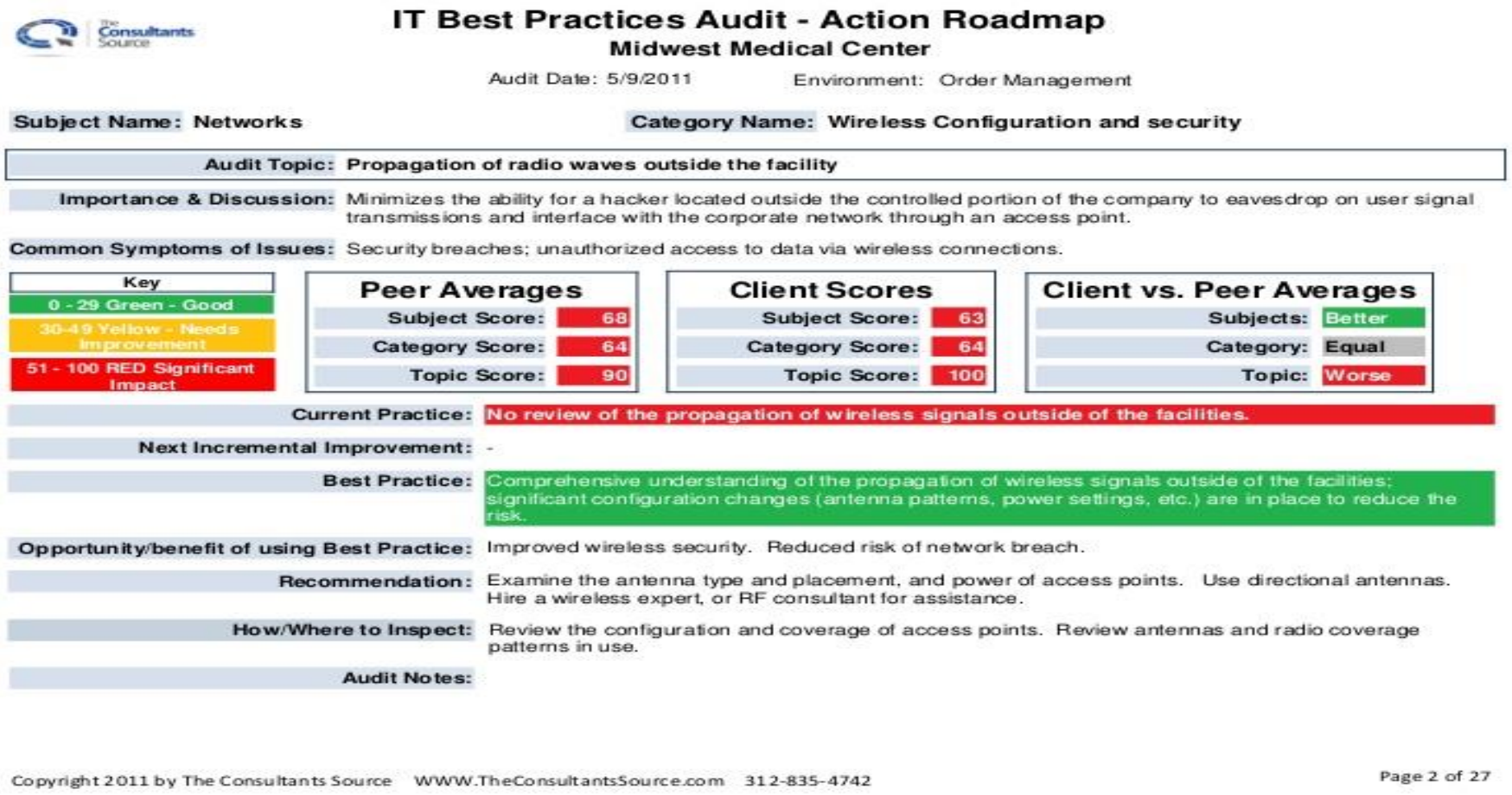
Patient Name	ICD	Prefix Code	Description / Invoice #		Insurance Fee	Insurance Pay	Patient Fee	Patient Pay	3rd Party Fee	3rd Party Pay	Payment	Visit Date
07-0173 Maddison, Angela	7240	PHY 9934	ICBC Physio Initial Visit #058431	IP	22.32		25.00					*
90-2813 Wishart, Wolfgang	7245	CHMSP 138	MSP Initial #058423	MP	23.00	13.00	13.00					*
90-0162 Adachi, Dermot A	7245	MSP 142	Accupuncture #058426	M	50.00							
90-0157 Alderdice, Ingejerd D	7245	WCB 19130	WCB Initial Visit chiro #058435	W	32.12							*
90-0364 Belfor, Shawn		CER 6	Invoice 058420	I	26.25							
00-0259 Edlund, Ellen	7245	BAL 13	Invoice 058429	W	20.00							
00-0116 Hartley, Hale	7245	THIRD 34245	3rd party #058425	3					50.00			*
00-0216 Smith, Brenda	7245	PHY 1	Physio #058436	3					100.00			*
90-2524 Townsend, Rosanna L	7245	WCB 19745	Invoice 058421	W	96.00							
02-0103 Ancil, Rene		CER 6	Invoice 058418	P			28.00	28.00			Cash	
90-0979 Bath, Derek	7245	CHI 138	Sub Chiropractic Visit #058415	P			42.00	42.00			Cash	*
90-0890 MacDonald, Linda		ICE 2	Invoice 058416	P			5.51	5.51			Cash	
99-0045 MacKerricher, Leonardc	7245	BAL 13	Invoice 058417	P			33.60	33.60			Cash	
07-0173 Maddison, Angela		ORT 4	Invoice 058433	P			3.94	3.94			Cash	
90-2071 Tolentino, Nicole	7245	CHI 130	Initial Chiropractic Visit #058419	P			78.75	78.75			Cash	*
00-0259 Edlund, Ellen	7245	LUM 13	Lumbar Seat Cushion #058428	P3			40.00			40.00	Cheque	
90-2813 Wishart, Wolfgang	7245	MAS 9920	Initial Massage Visit Private 30 Minute	P			63.00	63.00			Cheque	*
90-0162 Adachi, Dermot A	7245	PHY 9934	ICBC Physio Initial Visit #058424	IP	22.32		25.00	25.00			Debit	*
89-0216 Hart, Alauddin		PAY 0	Invoice 058427	P			10.00	10.00			M/C	
89-0216 Hart, Alauddin	7245	CHI 138	Sub Chiropractic Visit #058432	MP	23.00		10.50	10.50			M/C	*
90-2893 Barber, Mike N		TUB 18	Invoice 058430	P			15.00	15.00			Visa	
					315.01	13.00	393.30	315.30	150.00	40.00		

Evelyn Raith — **Patient Visits Billed** 10

WCB Fee	148.12		A/R	Till			Cards	Total Deposit	
ICBC Fee	70.89	Pay	Change	Cash	191.80	Debit	25.00	Cash	191.80
MSP Fee	96.00	13.00	302.01	Cheque	103.00	Visa	15.00	Cheque	116.00
Patient	393.30	315.30	78.00	InsCheque	13.00	M/C	20.50	Cards	60.50
3rd Party	150.00	40.00	110.00			Other	0.00	Direct	0.00
Total	858.31	368.30	490.01	Total	307.80		60.50		368.30

Samples cont’d

Dashboard report
Provides alerts, shows health of system, shows jobs running/ran statuses



The Consultants Source

IT Best Practices Audit - Action Roadmap

Midwest Medical Center

Audit Date: 5/9/2011 Environment: Order Management

Subject Name: Networks **Category Name:** Wireless Configuration and security

Audit Topic:	**Propagation of radio waves outside the facility**
Importance & Discussion:	Minimizes the ability for a hacker located outside the controlled portion of the company to eavesdrop on user signal transmissions and interface with the corporate network through an access point.
Common Symptoms of Issues:	Security breaches; unauthorized access to data via wireless connections.

Key
0 - 29 Green - Good
30-49 Yellow - Needs Improvement
51 - 100 RED Significant Impact

Peer Averages	
Subject Score:	68
Category Score:	64
Topic Score:	90

Client Scores	
Subject Score:	63
Category Score:	64
Topic Score:	100

Client vs. Peer Averages	
Subjects:	Better
Category:	Equal
Topic:	Worse

Current Practice:	No review of the propagation of wireless signals outside of the facilities.
Next Incremental Improvement:	-
Best Practice:	Comprehensive understanding of the propagation of wireless signals outside of the facilities; significant configuration changes (antenna patterns, power settings, etc.) are in place to reduce the risk.
Opportunity/benefit of using Best Practice:	Improved wireless security. Reduced risk of network breach.
Recommendation:	Examine the antenna type and placement, and power of access points. Use directional antennas. Hire a wireless expert, or RF consultant for assistance.
How/Where to Inspect:	Review the configuration and coverage of access points. Review antennas and radio coverage patterns in use.
Audit Notes:	

Sample cont’d

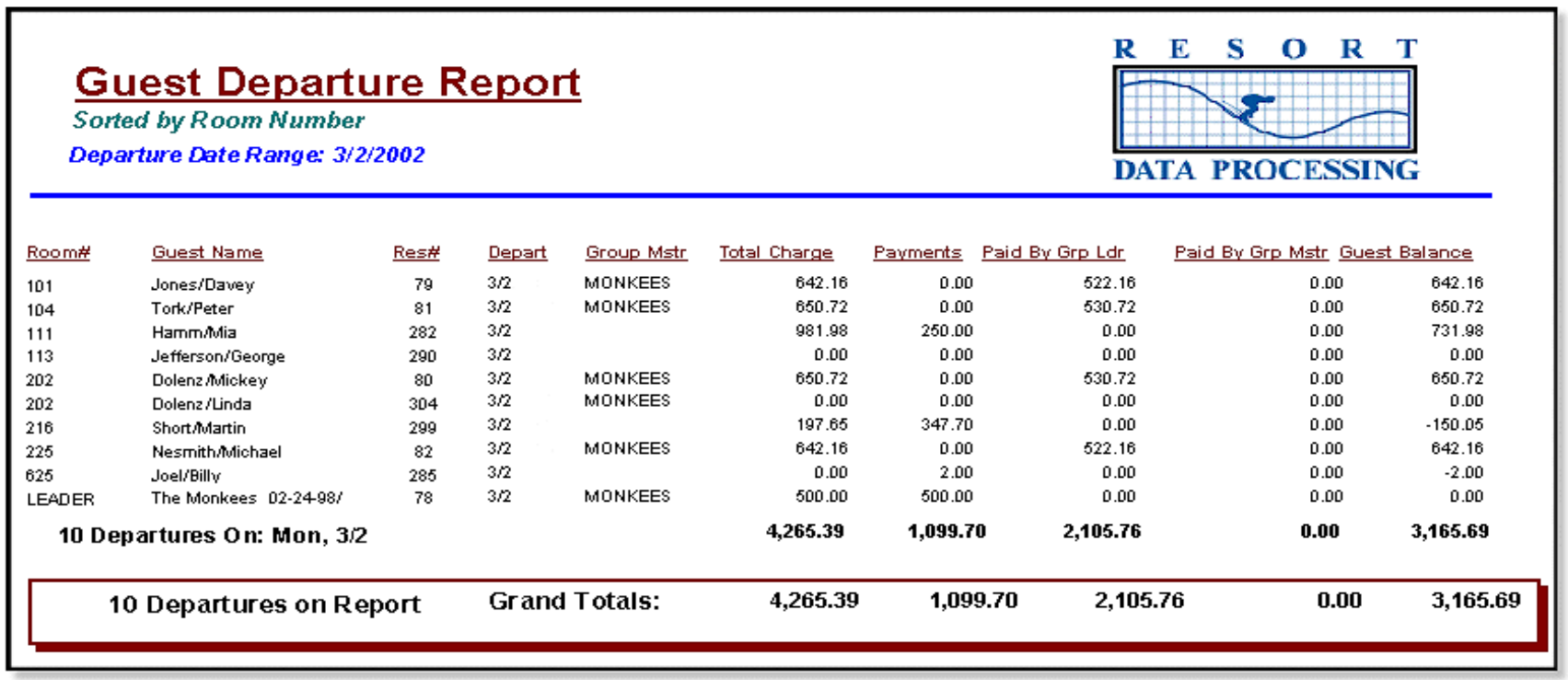
need to layout report first, set up the view with placeholders

```
EDIT --- REPORT: REPORT ------------------------------------- COLUMNS 001 0
COMMAND ===>                                                  SCROLL ===> CSR
****** ***************************** TOP OF DATA ********************************
000100                   WONDERFUL WIDGETS INCORPORATED
000200
000300                            STOCK REPORT
000400
000500                             XXXXXX XXX
000600
000700                            MID ATLANTIC
000800                            STOCK REPORT
000900                             XXXXXX XXX
001000
001100 LOCATION          LAST COUNT     QUANTITY IN    QUANTITY      QUANTITY
001200                     DATE           STOCK         ISSUED       RECEIVED
001300
001400 XXXXXXXXXXXX       99/99/99         ZZZ,ZZ9       ZZZ,ZZ9       ZZZ,ZZ9
001500
001600                                     --------      --------      --------
001700 TOTAL BY LOCATION:                  Z,ZZZ,ZZ9     Z,ZZZ,ZZ9     Z,ZZZ,ZZ9
001800
001900 TOTAL NUMBER OF SALES BY LOCATION:       ZZZ,ZZ9
****** ***************************** BOTTOM OF DATA *****************************
```

Report sample cont’d

As a dev, u build packages and provide them to customers e.g. a resort/hotel

Ur packages need to be able to generate reports such as these



Guest Departure Report

Sorted by Room Number

Departure Date Range: 3/2/2002

RESORT DATA PROCESSING

Room#	Guest Name	Res#	Depart	Group Mstr	Total Charge	Payments	Paid By Grp Ldr	Paid By Grp Mstr	Guest Balance
101	Jones/Davey	79	3/2	MONKEES	642.16	0.00	522.16	0.00	642.16
104	Tork/Peter	81	3/2	MONKEES	650.72	0.00	530.72	0.00	650.72
111	Hamm/Mia	282	3/2		981.98	250.00	0.00	0.00	731.98
113	Jefferson/George	290	3/2		0.00	0.00	0.00	0.00	0.00
202	Dolenz/Mickey	80	3/2	MONKEES	650.72	0.00	530.72	0.00	650.72
202	Dolenz/Linda	304	3/2	MONKEES	0.00	0.00	0.00	0.00	0.00
216	Short/Martin	299	3/2		197.65	347.70	0.00	0.00	-150.05
225	Nesmith/Michael	82	3/2	MONKEES	642.16	0.00	522.16	0.00	642.16
625	Joel/Billy	285	3/2		0.00	2.00	0.00	0.00	-2.00
LEADER	The Monkees 02-24-98/	78	3/2	MONKEES	500.00	500.00	0.00	0.00	0.00
10 Departures On: Mon, 3/2					**4,265.39**	**1,099.70**	**2,105.76**	**0.00**	**3,165.69**
10 Departures on Report				**Grand Totals:**	**4,265.39**	**1,099.70**	**2,105.76**	**0.00**	**3,165.69**

RPG

Missing more info from slide, look this up online

G.P.L
-C#
-C++
…
4GL
R.P.G
Crystal Reports, google this

- RPG is a high-lvl prog lang (HLL) for business apps
- Is a IBM proprietary lang avail only on IBM OS/400-based sys
- Dev by IBM in 1959 as the Report Program Generator – tool to replicate punched card processing on IBM 1401
- Updated to PG II for the IBM System/3 in the late 1960s, since evolved into HLL equivalent for COBOL

RPG

- Find sample file online, don’t need to know this on the test

RPG...

Book doesn’t detail how hard it is to generate reports, peter wanted to give examples using RPG

- Cont’d from prev slide, examples of RPG code

Microsoft Business Intelligence

Business Productivity Suite

Microsoft® Office

Business Collaboration Platform

Microsoft® SharePoint® 2010

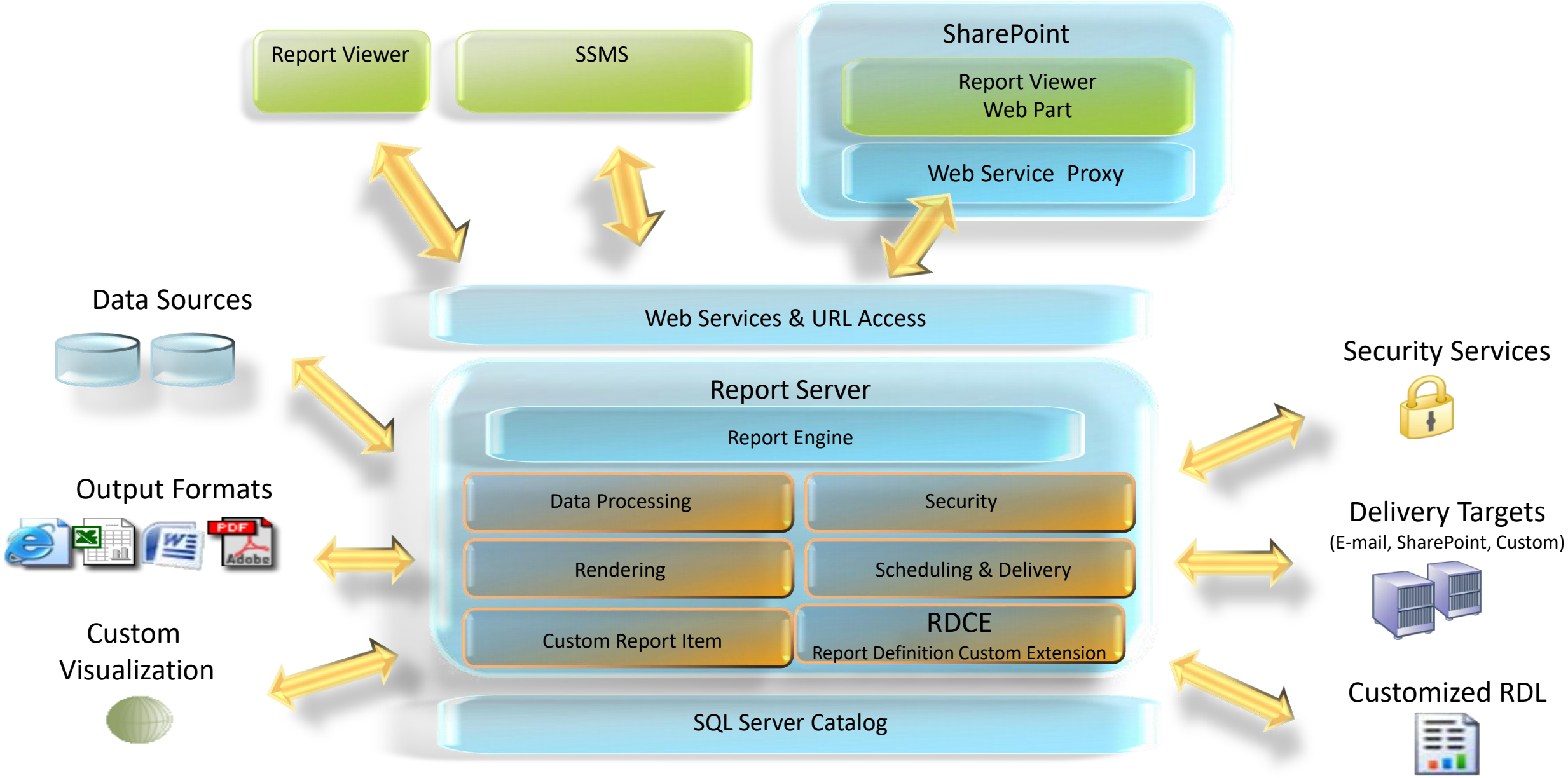
Information Platform

Microsoft® SQL Server® 2008 R2

MS BI Stack
Link demo capabilities to products

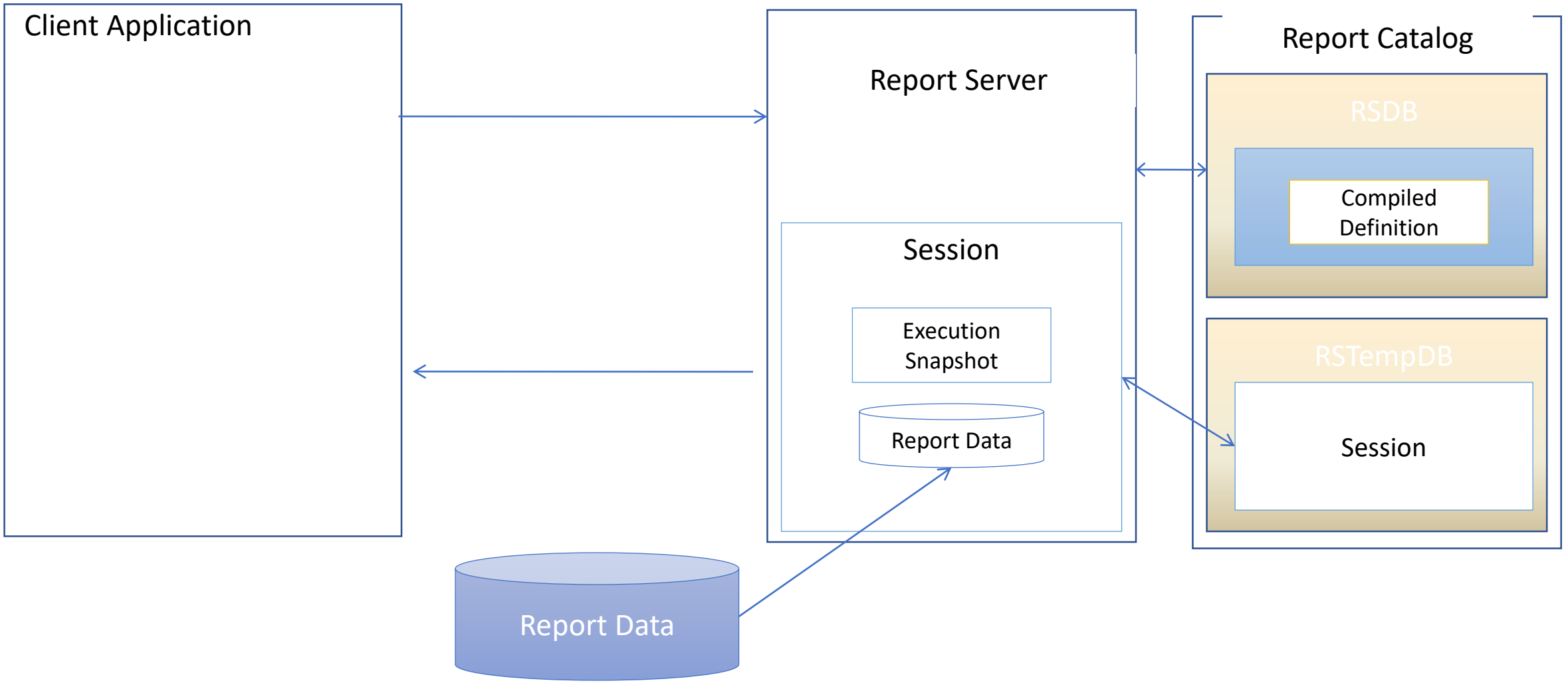
SSMS – Sql server management studio

Reporting Services Architecture



Reporting Services

How Report Execution Works



Highlights of Reporting Services – reporting life cycle

- **Authoring**
  - Wide range of supported data sources
  - Open report authoring options
  - Flexible report designs
- **Management**
  - Parameterized reports
  - Execution properties
  - Report scheduling and history
  - Role-based security
- **Delivery**
  - Range of rendering options
  - Flexible and extensible delivery

Managing Reports

- Publish reports to a centralized report server database
- General report management tasks:
  - Define execution schedule–on demand or in advance
  - Set up security
  - Maintain report folders
  - Administer user features
- Management roles
  - Content manager
  - System administrator

e.g. of a security role provided by peter since he worked on this before
Sys administrator
Network
Services

Create users under each of these roles to grant them permissions to the reports

Security is a big problem as data is sensitive

Reporting Services Scenarios

- Internal reporting
  - Departmental
  - Corporate
- External reporting
  - Business to business
- Embedded reporting
  - Portals
  - Applications

SSRS Components

Data Sources ...

- ★ Microsoft SQL Server
- ★ Microsoft SQL Server Analysis Services
- ★ Microsoft Access
- ★ OLE DB
- ★ ODBC
- ★ Oracle
- ★ XML

OLE DB (Object Linking and Embedding, Database, sometimes written as OLEDB or OLE-DB), an API designed by Microsoft, allows accessing data from a variety of sources in a uniform manner.

Older way is ODBC

Technically speaking, ODBC (Open Database Connectivity) is designed to provide access primarily to SQL data in a multi-platform environment. OLE DB (Object Linking and Embedding Database) is designed to provide access to all types of data in an OLE Component Object Model (COM) environment.

Maybe ~80% of data is in XML –Peter bhola
Need a way of querying that data

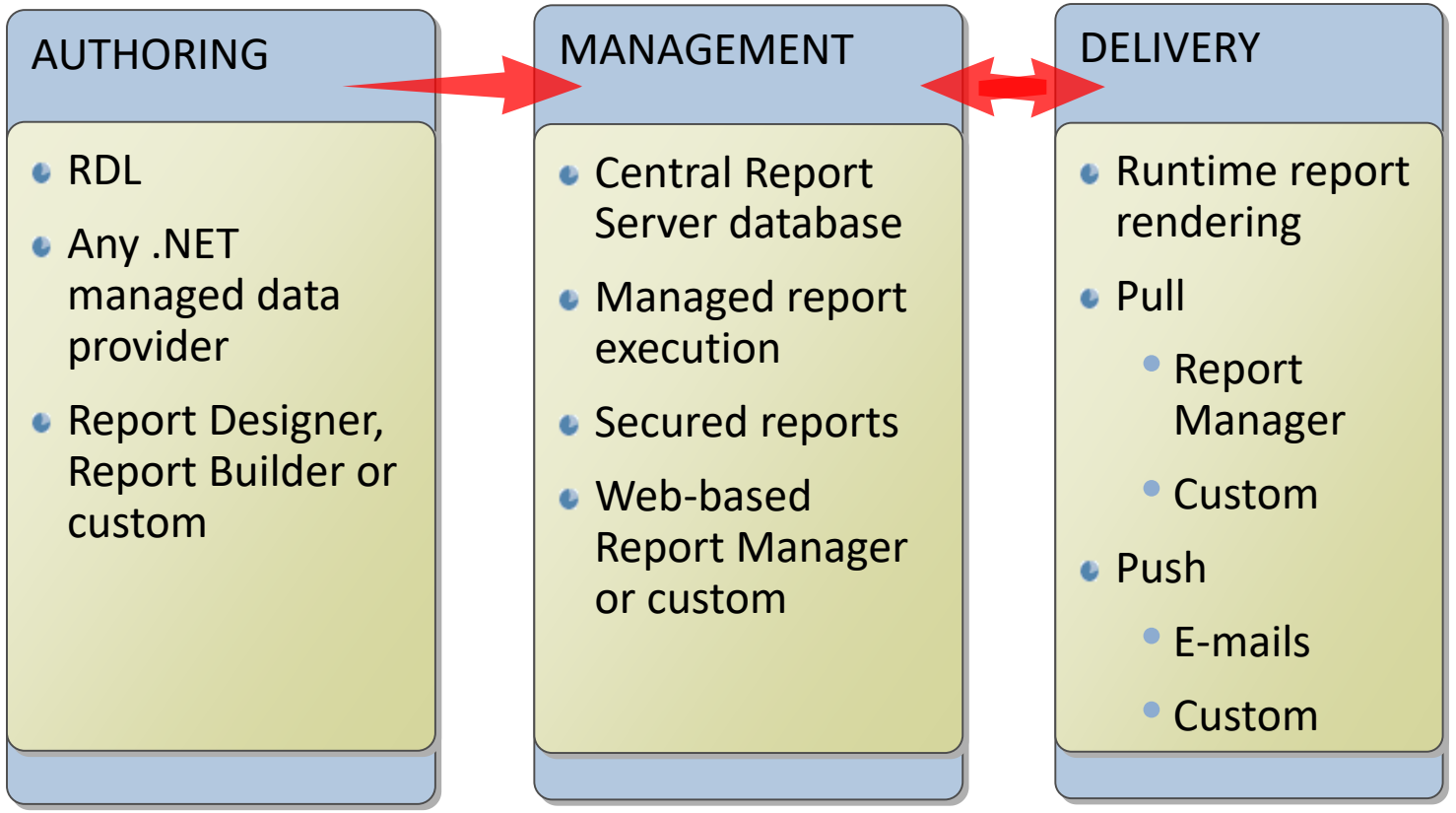
Delivering Reports

- Runtime rendering (cannot decide format ahead of time)
  - Web – HTML, MHTML
  - Print – PDF, TIFF
  - Data – CSV, Excel, XML
- Pull delivery – User issues report request
  - Report Manager
  - Custom
- Push delivery – Report is automatically distributed to user
  - E-mail
  - File
  - Custom

MHTML (short for MIME HTML) is a file extension for a Web page archive file format as saved by Internet Explorer. The archived Web page is an MHTML document.MHTML saves the Web page content and incorporates external resources, such as images, applets, Flash animations and so on, into HTML documents.

Custom made format may be something like the format used by Quickbooks (popular accounting/money management system used by banks)
Quickbooks used for income tax too, compatible with turbotax

The Reporting Lifecycle



Authoring
Wide range of supported data sources
Open report authoring options
Flexible report designs
Management
Parameterized reports
Execution properties
Report scheduling and history
Role-based security
Delivery
Range of rendering options
Flexible and extensible delivery

Need to use VPN for delivery, shouldn't simply use email

SSRS Components

Data Sets ...

- ⋆ Mapping of Report Fields to Data Source
- ⋆ Query Definition
- ⋆ Result Set Schema

SSRS Components

Reports ...

- ★ Tabular
- ★ Matrix / Crosstab / Pivot
- ★ Charts / Graphs
- ★ Report Definition Language (RDL)

RDL can be modified outside SSRS, but not recommended!

SSRS Components

Output Formats ...

- ★ HTML
- ★ Excel
- ★ CSV
- ★ PDF
- ★ XML
- ★ Word
- ★ TIFF File
- ★ MHTML (Web Archive)
- ★ Custom

HTML: Good for display
Excel: Good for subsequent changes and manipulations
CSV: Good for exporting data behind the scene in comma-delimited format (NOT the presentation of the report)
PDF: Good for printing
XML: Good for exporting data behind the scene to another system

SSRS Components

Delivery Targets ...

- ★ E-mail
- ★ File Share
- ★ Custom

SSRS Components

Delivery Targets ...

- ★ E-mail
- ★ File Share
- ★ Custom

SSRS Components

Meta Data Database ...

- ⋆ Reports and Data Sources
- ⋆ Users and Permissions
- ⋆ Scheduling and Distribution

With Reporting Services, we can create following types of reports:

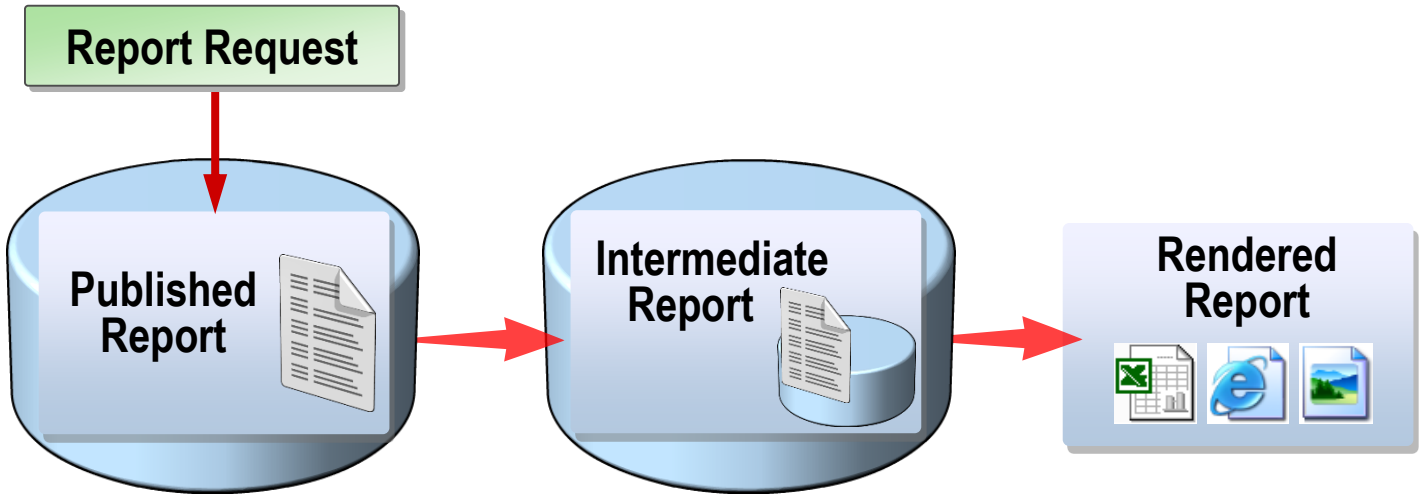
- Parameterized reports - used for filtering reports data
- Linked reports - provides an access to an existing report
- Snapshot reports - query results that were retrieved at a specific time
- Cached reports - saved copy of a processed report
- Ad hoc reports - created from an existing Report Model
- Drilldown reports - initially hide complexity and enable the user to toggle conditionally
- Drillthrough reports - accessed through a hyperlink on a report item in the original report
- Subreports - displays another report inside the body of a main report

Reporting Services

- Executing Reports On-Demand
- Executing Cached Instances
- Executing Snapshot Reports
- Subscriptions
- Rendering Reports Using URL Access
- Report Printing in Windows Applications

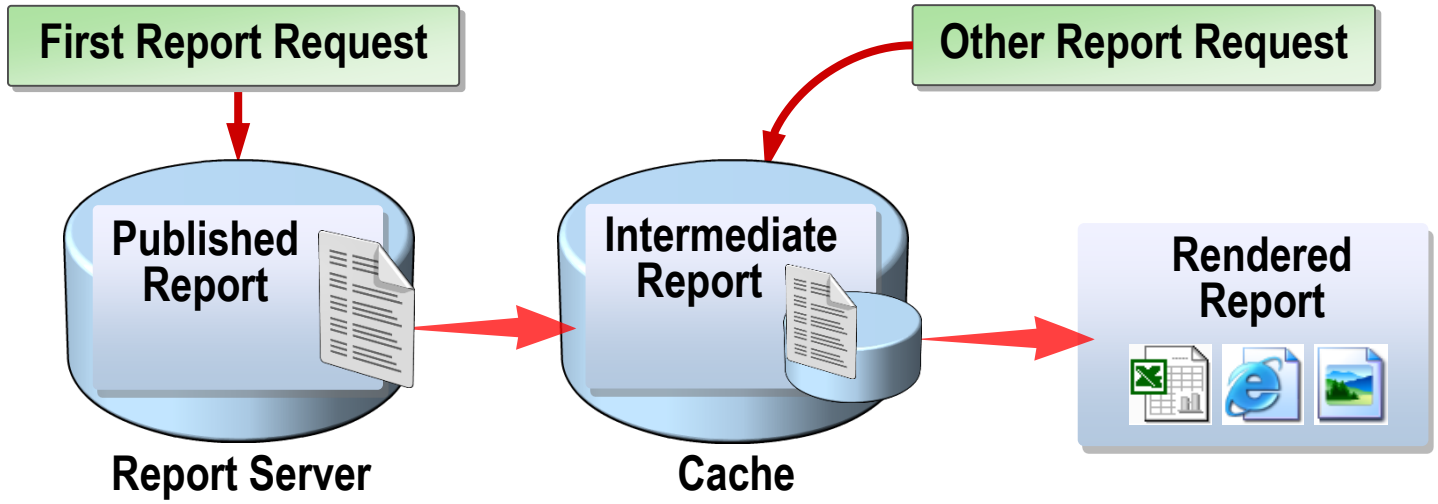
Executing Reports On-Demand

- Every report request triggers the same execution process:
  - Retrieves up-to-date data and processes report
  - Creates intermediate report and temporarily stores result in the session cache in ReportServerTempDB
  - Renders using intermediate report



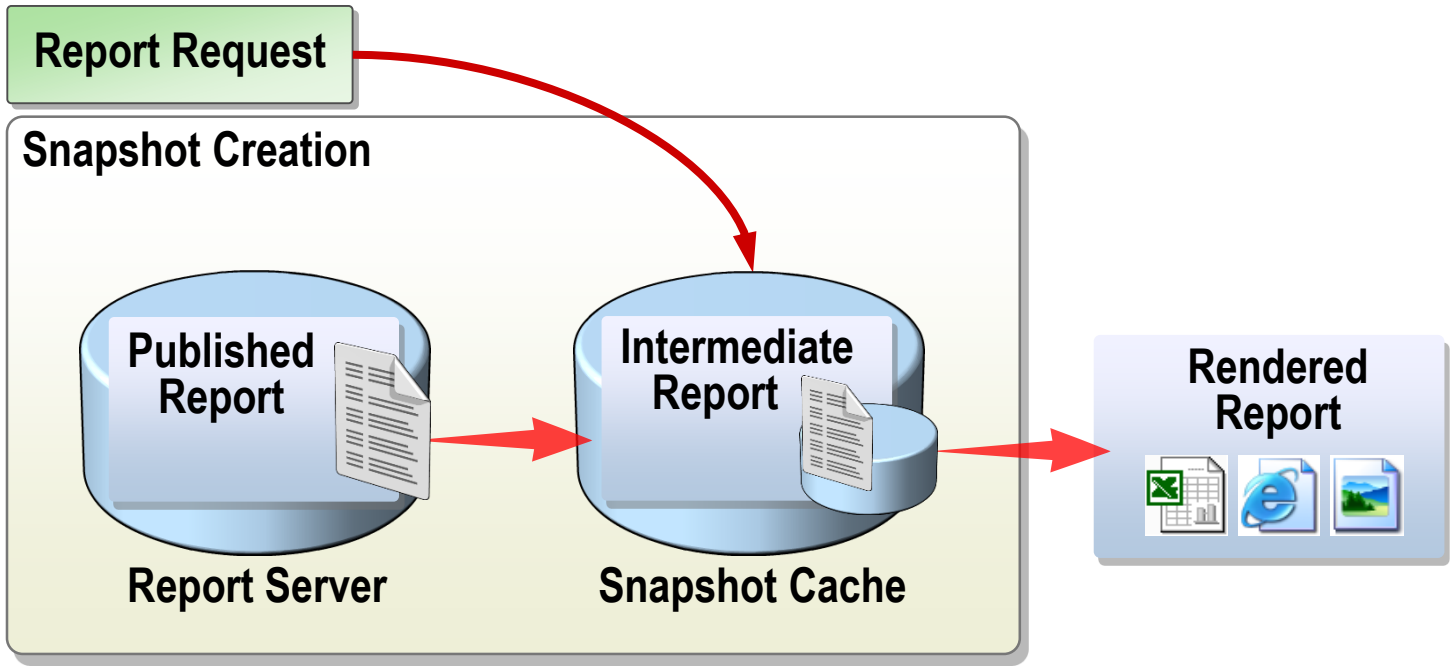
Executing Cached Instances

- Initial request triggers execution process (subsequent requests only use step 4)
  1. Retrieves most up-to-date data and processes report
  2. Creates intermediate report and stores intermediate result in the cache in ReportServerTempDB
  3. Flags intermediate report as a cached instance
  4. Renders report from cached instance



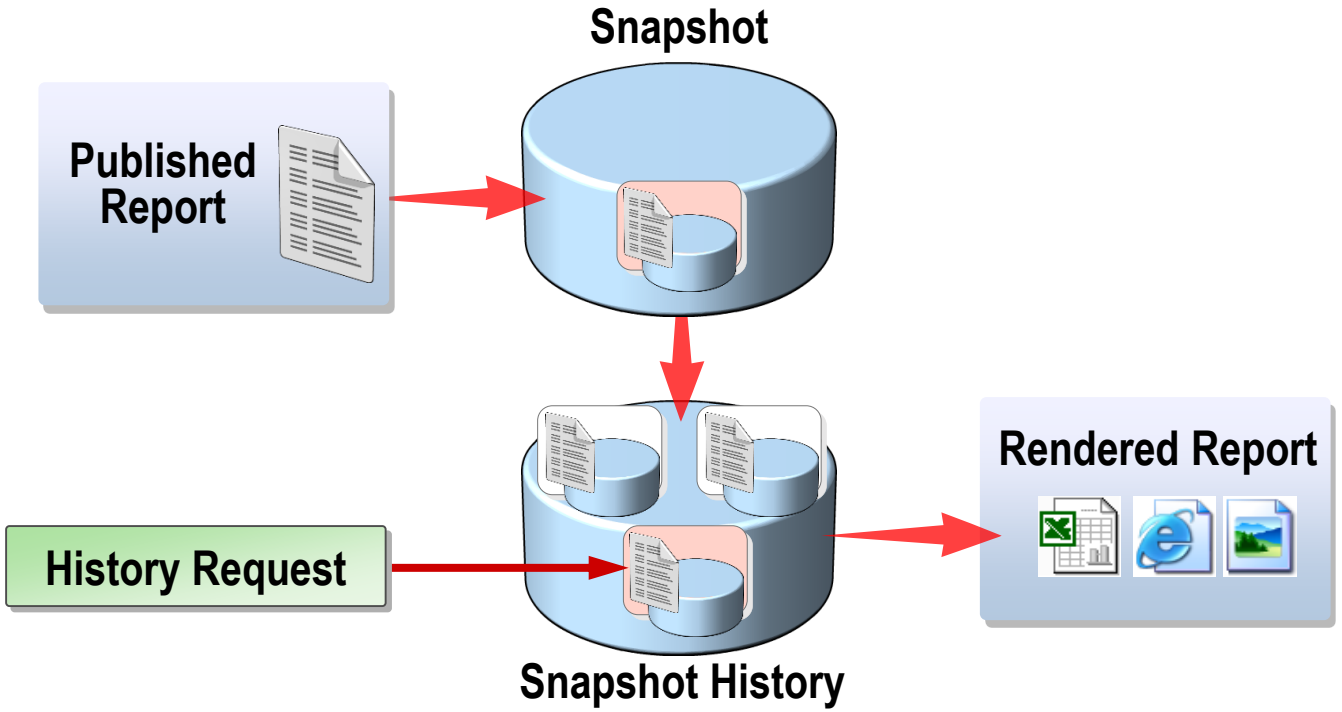
Executing Snapshot Reports

- Data retrieval and processing occurs in advance of report browsing
  1. Scheduled event occurs
  2. Creates the intermediate report and stores result as a snapshot in the report server database
  3. Requests are satisfied by retrieving and rendering the snapshot



Using Report History

- Report histories store snapshots for future reference
- History requests are satisfied by retrieving a specific historical snapshot



Subscriptions

- Mechanisms to execute and deliver rendered reports
- Two types of subscriptions:
  - Standard – end-user driven
  - Data-driven – administrator driven
- Default delivery extensions:
  - E-mail (SMTP)
  - File share

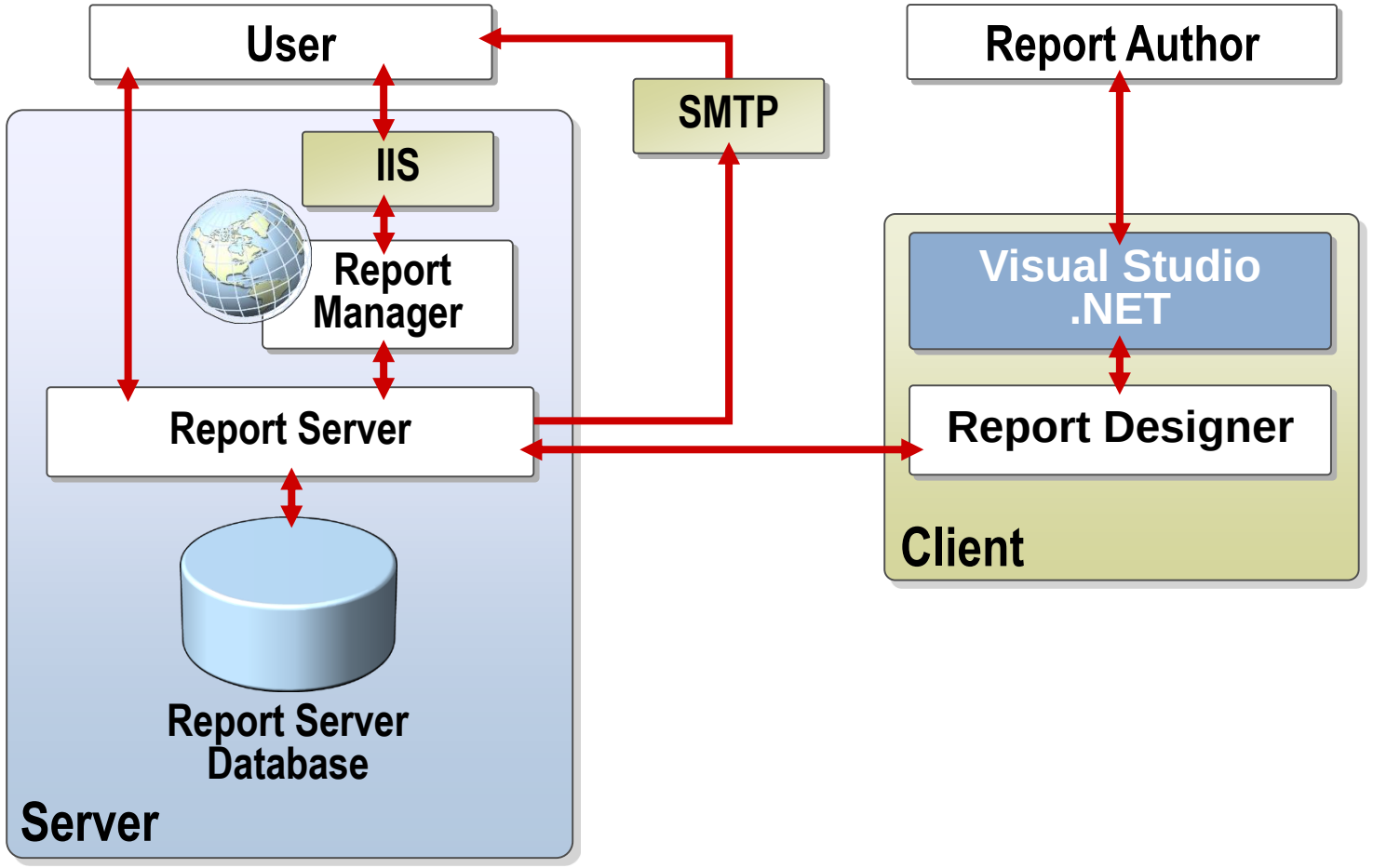
Report Development / Authoring

- Create RS Project
  - Visual Studio
  - SQL Server BI Development Studio
- Create Report
  - Data Source
  - Query
  - Fields / Layout
- Preview
- View Code (in XML)
- Deploy

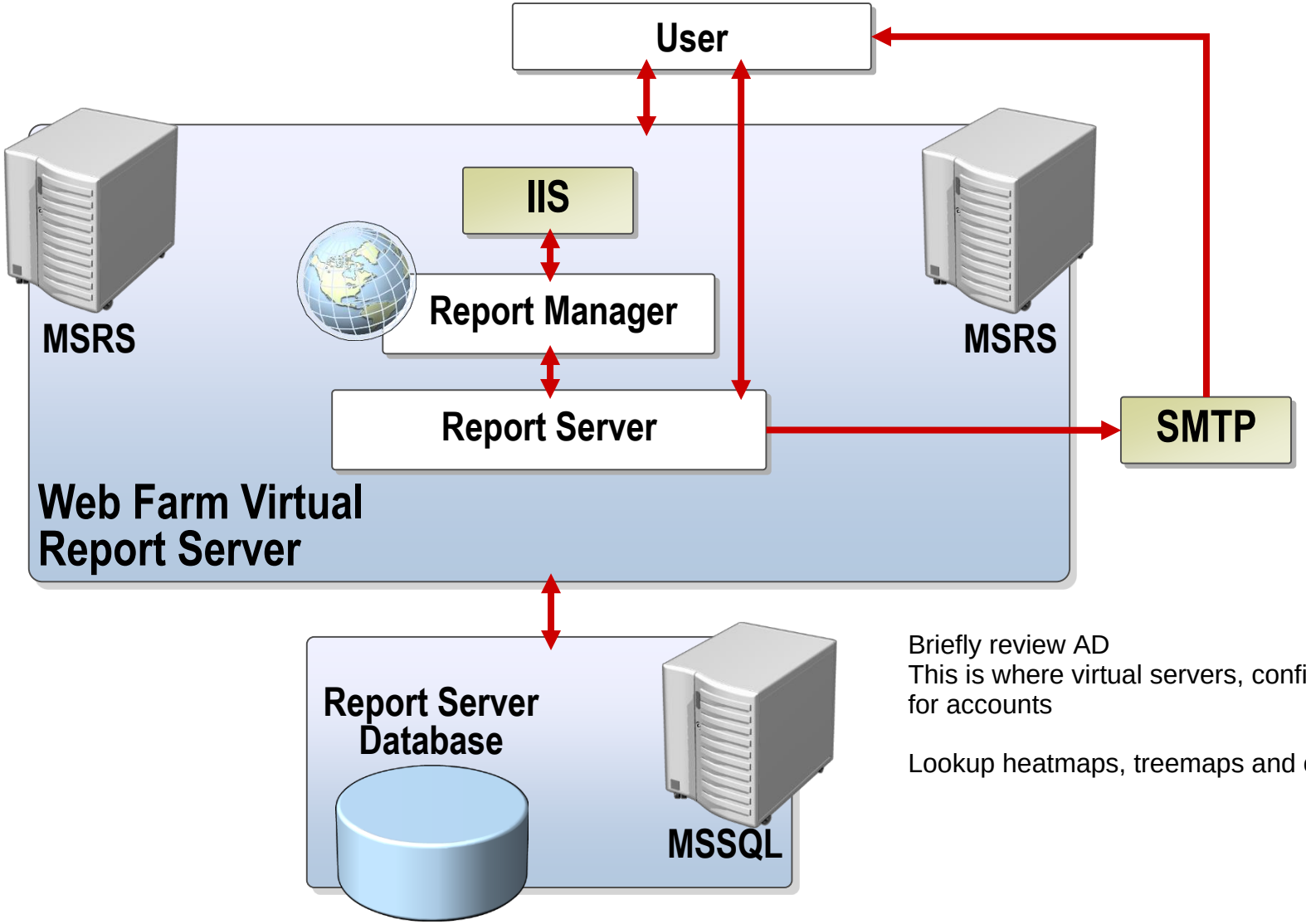
Report Development / Authoring

- Create RS Project
  - Open Visual Studio
  - File – New Project – Business Intelligence Projects
  - Report Server Project Wizard
  - Set the Name:

Single Server Deployment



Web Farm Deployment



Briefly review AD
This is where virtual servers, configured alongside security permissions for accounts

Lookup heatmaps, treemaps and other visualization techniques