Enterprise Business Intelligence Service and Report Server: Governance, Security and Administration

Duration: 2 Weeks

Week 1: BI Architecture, Administration & Governance

Day 1: Enterprise BI Architecture & Platform Overview

Module 1: Enterprise BI Landscape & Architecture

- Enterprise BI landscape: tools, layers, and integration
- BI architecture patterns: centralised, self-service, hybrid
- Report server architectures: SSRS, Power BI Report Server, Tableau Server
- BI service tiers: development, test, production environments
- BI platform selection and evaluation criteria

Lab Exercises:

1. Draw an enterprise BI architecture for a given organisational scenario with all layers
2. Compare two BI platforms across 10 capability dimensions; produce a recommendation matrix

Module 2: BI Server Installation & Configuration

- Server prerequisites: OS, database engine, memory, storage sizing
- Installing and configuring Power BI Report Server / SSRS
- Report server database setup and connection configuration
- Service accounts, configuration manager, and service startup
- SSL/TLS configuration for secure BI server communication

Lab Exercises:

3. Install and configure Power BI Report Server in a lab environment end-to-end
4. Configure SSL certificates and verify secure HTTPS access to the report portal

Day 2: Report Development & Publishing

Module 3: Report Types & Development

- Report types: paginated, interactive, mobile, embedded
- Paginated reports: data sources, datasets, parameters, layouts
- Power BI Desktop reports vs paginated reports: choosing the right type
- Report parameters: single value, multi-value, cascading
- Subreports, drillthrough, and linked reports

Lab Exercises:

5. Build a paginated sales summary report with parameters, grouping, and subtotals
6. Add drillthrough from a summary report to a transaction-level detail report

Module 4: Publishing, Versioning & Subscriptions

- Publishing reports to report server and Power BI Service
- Folder structure and report organisation standards
- Report versioning and change management
- Subscription types: email delivery, file share, SharePoint
- Data-driven subscriptions for personalised report delivery

Lab Exercises:

7. Publish a report set to the report server; organise into a governed folder structure
8. Configure data-driven email subscriptions delivering region-specific reports to 5 user groups

Day 3: Data Sources, Datasets & Connectivity

Module 5: Data Source Management

- Shared vs embedded data sources: governance implications
- Connecting to SQL Server, Azure SQL, Oracle, and flat files
- Data source credentials: stored, Windows, prompted
- Scheduled refresh: configuration, frequency, failure handling
- Gateway configuration for on-premise data sources

Lab Exercises:

9. Configure shared data sources for three environments (dev, test, prod) with credential management
10. Set up an on-premise data gateway; connect a report server to a local SQL Server database

Module 6: Dataset Design & Query Optimisation

- Shared datasets vs embedded datasets
- Dataset query design: stored procedures, views, direct SQL
- Query parameters and dynamic filtering in datasets
- Caching strategies: report execution snapshots and cached instances
- Query performance tuning for BI report datasets

Lab Exercises:

11. Create shared datasets for 3 reports; configure caching and measure query response time
12. Optimise a slow report dataset query using execution plans and indexing recommendations

Day 4: BI Governance Framework

Module 7: BI Content Governance

- BI governance: content ownership, certification, and endorsement
- Report lifecycle management: develop, review, certify, publish, retire
- Naming conventions and folder structure standards
- BI governance committee: roles, responsibilities, and cadence
- Change request and promotion process across environments

Lab Exercises:

13. Design a BI governance policy document covering ownership, certification criteria, and lifecycle stages
14. Apply naming and folder standards to reorganise a messy report server workspace

Module 8: Report Quality & Documentation Standards

- Report quality checklist: accuracy, performance, usability, accessibility
- Business requirement documentation for BI reports
- Data dictionary and field-level documentation in reports
- Report testing: unit testing, UAT, regression testing
- Version control for report definitions using source control

Lab Exercises:

15. Apply a report quality checklist to 3 existing reports; document findings and remediation steps
16. Set up source control for report definitions; commit, branch, and roll back a report version

Day 5: User Management & Access Control Foundations

Module 9: Authentication & Identity Management

- Authentication methods: Windows, forms-based, SAML, Azure AD/Entra ID
- Azure AD integration: SSO configuration for Power BI Report Server
- Multi-factor authentication for BI service access
- Service principal authentication for automated report delivery
- Troubleshooting authentication failures and token issues

Lab Exercises:

17. Configure Azure AD SSO for Power BI Report Server; test login with 3 user accounts
18. Set up service principal authentication for automated paginated report export via API

Module 10: Role-Based Access Control

- SSRS/Power BI Report Server roles: browser, content manager, publisher
- Item-level and folder-level permission assignment
- Group-based access management and Active Directory integration
- Permission inheritance and overrides
- Least-privilege principle applied to BI content

Lab Exercises:

19. Configure role assignments for 5 user groups across a 3-tier folder hierarchy
20. Verify least-privilege access: test each role can only see and do what it should

Week 2: Security, Performance & Administration

Day 6: Row-Level & Object-Level Security

Module 11: Row-Level Security (RLS)

- RLS concepts: dynamic vs static row filtering
- RLS implementation in Power BI datasets: roles and DAX filters
- RLS in SSRS: parameter-based and query-based filtering
- Testing RLS: effective user testing and view-as feature
- RLS at scale: managing many roles and complex filter logic

Lab Exercises:

21. Implement RLS for a multi-region sales report; test with 4 regional user profiles
22. Build dynamic RLS using a security table mapping users to data access scope

Module 12: Object-Level Security & Sensitive Data

- Object-level security (OLS): hiding tables and columns from roles
- Securing sensitive columns: salary, PII, financial data
- Column masking strategies in BI reports
- Securing data source credentials and connection strings
- Encryption at rest and in transit for BI data

Lab Exercises:

23. Configure OLS to hide salary and PII columns from non-HR roles; verify in report output
24. Audit a report set for PII exposure; apply masking and OLS to bring into compliance

Day 7: Audit, Compliance & Access Reviews

Module 13: Audit Logging & Usage Monitoring

- Audit logging: who accessed what report, when, and from where
- Report server execution log: schema and key fields
- Power BI activity log and audit log via Microsoft 365 admin
- Usage monitoring: view counts, query duration, failed requests

- Building a BI usage analytics dashboard from execution logs

Lab Exercises:

25. Enable and query the report server execution log; build a usage summary report
26. Create a BI usage analytics dashboard showing top reports, peak usage times, and error rates

Module 14: Access Reviews & Compliance Reporting

- Access review cycles: quarterly review of user permissions
- Identifying over-privileged users and orphaned accounts
- Compliance reporting: demonstrating access controls to auditors
- GDPR and data protection compliance for BI content
- Automated access review workflows

Lab Exercises:

27. Conduct a full access review: export all permissions, flag anomalies, and remediate 3 issues
28. Produce a compliance report demonstrating access controls and audit log coverage for an auditor

Day 8: Performance Management & Optimisation

Module 15: Report Performance Analysis

- Report performance bottlenecks: dataset, query, rendering, network
- Performance Analyser in Power BI Desktop: DAX queries, visuals, other
- DAX Studio for query profiling and optimisation
- Vertipaq Analyser: model size, column cardinality, relationships
- SSRS report execution log for performance trending

Lab Exercises:

29. Profile a slow Power BI report using Performance Analyser and DAX Studio; fix 3 bottlenecks
30. Use Vertipaq Analyser to reduce a bloated data model size by at least 30%

Module 16: Caching, Refresh & Scalability

- Import vs DirectQuery vs Dual mode: performance trade-offs
- Incremental refresh: configuration, partitions, and date ranges
- Report server caching: snapshot schedules and cache expiry
- Report server capacity planning: CPU, memory, concurrent users
- Horizontal scaling: report server scale-out deployment

Lab Exercises:

31. Configure incremental refresh for a large fact table; measure load time before and after
32. Simulate 20 concurrent users on a report server; analyse resource usage and identify limits

Day 9: Disaster Recovery, Backup & High Availability

Module 17: Backup & Restore

- Report server database backup: ReportServer and ReportServerTempDB
- Encryption key backup and restore procedures
- Report definition backup: RDL files and content export
- Restore procedures: database, encryption keys, configuration
- Backup scheduling and retention policy

Lab Exercises:

33. Perform a full report server backup; simulate failure; restore to a clean environment
34. Test encryption key restore after simulated key loss; verify report server recovers correctly

Module 18: High Availability & Disaster Recovery Planning

- High availability architecture: load balancer, shared database
- Scale-out deployment: multiple report server nodes
- Failover configuration and health checks
- RTO and RPO definition for BI services
- DR testing: planned failover walkthrough and validation

Lab Exercises:

35. Configure a 2-node report server scale-out; test failover by stopping one node
36. Write and execute a DR test plan for the BI service; document RTO achieved vs target

Day 10: Administration, Patch Management & Capstone

Module 19: Ongoing Administration & Operations

- Patch management: version upgrades and hotfix procedures
- Server health monitoring: CPU, memory, disk, service status
- Scheduled maintenance: index rebuild, log cleanup, temp DB purge
- Troubleshooting common report server issues: connectivity, rendering, auth
- Operational runbook: daily, weekly, and monthly admin tasks

Lab Exercises:

37. Build an operational runbook covering daily health checks, weekly maintenance, and monthly reviews
38. Troubleshoot and resolve 3 simulated report server incidents using logs and diagnostics

Module 20: Capstone Project

- End-to-end BI server administration scenario
- Environment setup: install, configure, secure, and connect data sources
- Report publishing, access control, and RLS implementation
- Performance optimisation and monitoring dashboard
- Governance documentation and operational runbook presentation

Lab Exercises:

39. Complete a full BI server administration setup: install, configure, secure, publish reports, and apply RLS
40. Architecture decisions, security posture, governance policy, and operational procedures