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DP-500: Designing and Implementing Enterprise-Scale Analytics Solutions Using Microsoft Azure and Microsoft Power BI (4 Days)

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This course covers methods and practices for performing advanced data analytics at scale. Students will build on existing analytics experience and will learn to implement and manage a data analytics environment, query and transform data, implement and manage data models, and explore and visualize data. In this course, students will use Microsoft Purview, Azure Synapse Analytics, and Power BI to build analytics solutions.

Audience Profile

Candidates for this course should have subject matter expertise in designing, creating, and deploying enterprise-scale data analytics solutions. Specifically, candidates should have advanced Power BI skills, including managing data repositories and data processing in the cloud and on-premises, along with using Power Query and Data Analysis Expressions (DAX). They should also be proficient in consuming data from Azure Synapse Analytics and should have experience querying relational databases, analyzing data by using Transact-SQL (T-SQL), and visualizing data.

Prerequisites

- You should be familiar with basic data concepts and terminology.

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Modulo 1: Explore Azure data services for modern analytics

Understand analytics solutions in the Azure data ecosystem. Explore the architecture of a scalable analytics solution to meet business needs.

Learning objectives

After completing this module, you will be able to:

- Describe the Azure data ecosystem for analytics

Modulo 2: Understand concepts of data analytics

Explore key concepts of data analytics, including types of analytics, data, and storage. Explore the analytics process and tools used to discover insights.

Learning objectives

After completing this module, you will be able to:

- Describe types of data analytics
- Understand the data analytics process

Modulo 3: Explore data analytics at scale

Describe data analytics at scale and understand the roles of a data team. Learn about the responsibilities of an enterprise data analyst and what tools are available to build scalable solutions.

Learning objectives

After completing this module, you will be able to:

- Explore data job roles in analytics
- Understand tools for scaling analytics solutions

Modulo 4: Introduction to Microsoft Purview

In this module, you'll evaluate whether Microsoft Purview is the right choice for your data discovery and governance needs.

Learning objectives

By the end of this module, you'll be able to:

- Evaluate whether Microsoft Purview is appropriate for your data discovery and governance needs.
- Describe how the features of Microsoft Purview work to provide data discovery and governance.

Modulo 5: Discover trusted data using Microsoft Purview

Use Microsoft Purview Studio to discover trusted organizational assets for reporting.

Learning objectives

After completing this module, you'll be able to:

- Browse, search, and manage data catalog assets.
- Use data catalog assets with Power BI.
- Use Microsoft Purview in Azure Synapse Studio.

Modulo 6: Catalog data artifacts by using Microsoft Purview

Register, scan, catalog, and view data assets and their relevant details in Microsoft Purview.

Learning objectives

By the end of this module, you'll be able to:

- Describe asset classification in Microsoft Purview.

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Modulo 7 : Manage Power BI assets by using Microsoft Purview

Improve data governance and asset discovery using Power BI and Microsoft Purview integration.

Learning objectives

By the end of this module, you'll be able to:

- Register and scan a Power BI tenant.
- Use the search and browse functions to find data assets.
- Describe the schema details and data lineage tracing of Power BI data assets.

Modulo 8: Integrate Microsoft Purview and Azure Synapse Analytics

Learn how to integrate Microsoft Purview with Azure Synapse Analytics to improve data discoverability and lineage tracking.

Learning objectives

After completing this module, you'll be able to:

- Catalog Azure Synapse Analytics database assets in Microsoft Purview.
- Configure Microsoft Purview integration in Azure Synapse Analytics.
- Search the Microsoft Purview catalog from Synapse Studio.
- Track data lineage in Azure Synapse Analytics pipelines activities.

Modulo 9 : Introduction to Azure Synapse Analytics

Learn about the features and capabilities of Azure Synapse Analytics - a cloud-based platform for big data processing and analysis.

Learning objectives

In this module, you'll learn how to:

- Identify the business problems that Azure Synapse Analytics addresses.
- Describe core capabilities of Azure Synapse Analytics.
- Determine when to use Azure Synapse Analytics.

Modulo 10: Use Azure Synapse serverless SQL pool to query files in a data lake

With Azure Synapse serverless SQL pool, you can leverage your SQL skills to explore and analyze data in files, without the need to load the data into a relational database.

Learning objectives

After the completion of this module, you will be able to:

- Identify capabilities and use cases for serverless SQL pools in Azure Synapse Analytics
- Query CSV, JSON, and Parquet files using a serverless SQL pool
- Create external database objects in a serverless SQL pool

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Modulo 11 : Analyze data with Apache Spark in Azure Synapse Analytics

Apache Spark is a core technology for large-scale data analytics. Learn how to use Spark in Azure Synapse Analytics to analyze and visualize data in a data lake.

Learning objectives

After completing this module, you will be able to:

- Identify core features and capabilities of Apache Spark.
- Configure a Spark pool in Azure Synapse Analytics.
- Run code to load, analyze, and visualize data in a Spark notebook.

Modulo 12: Analyze data in a relational data warehouse

Relational data warehouses are a core element of most enterprise Business Intelligence (BI) solutions, and are used as the basis for data models, reports, and analysis.

Learning objectives

In this module, you'll learn how to:

- Design a schema for a relational data warehouse.
- Create fact, dimension, and staging tables.
- Use SQL to load data into data warehouse tables.
- Use SQL to query relational data warehouse tables.

Modulo 13 : Choose a Power BI model framework

Describe model frameworks, their benefits and limitations, and features to help optimize your Power BI data models.

Learning objectives

By the end of this module, you'll be able to:

- Describe Power BI model fundamentals.
- Determine when to develop an import model.
- Determine when to develop a DirectQuery model.
- Determine when to develop a composite model.
- Choose an appropriate Power BI model framework.

Modulo 14: Understand scalability in Power BI

Scalable data models enable enterprise-scale analytics in Power BI. Implement data modeling best practices, use large dataset storage format, and practice building a star schema to design analytics solutions that can scale.

Learning objectives

By the end of this module, you'll be able to:

- Describe the importance of building scalable data models
- Implement Power BI data modeling best practices
- Use the Power BI large dataset storage format

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Modulo 15 : Create and manage scalable Power BI dataflows

Create Power BI transformation logic for reuse across your organization with Power BI dataflows. Learn how to combine Power BI dataflows with Power BI Premium for scalable ETL, and practice creating and consuming dataflows.

Learning objectives

By the end of this module, you'll be able to:

- Describe Power BI dataflows and use cases.
- Describe best practices for implementing Power BI dataflows.
- Create and consume Power BI dataflows.

Modulo 16: Create Power BI model relationships

Power BI model relationships form the basis of a tabular model. Define Power BI model relationships, set up relationships, recognize DAX relationship functions, and describe relationship evaluation.

Learning objectives

By the end of this module, you'll be able to:

- Understand how model relationship work.
- Set up relationships.
- Use DAX relationship functions.
- Understand relationship evaluation.

Modulo 17 : Use DAX time intelligence functions in Power BI Desktop models

By the end of this module, you'll learn the meaning of time intelligence and how to add time intelligence DAX calculations to your model.

Learning objectives

By the end of this module, you'll be able to:

- Define time intelligence.
- Use common DAX time intelligence functions.
- Create useful intelligence calculations.

Modulo 18: Create calculation groups

In this module you'll learn what calculation groups are, explore key features and usage scenarios, and learn to create calculation groups.

Learning objectives

After completing this module, you will be able to:

- Explore how calculation groups work.
- Maintain calculation groups in a model.
- Use calculation groups in a Power BI report.

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Modulo 19 : Enforce Power BI model security

Enforce model security in Power BI using row-level security and object-level security.

Learning objectives

By the end of this module, you'll be able to:

- Restrict access to Power BI model data with RLS.
- Restrict access to Power BI model objects with OLS.
- Apply good development practices to enforce Power BI model security.

Modulo 20: Use tools to optimize Power BI performance

Use tools to develop, manage, and optimize Power BI data model and DAX query performance.

Learning objectives

After completing this module, you'll be able to:

- Optimize queries using performance analyzer.
- Troubleshoot DAX performance using DAX Studio.
- Optimize a data model using Tabular Editor.

Modulo 21 : Understand advanced data visualization concepts

Create cohesive, inclusive, and efficient Power BI reports to effectively communicate results.

Learning objectives

In this module, you'll learn how to:

- Create and import a custom report theme.
- Create custom visuals with R or Python.
- Enable personalized visuals in a report.
- Review report performance using Performance Analyzer.
- Design and configure Power BI reports for accessibility.

Modulo 22: Monitor data in real-time with Power BI

Describe real-time analytics in Power BI using automatic page refresh, real-time dashboards, and auto-refresh in paginated reports.
Learning objectives

By the end of this module, you'll be able to:

- Describe Power BI real-time analytics.
- Set up automatic page refresh.
- Create real-time dashboards.
- Set up auto-refresh paginated reports.

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Modulo 23 : Create paginated reports

Paginated reports allow report developers to create Power BI artifacts that have tightly controlled rendering requirements. Paginated reports are ideal for creating sales invoices, receipts, purchase orders, and tabular data. This module will teach you how to create reports, add parameters, and work with tables and charts in paginated reports.

Learning objectives

In this module, you will:

- Get data.
- Create a paginated report.
- Work with charts and tables on the report.
- Publish the report.

Modulo 24: Provide governance in a Power BI environment

Power BI governance is a set of rules, regulations, and policies that define and ensure the effective, controlled, and valuable operation of a BI environment. In this module, you'll learn the fundamental components and practices necessary to govern a Power BI tenant.

Learning objectives

In this module, you will:

- Define the key components of an effective BI governance model
- Describe the key elements associated with data governance
- Configure, deploy, and manage elements of a BI governance strategy
- Set up BI help and support settings

Modulo 25 : Monitor and audit usage

Usage metrics help you understand the impact of your dashboards and reports. When you run either dashboard usage metrics or report usage metrics, you discover how those dashboards and reports are being used throughout your organization, who's using them, and for what purpose. Knowing who is taking what action on which item in your Power BI tenant can be critical in helping your organization fulfill its requirements, like meeting regulatory compliance and records management. This module outlines what is available in usage metrics reports and audit logs.

Learning objectives

In this module, you will:

- Discover what usage metrics are available through the Power BI admin portal
- Optimize use of usage metrics for dashboards and reports
- Distinguish between audit logs and the activity logs

Modulo 26: Broaden the reach of Power BI

You can broaden the reach of Power BI by sharing your reports beyond your Power BI environment. You can publish reports to the public internet, embed reports in Microsoft Teams or in PowerApps, and place BI reports in a SharePoint online web part. There's also a special version of Power BI service called Microsoft Power BI Embedded (PBIE) which allows application developers to embed fully interactive reports into their applications without having to build their own data visualizations and controls from scratch.

Learning objectives

By the end of this module, you'll be able to:

- Describe the various embedding scenarios that allow you to broaden the reach of Power BI
- Understand the options for developers to customize Power BI solutions
- Learn to provision and optimize Power BI embedded capacity and create and deploy dataflows
- Build custom Power BI solutions template apps

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Modulo 27 : Build reports using Power BI within Azure Synapse Analytics

In this module, you will learn how you can build Power BI reports from within Azure Synapse Analytics.

Learning objectives

In this module, you'll:

- Describe the Power BI and Synapse workspace integration
- Understand Power BI data sources
- Describe optimization options
- Visualize data with serverless SQL pools

Modulo 28: Design a Power BI application lifecycle management strategy

The use of OneDrive, Git repositories, and Power BI deployment pipelines allows us to follow application lifecycle management techniques. This reduces administrative overhead and provides continuity in the development process.

Learning objectives

Upon completion of this module, you should be able to:

- Outline the application lifecycle process.
- Choose a source control strategy.
- Design a deployment strategy.

Modulo 29 : Create and manage a Power BI deployment pipeline

Deployment pipelines enable creators to develop and test Power BI content in the Power BI service before the content is made available for consumption by users. It offers creators improved productivity, faster delivery of content updates, and reduced manual work and errors. The tool is designed as a pipeline with three stages: development, test, and production.

Learning objectives

By the end of this module, you'll be able to:

- Articulate the benefits of deployment pipelines
- Create a deployment pipeline using Premium workspaces
- Assign and deploy content to pipeline stages
- Describe the purpose of deployment rules
- Deploy content from one pipeline stage to another

Modulo 30: Create and manage Power BI assets

Creating shared data assets for your analytics environment provides structure and consistency. Maintaining those assets is as important, and XMLA endpoint provides additional administrative capabilities.

Learning objectives

Upon completion of this module, you should be able to:

- Create specialized datasets.
- Create live and DirectQuery connections.
- Use Power BI service lineage view.
- Use XMLA endpoint to connect datasets.

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