# SQL Server Reporting Services (SSRS) – Detailed Notes

## 1. Introduction to SSRS

SSRS (SQL Server Reporting Services) is a server-based reporting platform from Microsoft that allows you to create, deploy, and manage reports. It is part of the Microsoft SQL Server suite and works closely with SQL Server databases and other data sources.

### Why SSRS?

- Centralized Reporting Platform – Manage and deliver reports from a single server.

- Rich Data Visualization – Includes tables, charts, gauges, maps, KPIs, and more.

- Multiple Data Sources – Can connect to SQL Server, Oracle, Excel, SharePoint lists, XML, OData, Azure SQL Database, etc.

- Various Delivery Methods – Email subscriptions, web portal, SharePoint integration.

- Interactive & Paginated Reports – Drill-down, drill-through, sorting, filtering, parameters.

- Secure & Role-Based Access – Control who can view or modify reports.

## 2. What We Can Perform Using SSRS

| Feature | Description | Example in Real World |

|---------|-------------|-----------------------|

| Data Retrieval | Fetch data from multiple sources using queries or stored procedures. | Retrieve monthly sales data from SQL Server. |

| Report Designing | Create tabular, matrix, chart, map, gauge, and custom reports. | Sales performance dashboard for managers. |

| Parameters | Add report filters for dynamic viewing. | Select date range for sales report. |

| Drill-Down Reports | Expand/collapse sections for details. | Region-wise sales breakdown → store-wise details. |

| Drill-Through Reports | Navigate from summary to a detailed report. | Click on a product to see customer purchase details. |

| Expressions | Use built-in functions and calculations. | Calculate Profit Margin = (Sales - Cost) / Sales. |

| Conditional Formatting | Highlight data based on rules. | Highlight products with low stock in red. |

| Charts and Graphs | Visual representation of data trends. | Monthly revenue trend chart. |

| Export Options | Export to PDF, Excel, Word, CSV, XML, PowerPoint, etc. | Download monthly sales report in PDF. |

| Subscriptions | Schedule automatic delivery via email or file share. | Email sales report to managers every Monday. |

| Security & Access Control | Assign permissions to users/groups. | Only HR can view employee salary reports. |

| Integration with Other Systems | Embed reports into web apps or SharePoint. | Customer order tracking portal with embedded SSRS reports. |

## 3. SSRS Architecture

SSRS follows a three-tier architecture:

1. Data Tier – Data sources like SQL Server, Oracle, Excel, etc.

2. Report Server – Core engine that processes and renders reports.

3. Presentation Tier – Report Manager/Web Portal where users access reports.

## 4. Development Workflow in SSRS

1. Define Requirements

2. Create Data Source

3. Create Dataset

4. Design the Report

5. Add Parameters and Filters

6. Format the Report

7. Preview & Test

8. Deploy to Report Server

9. Schedule & Subscribe

## 5. Real-World Example using AdventureWorks2014

\*\*Scenario:\*\*

The Sales Department wants a Monthly Sales Performance Report showing:

- Total Sales by Territory

- Top 5 Products by Revenue

- Monthly Sales Trend (chart)

- Filter by Year and Region

### Step 1 – Create Data Source

Connection String: `Data Source=YourServerName;Initial Catalog=AdventureWorks2014;Integrated Security=True`

### Step 2 – Create Dataset

```sql

SELECT

st.Name AS Territory,

p.Name AS Product,

SUM(sod.LineTotal) AS TotalSales,

YEAR(soh.OrderDate) AS OrderYear,

MONTH(soh.OrderDate) AS OrderMonth

FROM Sales.SalesOrderHeader soh

JOIN Sales.SalesOrderDetail sod ON soh.SalesOrderID = sod.SalesOrderID

JOIN Production.Product p ON sod.ProductID = p.ProductID

JOIN Sales.SalesTerritory st ON soh.TerritoryID = st.TerritoryID

GROUP BY st.Name, p.Name, YEAR(soh.OrderDate), MONTH(soh.OrderDate)

```

### Step 3 – Add Parameters

- @OrderYear – Dropdown from YEAR(OrderDate)

- @Territory – Dropdown from Sales.SalesTerritory

### Step 4 – Design the Report

- Table: Territory, Product, TotalSales

- Chart: Monthly sales trend

- Top N Filter: Top 5 products

### Step 5 – Conditional Formatting

```ssrs

=IIF(Fields!TotalSales.Value < 10000, "Red", "Black")

```

### Step 6 – Deploy & Test

Deploy to `http://<ReportServerName>/Reports`

## 6. Real-World Business Impact

Managers use SSRS to track monthly sales trends, filter by territory, and receive automated emails for decision-making.

## 7. Summary

- SSRS is a powerful reporting solution.

- Supports multiple data sources and interactive elements.

- AdventureWorks2014 is ideal for practice.

- Helps convert raw data into actionable insights.