Azure Overlaps 202X

Data Fundamentals (DP-900)

Database Admin (DP-300)

Power BI Data Analyst (PL-300)

AZURE HAS ONLY BASE PRODUCT SERVICES THAT ARE USED TOGETHER AS A CLOUD APPLICATION

- DATABASES - STORAGE - VNETS - HUBS - APP SERVERS – VIRTUAL MACHINES – AD/MS ENTRA ID

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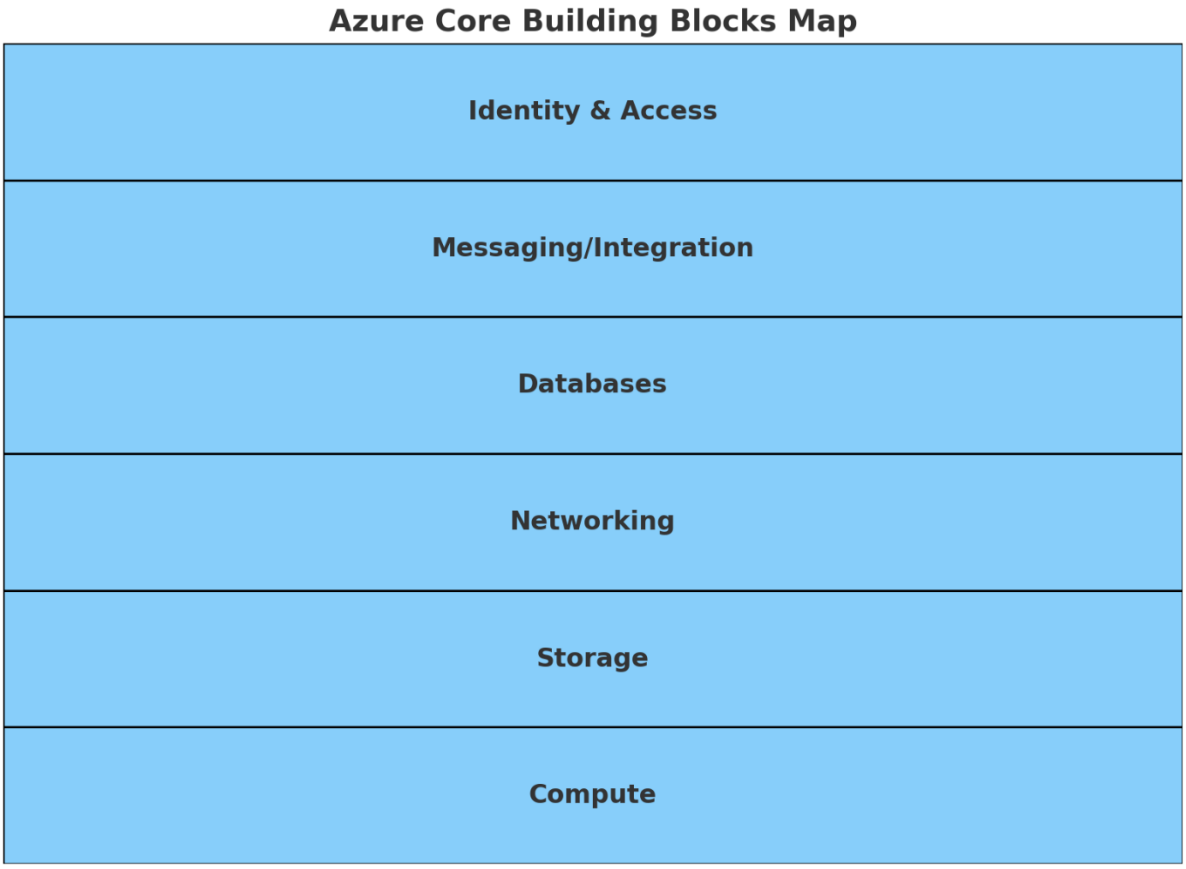
Azure Base Primitives

Many of Azure's 200+ named services are really *packaged combinations* built on a handful of the true "raw ingredients".

Base Services/Resources

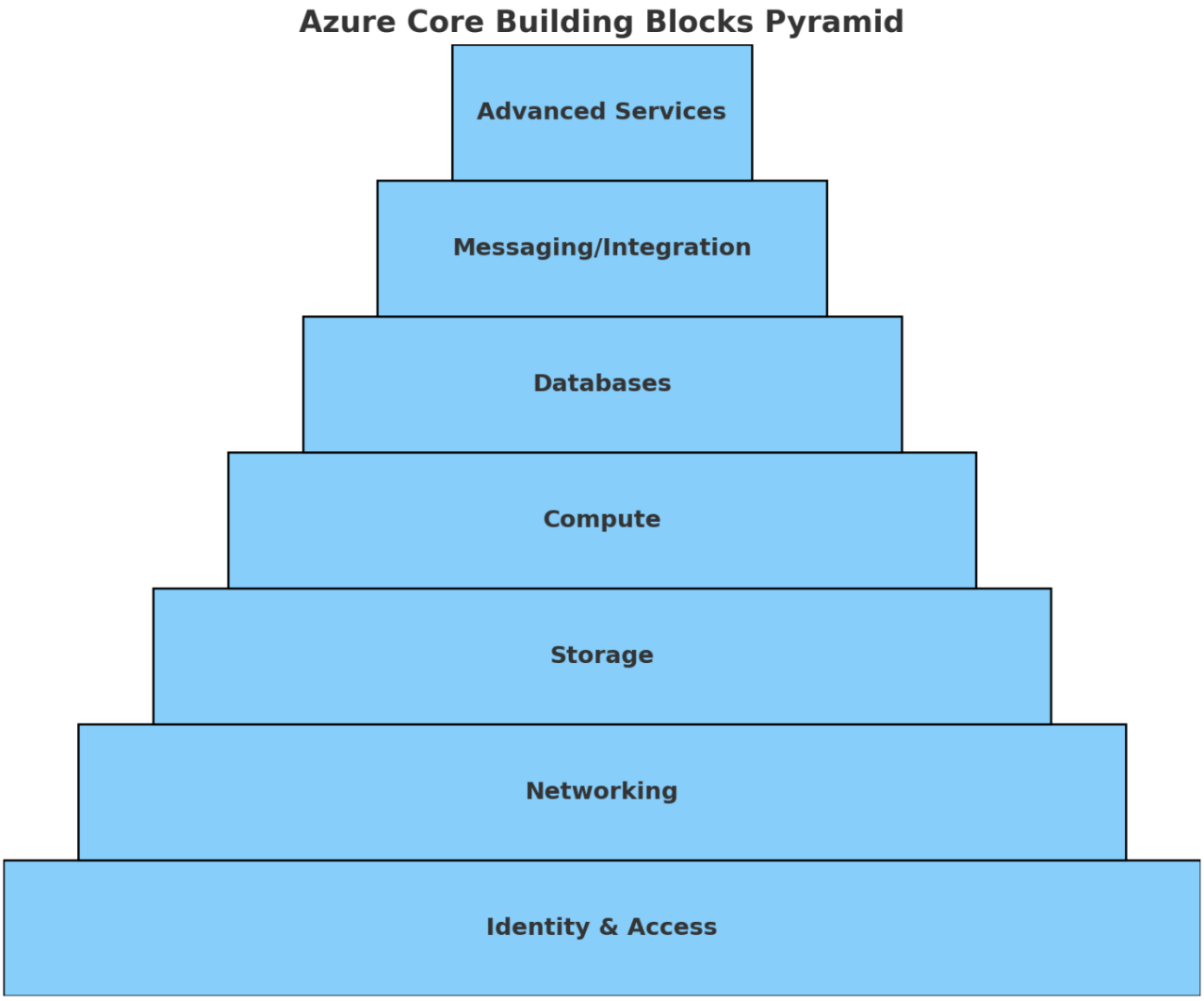
- Compute (VMs, App Services, Containers)
- Storage (Blobs, Files, Tables, Queues)
- Networking (VNets, Load Balancers, Gateways, Firewalls)
- Databases (SQL, NoSQL, Relational/Non-Relational engines)
- Messaging/Integration Hubs (Service Bus, Event Hub, IoT Hub)
- Identity & Access (Entra ID / AAD) ← often overlooked but always present

"Azure Core Building Blocks Map" (visual diagram)



Stacked Pyramid Diagram

How Azure's base primitives (Identity, Networking, Storage, Compute, Databases, Messaging) support the higher-level Advanced Services (AI, Analytics, DevOps, Security, IoT, etc.).



Main Azure Services by Exam

DP-900 (Azure Data Fundamentals)

- **Core Data Concepts**
  - Structured vs Unstructured data
  - Relational vs Non-Relational
- **Azure Data Services**
  - **Azure SQL Database (PaaS)**
  - **What it is:** A fully managed **relational database** service (SQL Server in the cloud).
  - **Why use it:** Best for apps needing structured, transactional data with minimal admin overhead.
  - ---
  - **Azure Cosmos DB (NoSQL)**
  - **What it is:** A **globally distributed NoSQL database** supporting multiple data models (key-value, document, graph, column).
  - **Why use it:** Ideal for apps needing **massive scale and low-latency access** across regions.
  - ---
  - **Azure Data Lake Storage**
  - **What it is:** A cloud-based **data lake** optimized for storing huge volumes of raw structured + unstructured data.
  - **Why use it:** Acts as the **central storage hub** for big data analytics pipelines.
  - ---
  - **Azure Synapse Analytics (DW)**
  - **What it is:** A **cloud data warehouse** for querying and analyzing large datasets with SQL.
  - **Why use it:** Great for **business intelligence and reporting** on enterprise-scale data.
  - ---
  - **Azure Data Factory (ETL/Integration)**
  - **What it is:** A **data integration service** to build ETL/ELT pipelines (Extract, Transform, Load).
  - **Why use it:** Moves and transforms data between sources (on-prem, cloud, apps) to keep systems connected.
  - ---

- **Azure Databricks (Intro only)**
- **What it is:** A **big data + AI analytics platform** built on Apache Spark, integrated with Azure.
- **Why use it:** Used for **data science, machine learning, and large-scale data processing**.
- ---
- 👉 Do you want me to also map these into a **"who typically uses it" (DBA, Data Engineer, Data Scientist, BI Analyst)** view for clarity?
-

- **General Admin / Security**
  - Role-Based Access Control (RBAC) basics
  - Data compliance basics

DP-300 (Administering Relational Databases on Azure)

- **SQL Server / Azure SQL Services**
  - Azure SQL Database (single / elastic pool)
  - Azure SQL Managed Instance
  - SQL Server on Azure VMs (IaaS)
- **Administration Topics**
  - Backup/Restore, HA/DR
  - Performance Tuning
  - Monitoring (Azure Monitor, Log Analytics)
- **Security**
  - Authentication (Azure AD Integration)
  - User Roles / Permissions
  - Auditing, Threat Detection
- **Networking**
  - VNets, Private Link, Firewalls
- **Automation**
  - ARM Templates, PowerShell, CLI

PL-300 (Power BI Data Analyst)

- **Power BI Service**
  - Datasets, Reports, Dashboards
  - Workspaces, Sharing, Collaboration
- **Power BI Desktop**
  - Data Modeling (DAX, Relationships)
  - Transformations (Power Query)
  - Visualization best practices
- **Data Sources**
  - Azure SQL Database, Synapse, Excel, SharePoint
  - DirectQuery vs Import vs Live Connection

- **Governance**
    - Security Roles (Row-level Security)
    - Workspace Permissions

Topic Overlap

Topic / Service	DP-900	DP-300	PL-300
Azure SQL Database	✅	✅	✅ (as data source)
Storage (Blob/Data Lake)	✅	(less)	✅ (as source)
Networking (VNets, Firewalls)	(light)	✅	(rare)
RBAC / Azure AD	✅ (basics)	✅ (deep)	✅ (workspace access)
ETL / Data Integration	✅ (Data Factory basics)	(ops)	✅ (Power Query)
Visualization / Reporting	✅ (light)	(none)	✅ (core)

So the "big bridges" are **Azure SQL, Security (Azure AD / RBAC), and Storage**.

Training Flow (2 weeks each)

Weeks 1–2: Foundation (DP-900)

Focus: **Concepts + Intro Services**

- Week 1:
  - Core data concepts (structured, relational, non-relational)
  - Relational DBs → Azure SQL basics
  - Storage: Blob, Data Lake
- Week 2:
  - Analytics services: Synapse, Data Factory, Power BI basics
  - Intro to security (RBAC, compliance)
  - Connect SQL → Power BI for simple dashboards

👉 Sets the **common ground** (SQL, Storage, Security, Data Sources).

Weeks 3–4: Admin (DP-300)

Focus: **Deep Dive on SQL in Azure**

- Week 3:
  - Deployment models (SQL DB, MI, VM)
  - Networking, VNets, Private Endpoints
  - Backup, HA/DR, Monitoring
- Week 4:
  - Security (logins, roles, auditing, encryption)
  - Performance tuning, Query Store, indexing
  - Automation (CLI, PowerShell)

👉 Highlights **SQL Admin specialization** (goes deeper than DP-900).

Weeks 5–6: Analyst (PL-300)

Focus: **Data Analysis & Visualization**

- Week 5:
    - Power BI Desktop (import, model, transform data)
    - DAX fundamentals, relationships
    - DirectQuery vs Import from Azure SQL
- Week 6:
    - Reports, Dashboards, Sharing
    - Security (RLS, workspace permissions)
    - Governance + Collaboration

👉 Builds on **SQL as a source + security concepts**, but emphasizes **user-facing analytics**.

Training Logic Recap

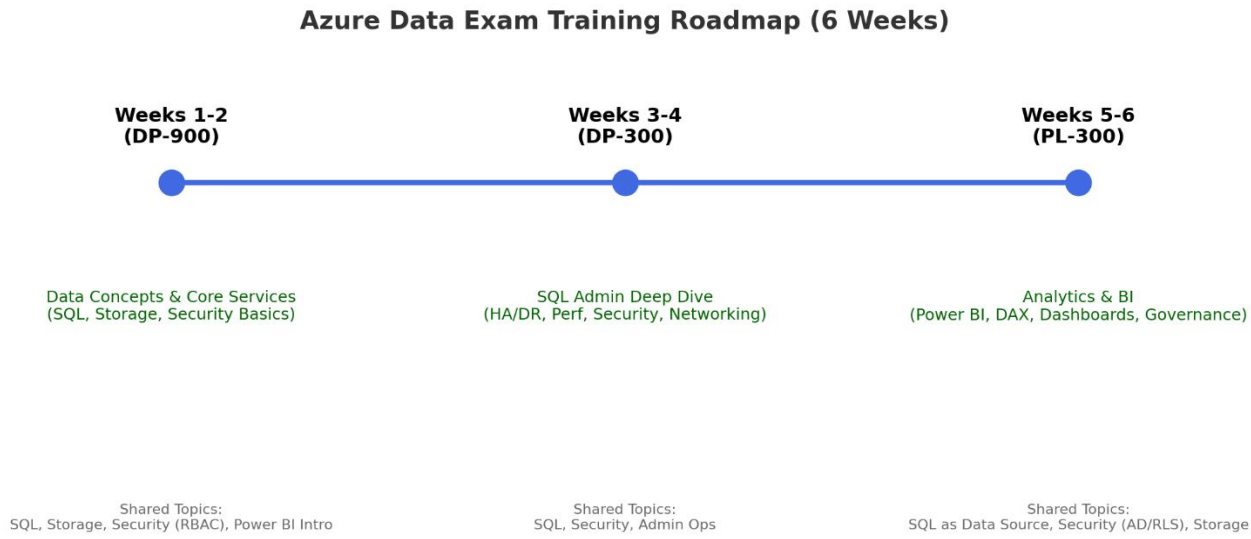
- **Start DP-900** → base concepts, intro services.
- **Next DP-300** → dive into **SQL admin** (uses same services but at ops/security layer).
- **Finish PL-300** → consume those same data sources in Power BI for business use.

This way:

- Learners see **SQL** in all 3 exams.
- Security/RBAC repeated in increasing depth.
- Storage appears early, reused in BI.
- Only **outlier** is Machine Learning / AI (DP-900 touches lightly, but not on others).

👉 Visual roadmap

6-week training builds exam by exam, common ground and outliers marked.



Azure Billing Models & Services List

🔷 SQL Databases

- **DTU (Database Transaction Unit) model**
  - Abstract blend of CPU, memory, and I/O.
  - Simpler, but less transparent.
  - Good for predictable small workloads.
- **vCore (Virtual Core) model**
  - Pay for compute (cores), memory, storage separately.
  - More flexible + aligns with on-prem SQL licensing.
  - Scaling is clearer and easier.

🔷 Storage

- **Blob / Data Lake**
  - Billed per **GB stored per month**
  - Additional cost for **read/write transactions** and **data egress**.

🔷 Synapse Analytics

- **Provisioned (Dedicated SQL Pools)** → vCore/hour billing.
- **Serverless SQL** → per TB of data processed.

🔷 Data Factory

- Pay per **activity run** + **data movement** + **integration runtime hours**.

🔷 Power BI

- **Free** → personal use only.
- **Pro (per user/month)** → sharing & collaboration.
- **Premium (per capacity or per user)** → larger datasets, advanced features.

🔷 Compute (App Services / VM)

- Pay per **CPU/memory/hour** (VM size or App Service plan).

Azure Billing Models by Service Mapped

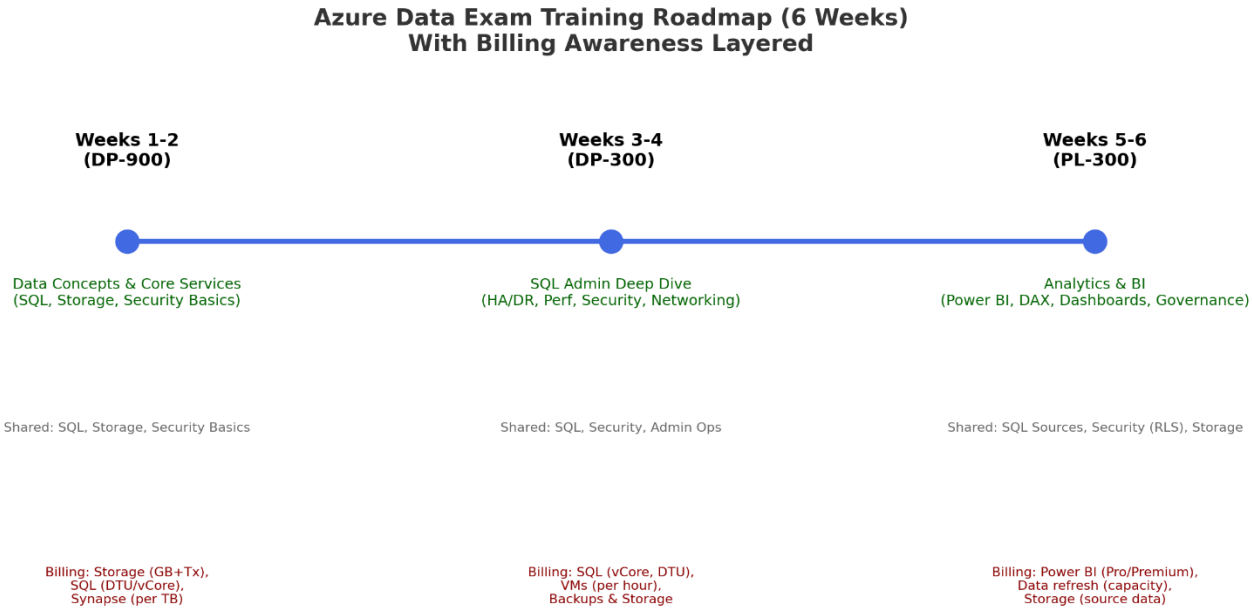
Mapped to the main services across your three exams (DP-900, DP-300, PL-300):

Service	Billing Model	Applied To
Azure SQL Database	- **DTU (Database Transaction Unit)**: bundled compute, memory, I/O.- **vCore**: pay per core, memory, storage, backup separately.	Single DBs, Elastic Pools.
Azure SQL Managed Instance	- **vCore-based** only.	Enterprise workloads needing SQL Server compatibility.
SQL Server on Azure VM	- Pay per **VM size (cores/memory/hour)**.- Storage billed separately.	Lift-and-shift SQL workloads.
Azure Synapse Analytics	- **Provisioned (Dedicated SQL Pool)**: vCore/hour.- **Serverless SQL Pool**: pay per TB of data processed.	Data warehousing & analytics.
Azure Storage / Data Lake	- Pay per **GB/month**.- Additional for **transactions** (read/write) and **egress**.	Blob, Table, Queue, Data Lake Gen2.
Azure Data Factory	- Pay per **activity run**.- **Data movement** charges.- **Integration runtime hours** if self-hosted.	ETL pipelines.
Power BI	- **Free** (personal only).- **Pro**: per user/month.- **Premium**: per capacity/month or per user.	Reports, dashboards, sharing.
Azure App Services / VMs	- Pay per **App Service Plan (tier)** or **VM size/hour**.- Scaling adds cost.	Hosting web apps, APIs, admin tools.

👉 Quick takeaway:

- **SQL workloads** → mostly DTU or vCore.
- **Analytics (Synapse)** → vCore/hour vs pay-per-TB.
- **Storage** → pay for capacity + transactions.
- **Integration (Data Factory)** → usage-based.
- **Visualization (Power BI)** → subscription licensing.

Where billing matters most per exam



Here's the **6-week roadmap with billing awareness layered in**:

- **DP-900 (Weeks 1–2):** Learners see billing basics — SQL (DTU/vCore), Storage (GB+transactions), Synapse serverless (per TB).
- **DP-300 (Weeks 3–4):** Emphasis shifts to SQL vCore/DTU in depth, VM per-hour billing, storage/backups.
- **PL-300 (Weeks 5–6):** Billing focus is on Power BI (Pro/Premium licensing), capacity refresh costs, plus storage tied to data sources.

Cost Awareness Cheat Sheet by Exam

Exam	Main Services Used	Billing Model(s)	Cost Awareness Notes
DP-900 (Azure Data Fundamentals)	- Azure SQL Database- Azure Storage / Data Lake- Synapse Analytics (intro)- Data Factory (light)- Power BI (intro)	- SQL: DTU or vCore- Storage: GB/month + transactions- Synapse: per TB (serverless)- Data Factory: per activity run- Power BI Free	- Show how SQL billing differs (DTU vs vCore).- Storage grows with data size + access frequency.- Synapse serverless cost sneaks up with ad-hoc queries.- Data Factory billed on pipeline runs.
DP-300 (Database Admin)	- Azure SQL Database (single / pool)- Managed Instance- SQL Server on Azure VM- Storage (backups, logs)- Azure Monitor / Automation	- SQL: DTU or vCore- Managed Instance: vCore- SQL VM: VM size/hour + storage- Backup storage billed separately	- Scaling cores drives compute cost significantly.- Elastic pools cost less than many single DBs.- HA/DR replicas double compute/storage costs.- VM billing = compute uptime (stop VM to save).
PL-300 (Power BI Data Analyst)	- Power BI Desktop & Service- Azure SQL DB (as source)- Synapse / Storage (as source)- Dataflows / Refreshes	- Power BI Free, Pro (per user), Premium (per capacity or per user)- Storage: GB/month- Data refresh: capacity bound	- Most cost is **license-based** (Pro vs Premium).- Larger datasets need Premium capacity.- Refresh frequency impacts compute load.- External data sources (SQL/Synapse) still incur their costs.

🔑 **Quick Cost Awareness Themes**

- **SQL Everywhere** → Cost drivers are DTU vs vCore vs VM.
- **Storage Everywhere** → Always pay for **GB/month + transactions**.
- **Analytics** → Synapse (per TB queries) + Power BI licensing.
- **Admin** → Backups, HA/DR, and uptime (VMs) multiply costs.

Security & Access Steps Azure AD, Microsoft Entra, RBAC

Role-Based Access Control Security**,** ETL/Data Integration**,** Analytics, and Visualization.

Diagram

```
Security & Access Control
  ├─ Add AD Admin to SQL Server
  ├─ Assign RBAC Role
  ├─ Create Policy
  └─ Use Microsoft Entra ID

ETL / Data Integration
  ├─ Create Pipeline
  ├─ Add Source Dataset
  ├─ Add Transformation
  ├─ Add Sink Dataset
  └─ Trigger Pipeline

Analytics Services
  ├─ Connect Data Source
  ├─ Ingest Data
  ├─ Query Data
  ├─ Secure Data
  └─ Monitor Usage

Visualization / Reporting
  ├─ Connect to Data Source
  ├─ Model Data
  ├─ Create Visuals
  ├─ Publish Report
  └─ Share & Secure
```

Security & Access Control (Azure AD / Entra / RBAC)

Admin Actions (Least Verbose Steps):

1. **Add Azure AD Admin to SQL Server**:
   - Go to SQL Server in Azure Portal → *Active Directory Admin* → Select user/group → Save.
2. **Assign RBAC Role to User**:
   - Azure Portal → *Access Control (IAM)* → Add Role Assignment → Choose Role (e.g., Reader, Contributor) → Select user/group → Assign.
3. **Create Policy for Resource Access**:

- Azure Policy → Definitions → Assign policy to scope (e.g., subscription/resource group) → Configure parameters → Assign.

4. **Use Microsoft Entra ID (formerly Azure AD)**:
   - Central identity management → Assign users to apps → Configure SSO → Monitor sign-ins.

ETL / Data Integration (Azure Data Factory)

Basic ETL Steps:

1. **Create Pipeline**:
   - Data Factory → Author → New Pipeline.
2. **Add Source Dataset**:
   - Define source (e.g., Azure Blob, SQL DB).
3. **Add Transformation (Optional)**:
   - Use Data Flow or Mapping Data Flow for transformations.
4. **Add Sink Dataset**:
   - Define destination (e.g., Azure SQL, Data Lake).
5. **Trigger Pipeline**:
   - Manual, scheduled, or event-based trigger.

Analytics Services (Synapse / SQL / Storage)

Common Ground Setup:

1. **Connect Data Source**:
   - Synapse Studio → Manage → Linked Services → Add connection (SQL, Blob, etc.).
2. **Ingest Data**:
   - Use Copy Data tool or pipelines.
3. **Query Data**:
   - Use SQL scripts or Spark notebooks.
4. **Secure Data**:
   - Use RBAC, firewall rules, and encryption.
5. **Monitor Usage**:

- Synapse Studio → Monitor → Pipelines, SQL requests, etc.

☑ Visualization / Reporting (Power BI / Synapse)

Light Reporting Steps:

1. **Connect to Data Source**:
   - Power BI Desktop → Get Data → Choose source.
2. **Model Data**:
   - Define relationships, calculated columns/measures.
3. **Create Visuals**:
   - Drag fields to canvas → Choose chart type.
4. **Publish Report**:
   - Power BI Desktop → Publish to Power BI Service.
5. **Share & Secure**:
   - Use workspaces, roles, and row-level security.

Reference

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5. Course PL-300T00-A: Design and manage analytics solutions using Power BI - Training | Microsoft Learn
6. MicrosoftLearning/PL-300-Microsoft-Power-BI-Data-Analyst