Enterprise Reporting with SQL Reporting Services

- Management and Scalability –

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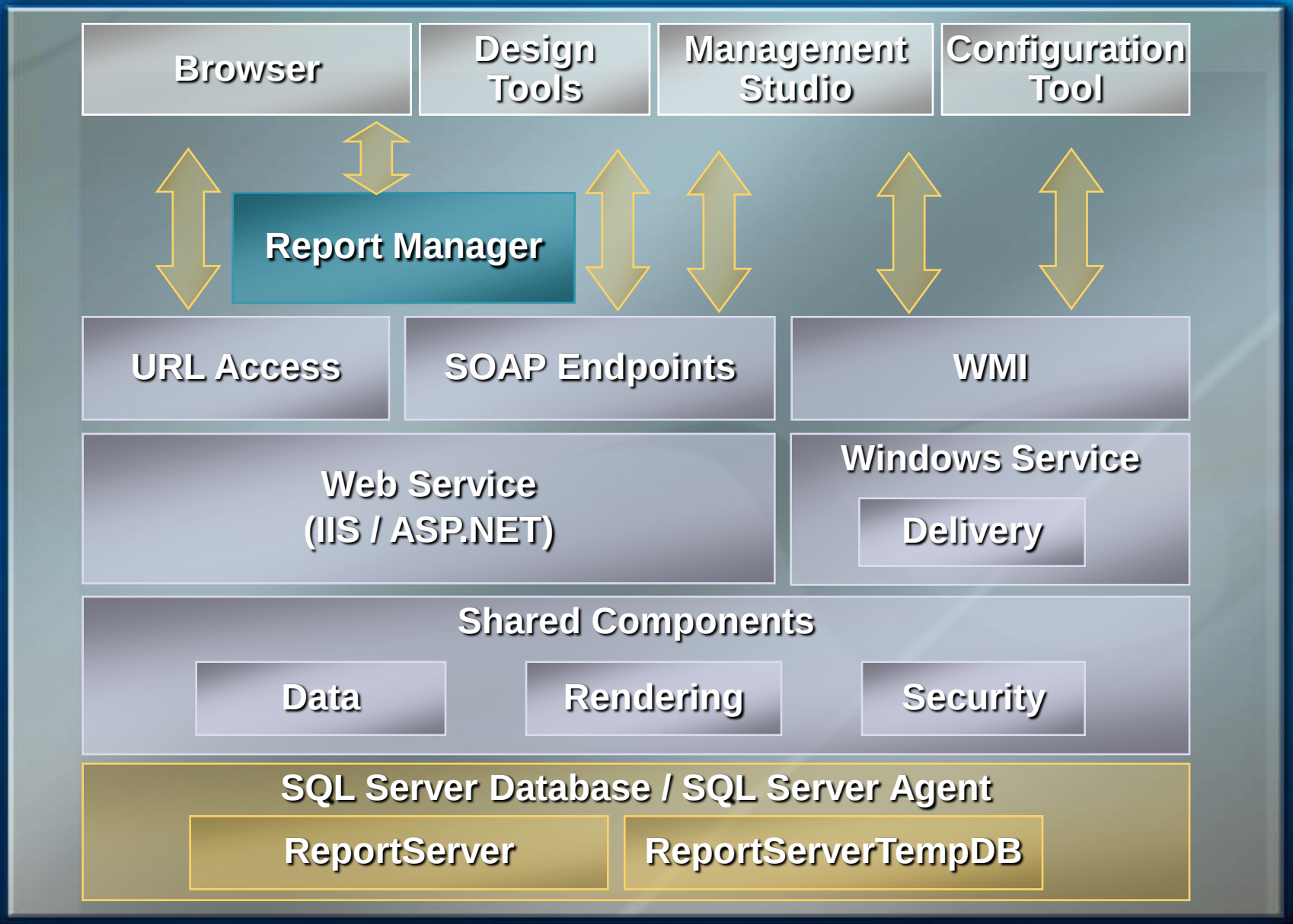
Agenda

- 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

Reporting Services Native Mode



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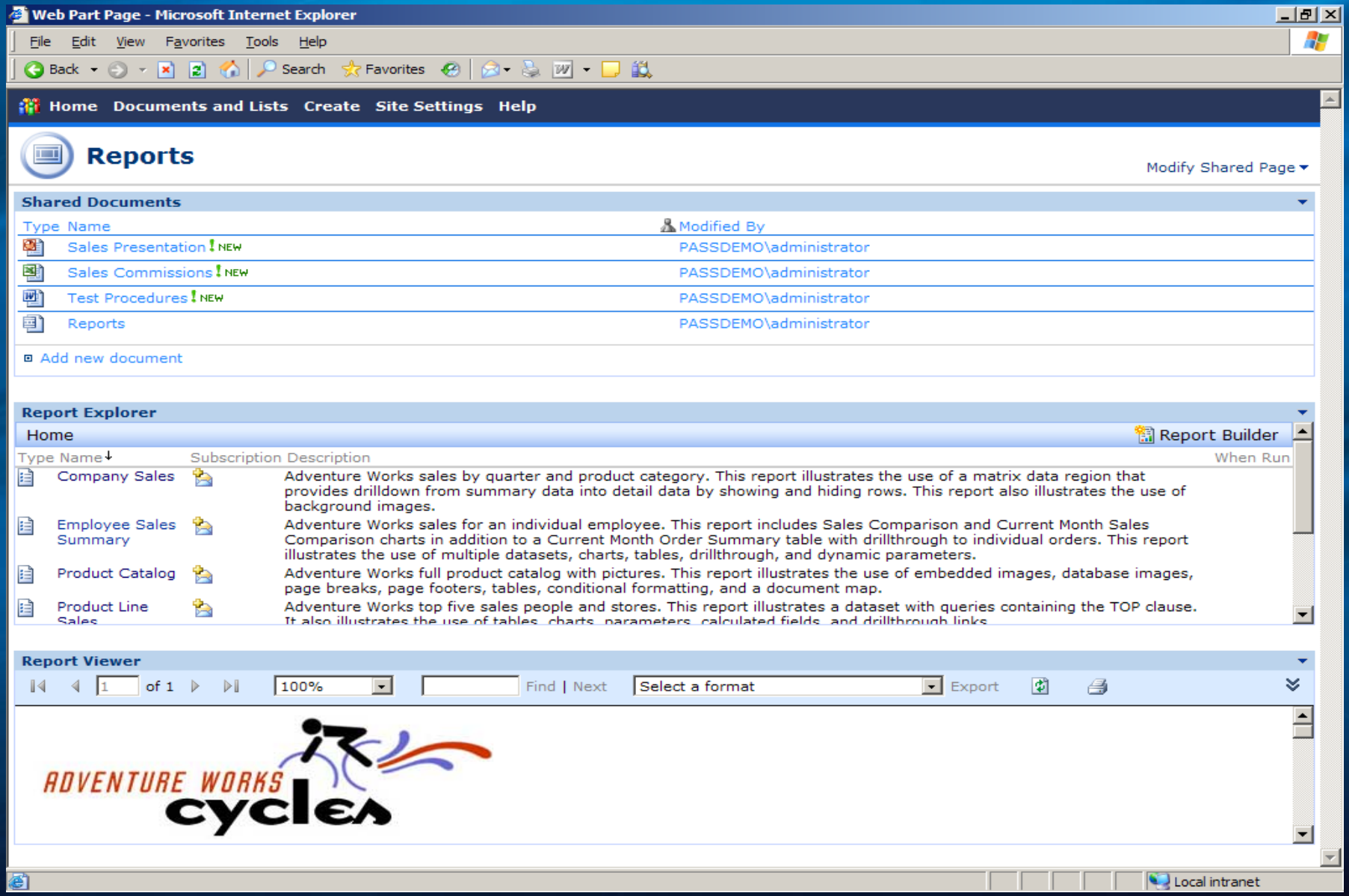
SharePoint Integration Before SP2



SharePoint Integration Before SP2

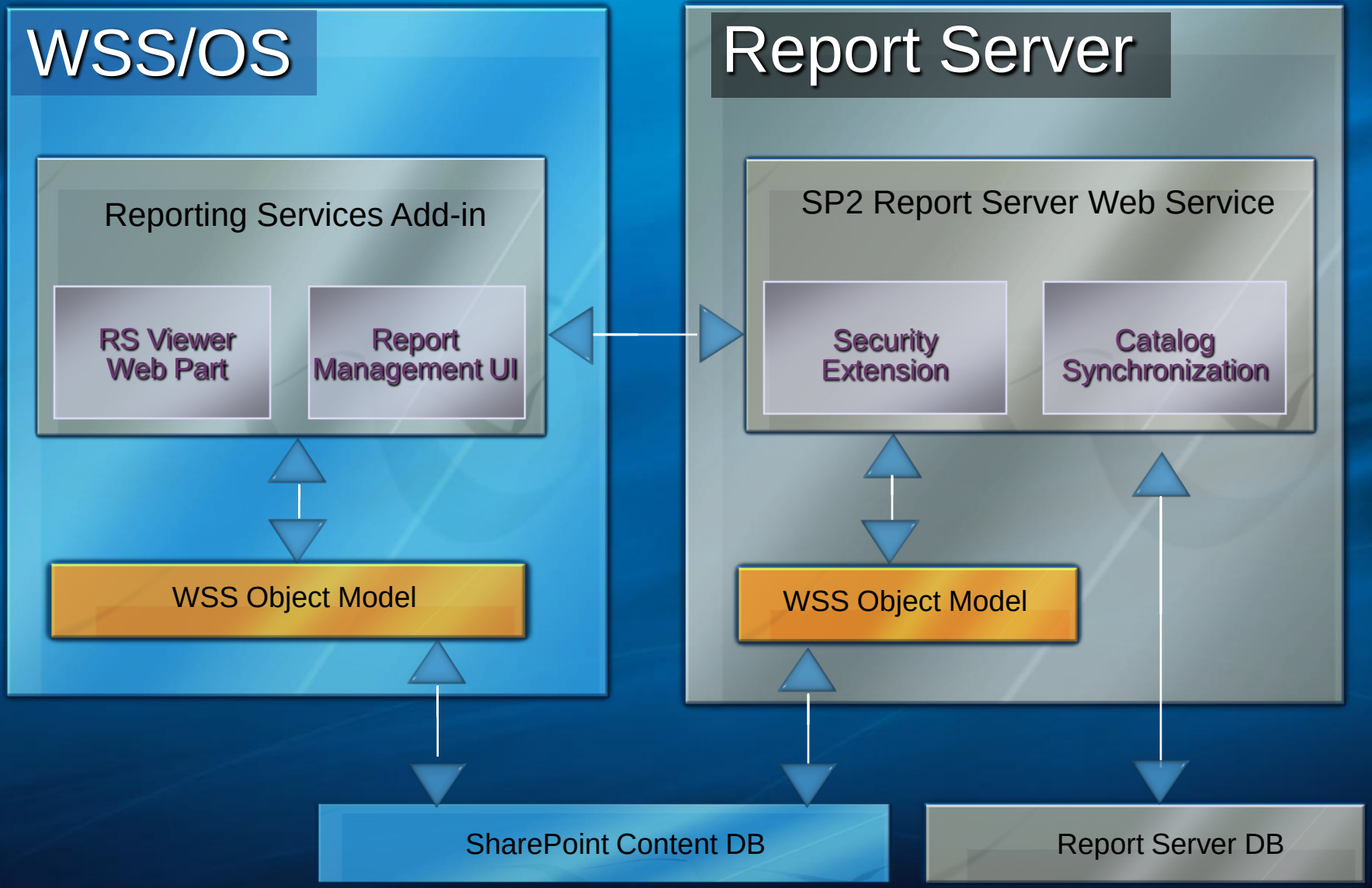
- SSRS Integration with SharePoint ‘v2’
  - Report Explorer allows users to browse and subscribe to reports
  - Report Viewer allows for users to view and navigate reports
- Limitations
  - Separate content stores
  - Different security models
  - Different management UI
  - Not deployable outside of firewall
  - No filter web parts

SharePoint Integration with SP2

- 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

SharePoint Integration Architecture

Reporting Services SharePoint Mode



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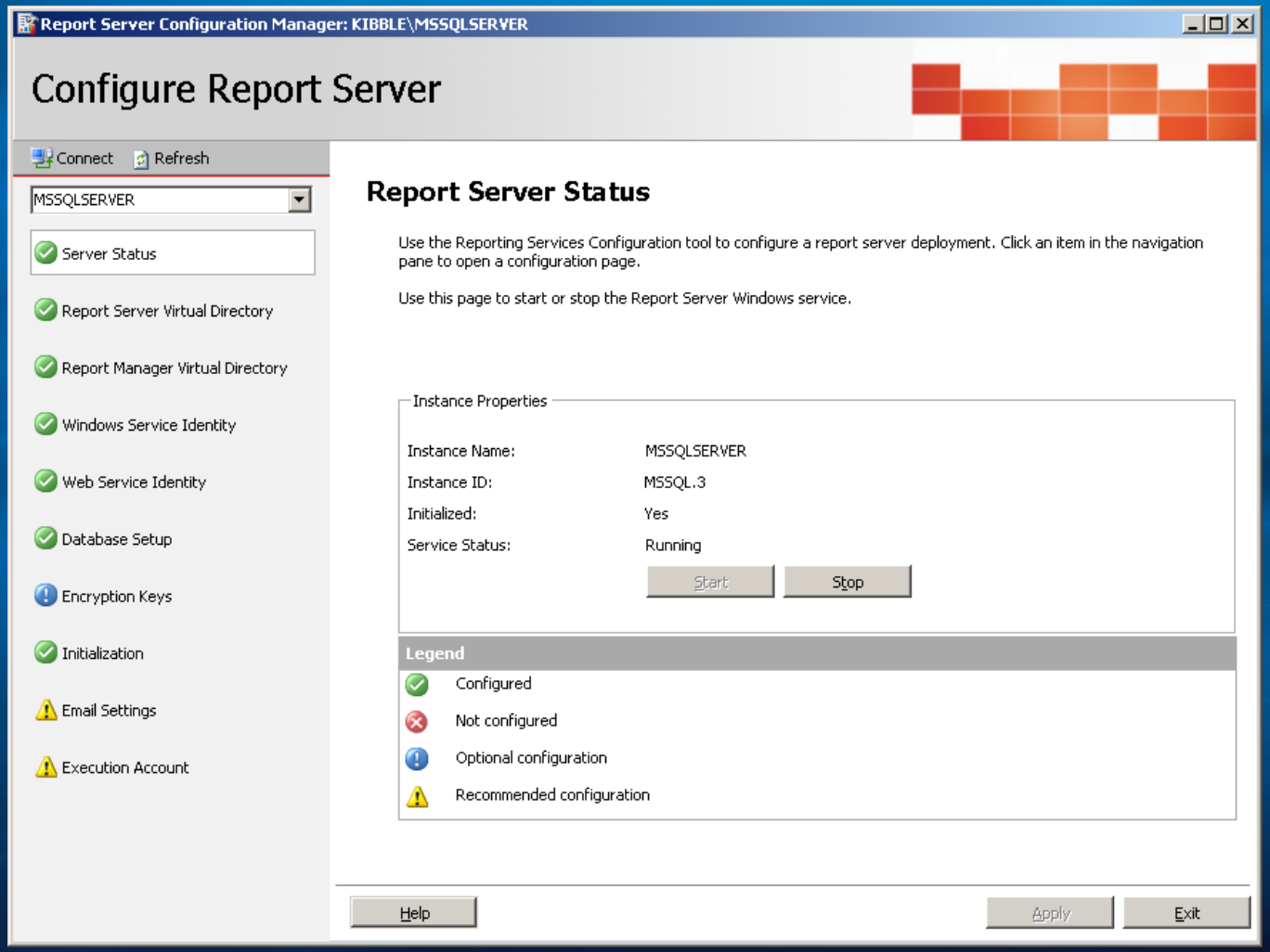
Reporting Services 2005 Setup

- 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)

Reporting Services 2005 Configuration Tool



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

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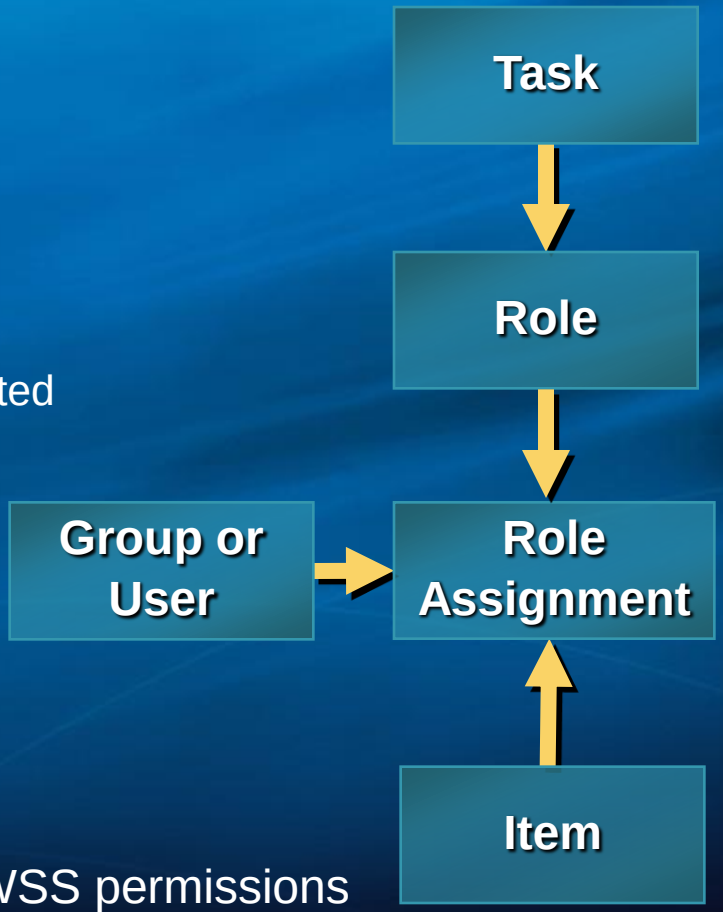
Role-Based Security Model

- 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



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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)

Report Data Sources

- 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

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Scheduling

- 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 Sever Enterprise Edition!

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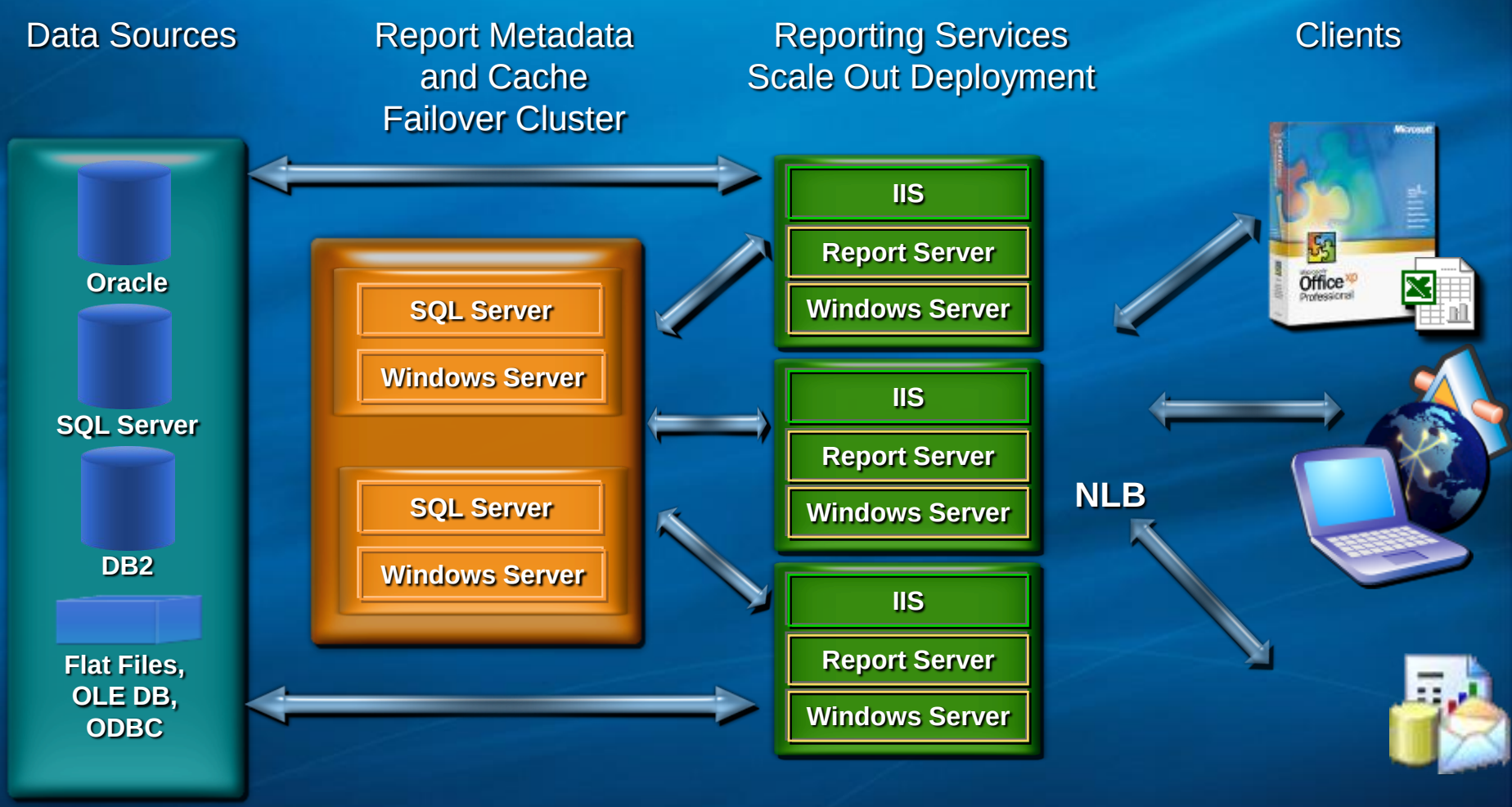
Scale Out Deployment



Scale out requires SQL Sever Enterprise Edition!

Scale Out Setup

- 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)

Wrap Up

- 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

Resources

Reporting Services Product Site
http://www.microsoft.com/sql/reporting

Technical Chats and Webcasts
http://www.microsoft.com/communities/chats/default.mspx
http://www.microsoft.com/usa/webcasts/default.asp

MSDN & TechNet
http://microsoft.com/msdn
http://microsoft.com/technet

Virtual Labs
http://www.microsoft.com/technet/traincert/virtuallab/rms.mspx

Newsgroups
http://communities2.microsoft.com/communities/newsgroups/en-us/default.aspx

Technical Community Sites
http://www.microsoft.com/communities/default.mspx

User Groups
http://www.microsoft.com/communities/usergroups/default.mspx

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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