Enterprise Reporting with SQL Reporting Services

- Management and Scalability –

Ashvini Sharma
Senior Program Manager
SQL Server
Microsoft
Agenda

- Reporting Services Architecture
- SharePoint Integration with SP2
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Reporting Services Components

Report Manager

URL Access

SOAP Endpoints

WMI

Shared Components

Data

Rendering

Security

Browser

Design Tools

Management Studio

Configuration Tool

Web Service
(IIS / ASP.NET)

Windows Service
Delivery

SQL Server Database / SQL Server Agent

ReportServer

ReportServerTempDB

Reporting Services Native Mode
Agenda

- Reporting Services Architecture
- SharePoint Integration with SP2
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Separate content stores
Different security models
Different management UI
Not deployable outside of firewall

No filter web parts

Limitations
SSRS Integration with SharePoint ‘v2’

- Report Explorer allows users to browse and subscribe to reports
- Report Viewer allows for users to view and navigate reports

Limitations

- Separate content stores
- Different security models
- Different management UI
- Not deployable outside of firewall
- No filter web parts
SQL Server 2005 Reporting Services SP2 integrates with Windows SharePoint Services to enable publishing, viewing, and management of rich reports.

Office SharePoint Server 2007 “Lights Up”
- Report library integration of Reporting Services functionality
- Rich reports in Dashboards with filter Web Parts

Integration Benefits
- New services for WSS and Office SharePoint 2007 Servers
- Integrated User Experience for Reporting Services users
Agenda

- Reporting Services Architecture
- SharePoint Integration with SP2
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Reporting Services setup in Microsoft SQL Server 2005 has two modes:

- Default Configuration
- Files Only Installation

Default configuration assumes you want to:

- Install on default web site
  (will create new App Pool in Microsoft Windows 2003)
- Install relational database in same instance
- Use service accounts for database connection

Configurations requiring files only setup:

- Remote catalog database
- Scale out deployment (a.k.a. Web farm) installation
- SharePoint Integration mode

Client Setup includes the Microsoft Visual Studio 2005 shell (Business Intelligence Development Studio)
Configure Report Server

Report Server Status

Use the Reporting Services Configuration tool to configure a report server deployment. Click an item in the navigation pane to open a configuration page.

Use this page to start or stop the Report Server Windows service.

Instance Properties

- Instance Name: MSSQLSERVER
- Instance ID: MSSQL.3
- Initialized: Yes
- Service Status: Running

Start | Stop

Legend

- Configured
- Not configured
- Optional configuration
- Recommended configuration

Help | Apply | Exit
Management and Configuration Tools

- Report Manager
  - Web-based viewing and management application
- SQL Server 2005 Management Studio
  - Superset of Report Manager functionality
- Reporting Services Configuration Tool
  - Windows-based tool for local or remote configuration of service
- Client utilities
  - Script Host
  - Encryption Key Management
- Custom applications
- Windows SharePoint Services / Microsoft Office SharePoint Server 2007
  - Enabled in SP2
Report Management
Reporting Services SharePoint Mode

- Reports, data sources, and report models are published to SharePoint document libraries
  - When a report is selected in WSS, the report viewer Web Part calls the report server API to process and render the report
  - Users can manage properties and subscribe to reports through WSS UI (calls RS SOAP API)
  - UI includes ability to launch Report Builder to create / edit reports

- New report server delivery extension allows for rendered reports to be delivered to WSS document libraries (including Report Center)

- Design tools (Report Designer, Report Builder, Model Designer) are updated to work with WSS

- Report Manager is not supported in SharePoint Integration Mode
Agenda

- Reporting Services Architecture
- SharePoint Integration with SP2
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Role-Based Security Model

- **Tasks**
  - Sets of low-level operations
  - Item-level (for example, create report) or system-level (for example, manage jobs)
  - Not customizable

- **Roles**
  - Sets of tasks
  - Default roles installed by default (browser, publisher)
  - Default roles can be customized, new ones created
  - Roles identified by name, localized

- **Groups/users**
  - Windows/Active Directory or custom authentication users

- **Role assignments**
  - Associates groups/users with Roles
  - Inherited from parent in namespace
  - SharePoint Integrated Mode in SP2 maps to WSS permissions
Agenda

- Reporting Services Architecture
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Report Management

- Report Metadata is extracted from report definition at publishing and maintained in the database

Name

Description

Report Definition

Parameters

- Prompt vs. Hide
- Prompt String
- Default Values

Data Source Information
(embedded or reference to shared data source)
Administrator can set connection type and connection string after publishing

Credential Options
- Prompt for Windows or database credentials
- Securely stored Windows or database credentials
- Integrated Security
  (Requires Kerberos delegation; can be disabled in “SQL Server Surface Area Configuration”)
- None (uses report execution account; enabled in Configuration Tool)

Shared Data Sources
- Connection and credential information stored as a secured object in the namespace
- Single point of management for multiple reports
- SharePoint Integration Mode in SP2 can use .RSDS or .ODC files
Report Caching

Execution sessions
- Automatically created for each report execution
- Keeps consistency between server round trips (images, paging, exporting)
- Session timeout set in server properties

Cache snapshots
- On-demand reports can be cached between users
- Cache index is based on parameter values
- Cache valid for a specified time after execution or cleared on schedule
- Limitations – User-specific expressions (User ID, Language), stored credentials

Tip: Use Null Delivery Provider to deliver reports to cache
Snapshots and History

Execution snapshot
- Report execution is scheduled, all users get same data
- Single instance of processed report
- Limitations: No query parameters or user-specific expressions, stored credentials

History snapshots
- Multiple instances of report snapshots for archiving, auditing purposes
- Stored independently of data source, report definition
- System and report-specific retention policy
Managing Report Execution

- Configure cache and snapshots via Report Manager or SQL Management Studio
- Set execution timeouts on a system-wide or per-report basis
- Long running reports can be stopped manually
- Report Execution Log enables analysis of server usage
  - Optionally, executions are logged to Report Server database
  - Includes report, format, user, start, end, cache hit, size
- Setup includes SSIS package and sample reports
Agenda

- Reporting Services Architecture
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Management events can be scheduled on the report server
- Caching, Subscriptions, History

Schedules are stored in database and integrated with SQL Agent
- When triggered, Agent adds entry to queue

Scheduled events are queued in database and polled by Windows service
Subscriptions

Subscription triggered by an event (schedule, snapshot creation, external)

Delivery extension (e-mail, file share) specifies how report is delivered
- E-mail delivery requires an SMTP server
- Extensible delivery architecture

Can specify output format (HTML, XLS)
- Can deliver links as well as rendered reports

Two types of subscriptions
- Standard
- Data Driven
Standard Subscriptions

- Single report sent to a fixed set of addresses
  - End user wants to customize his/her own report delivery

How it works

- Set up by a user with ‘Manage Individual Subscriptions’ permission
- User creates a standing request to run a report at a specific time and delivered in a certain format
- Can be triggered based on a schedule or snapshot generation
- Specify report, execution conditions, parameters, rendering format, delivery location, etc.
Data Driven Subscriptions

When to use
- Delivery of a report to a dynamic list of destinations with customized content for each destination

How it works
- Set up by a user with ‘Manage any Subscriptions’ permission
- Define delivery query to return list of destinations and parameters
- Specify delivery settings and parameter values as a static or field from delivery query
- Set to run according to a defined schedule or trigger from snapshot

Data driven subscriptions require SQL Server Enterprise Edition!
Agenda

- Reporting Services Architecture
- Setup and configuration
- Securing your report server
- Report and model management
- Scheduling and subscriptions
- Scale out
Scale Out Deployment

Data Sources
- Oracle
- SQL Server
- DB2
- Flat Files, OLE DB, ODBC

Report Metadata and Cache Failover Cluster
- SQL Server
- Windows Server

Reporting Services Scale Out Deployment
- IIS
- Report Server
- Windows Server

Clients
- NLB

Scale out requires SQL Server Enterprise Edition!
Run setup (files only) to install first report server instance
Run setup (files only) to install second report server instance
Use configuration tool to create report server database and configure first report server instance
Use configuration tool to configure second report server instance
Install and configure load balancing functionality (NLB, switch)
General “Care and Feeding” of your Report Server is easy!

- Once initial configuration has been finished, many users can manage content themselves

Complex configurations will require planning

- Network infrastructure
- Security architecture
- Deployment policies
- Scalability requirements

SharePoint integrated mode in SP2 requires understanding of WSS management as well
<table>
<thead>
<tr>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting Services Product Site</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Logging and Monitoring

- Performance monitoring
  - Counters for performance
  - Report Execution for analysis
- Event log integration
  - Critical events and errors
- Trace events
  - Can trace all server activities, response times, security events
  - Detail level depends on configuration setting
- Server Watson support
Automating Repetitive Tasks

Examples
  - Duplicate settings between servers
  - Migrate from test to production Environment
  - Change shared data sources
  - Cancel running jobs

Automate web service tasks through Report Server Script Host (RS.EXE)
  - Visual Studio .NET not required for execution
  - Need to run as user with all permissions
Server Configuration Files

- Unique per Report Server – not transferable
  - Configuration (including extensions) should be same per machine in scale-out deployment

- Specific areas of interest
  - Report Server database connection
  - Report Execution account and password
  - Extension Configuration (including E-mail Delivery)

- Use Configuration Tool, text editor or command line utilities to modify
  - File monitoring updates server settings

- Code Access Security (CAS) for extensions stored in separate file