Lesson 19

Topic: Publishing and Sharing in Power BI
Prerequisites: Give a written brief explanation for all questions.

1. What is the difference between Power BI Desktop and Power BI Online Service?

1. Purpose & Usage

Power BI Desktop:

A **free Windows application** for creating and designing reports.

Used for **data modeling, transformation (Power Query), DAX calculations, and report development**.

Works **offline** (requires publishing to share reports).

Power BI Service (Online):

A **cloud-based platform** for **sharing, collaborating, and viewing reports**.

Requires a **Power BI Pro or Premium license** for full functionality.

Enables **dashboard creation, scheduled refreshes, and sharing with others**.

2. Data Connectivity & Refresh

Desktop:

Connects to **wide variety of data sources** (Excel, SQL, APIs, etc.).

Manual refresh or scheduled via **Power BI Gateway**.

Service:

Can **refresh datasets automatically** (if gateway is configured).

Limited to **cloud-based data sources** unless using an on-premises gateway.

3. Collaboration & Sharing

Desktop

Reports must be **published to Power BI Service** to share.

No built-in collaboration features.

Service:

Share dashboards/reports with colleagues.

Workspaces for team collaboration.

Publish to web (publicly or internally).

4. Features & Capabilities

Feature	Power BI Desktop	Power BI Service
Report Creation	✓ Yes	✗ No (view/edit only)
Data Modeling (DAX/PQ)	✓ Yes	✗ Limited
Dashboards	✗ No	✓ Yes
Scheduled Refresh	✗ No	✓ Yes
Alerts & Subscriptions	✗ No	✓ Yes
AI & Quick Insights	✗ No	✓ Yes
Mobile App Access	✗ No	✓ Yes

5. Licensing & Cost

Power BI Desktop: **Free** (no license required)

Power BI Service:

Free tier (limited sharing).

Pro license ($10/user/month) for full sharing.

Premium capacity for large-scale deployments.

When to Use Which?

Use **Power BI Desktop** for **building and designing reports**.

Use **Power BI Service** for **sharing, dashboards, and collaboration**.

2. How do you publish a Power BI report from Desktop to the Online Service?

Step-by-Step: Publish from Power BI Desktop to Power BI Service
Prerequisites
✓ You must be signed in to Power BI Desktop with your Power BI account (work/school email).
✓ You need a Power BI Pro or Premium license (if sharing with others).
✓ Ensure your data sources support gateway refresh (if using on-premises data).

Steps to Publish
Open Your Report in Power BI Desktop

Ensure your report is ready (data loaded, visuals created, no errors).

Sign in to Power BI Service

Go to File → Sign in (if not already signed in).

Use your organizational (work/school) account.

Click "Publish"

Go to the Home tab → Click "Publish" (or File → Publish → Publish to Power BI).

https://docs.microsoft.com/en-us/power-bi/consumer/media/end-user-upload/power-bi-publish.png

Select a Destination Workspace

Choose a workspace (e.g., "My Workspace" or a shared workspace).

Click "Select".

Wait for Publishing to Complete

A status bar appears showing upload progress.

Once done, you'll see a success message with a link to the report in Power BI Service.

https://docs.microsoft.com/en-us/power-bi/consumer/media/end-user-upload/power-bi-upload-success.png

Open the Report in Power BI Service

Click "Open 'your report name'.pbix in Power BI" to view it online.

Post-Publishing Steps
1. Set Up Scheduled Data Refresh (If Needed)
If your data is from an on-premises source (SQL Server, Excel, etc.), set up a Power BI Gateway.

Go to the dataset settings → Schedule Refresh.

2. Share the Report (If Needed)
In Power BI Service, click Share (requires Pro license for sharing with others).

Or publish to App for broader distribution.

3. Create Dashboards (Optional)
Pin visuals from the report to a dashboard for a consolidated view.

Troubleshooting Common Issues
✖ "Publishing failed" → Check internet connection or sign-in status.
✖ Gateway not configured → Set up a gateway for on-premises data sources.
✖ License error → Ensure you have a Pro license if sharing with others.

Key Notes
The published report will retain all visuals, filters, and interactions.
Data refresh must be configured separately in the Power BI Service.
If you update the report in Desktop, you must republish to see changes online.

3. What is a workspace in Power BI? What are the types of workspaces available?
   A workspace in Power BI is a collaborative environment where teams can create, share, and manage dashboards, reports, datasets, and dataflows. Think of it like a shared folder where multiple users can collaborate on Power BI content.

Workspaces are essential for:
✅ Team collaboration (multiple users working on the same reports).
✅ Content organization (grouping related reports/dashboards).
✅ Deployment pipelines (development → test → production).

✅ App publishing (bundling reports for end-users).

Types of Workspaces in Power BI

There are **two main types** of workspaces, based on the underlying infrastructure:

1. Standard Workspaces (Shared Capacity)

Hosted on Microsoft's shared cloud servers.

Suitable for small teams or individual use.

Limitations:

Performance depends on shared resources.

Limited to **Pro licensing** (each user needs a Pro license to access).

2. Premium Workspaces (Dedicated Capacity)

Runs on dedicated cloud resources (Power BI Premium or PPU).

Benefits:

No per-user licensing (viewers don't need Pro licenses).

Higher performance & larger datasets (up to 100TB).

Supports **paginated reports, AI, and advanced dataflows**.

Two subtypes:

Premium Per User (PPU) – For individual users needing Premium features.

Premium Capacity (EM/P SKUs) – For organizations with large-scale deployments.

Workspace Roles & Access Levels

Workspaces have **four roles** to control permissions:

Role	Permissions
Admin	Full control (add users, delete workspace, publish apps).
Member	Edit content, publish reports, but can't manage users.
Contributor	Edit reports but can't publish apps or share broadly.
Viewer	Read-only access (view dashboards/reports).

4.What is the difference between a workspace and an app in Power BI?

Difference Between a Workspace and an App in Power BI

Feature	Workspace	App
Purpose	A **collaboration space** for creating, editing, and managing reports, dashboards, and datasets.	A **published collection** of dashboards and reports for end-users to consume.
Audience	**Developers & Report Creators** (Power BI designers, data analysts).	**Business Users & Stakeholders** (managers, executives, teams).
Access Control	Role-based (Admin, Member, Contributor, Viewer).	View-only (users can interact but not edit).
Licensing	- **Standard Workspace**: Requires Pro/Premium Per User (PPU) for contributors. - **Premium Workspace**: Free for viewers if on Premium capacity.	- Free for viewers if published from a **Premium workspace.** - Requires Pro/PPU if from a **Standard workspace.**
Content Management	Raw datasets, works-in-progress, multiple versions.	Curated, finalized reports ready for consumption.

Feature	Workspace	App
Publishing	No "publishing" needed—just save and collaborate.	Must be `published manually` from a workspace.
Updates	Changes happen in real-time (no versioning).	Requires `republishing` to update the app.
Navigation	Can be cluttered (all works-in-progress).	Clean, organized, and user-friendly.

Key Differences Explained

1. Workspace = Development Environment

Used by **Power BI developers** to build and test reports.

Contains **datasets, reports, dashboards, and dataflows**.

Supports **version control** (if using deployment pipelines).

2. App = Distribution Channel

A **packaged, read-only version** of reports/dashboards.

Users **cannot edit** the app content.

Acts like a **"published product"** for business users.

When to Use Which?

Scenario	Use a Workspace	Use an App
Building & editing reports	✅ Yes	✖ No
Sharing with other developers	✅ Yes	✖ No
Distributing finalized reports to business users	✖ No	✅ Yes

Scenario	Use a Workspace	Use an App
Allowing stakeholders to view KPIs	✘ No	✓ Yes
Managing datasets & dataflows	✓ Yes	✘ No

Example Workflow

Developers work in a **workspace** to create reports.

Once finalized, they **publish an app** for end-users.

Business users access the **app** (no editing allowed).

Key Takeaways

Workspace = **Creation & Collaboration** (for Power BI designers).

App = **Consumption & Distribution** (for business users).

Apps are **static snapshots** of workspace content until republished.

5.Explain the different Power BI license types and their limitations.
Power BI License Types & Limitations (2024 Update)

Power BI offers several licensing options, each with different features, costs, and restrictions.

Here's a breakdown:

1. Power BI Free

Who it's for: Individual users exploring Power BI.

Cost: Free

Key Features:

✓ Create and publish reports in **"My Workspace."**

✓ Connect to 70+ data sources (Excel, SQL, SharePoint, etc.).

✓ Use Power BI Desktop (full authoring capabilities).

Limitations:

✗ **Cannot share reports** (except via PBIX files or PDF export).

✗ No access to **workspaces** (collaboration).

✗ No **scheduled data refreshes** (manual only).

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2. Power BI Pro

Who it's for: Business analysts, report creators, and small teams.

Cost: $10/user/month

Key Features:

✓ Everything in **Free**, plus:

✓ **Share reports/dashboards** with other Pro users.

✓ **Collaborate in workspaces**.

✓ **Publish to web** (public or internal).

✓ **Scheduled refresh** (up to 8 times/day).

✓ **Apps** (distribute reports to teams).

Limitations:

✗ **Cannot share with non-Pro users** (all viewers need a Pro license).

✗ **No paginated reports** (requires Premium).

✗ **Limited AI & advanced analytics**.

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3. Power BI Premium Per User (PPU)

Who it's for: Users needing Premium features without enterprise capacity.

Cost: $20/user/month

Key Features:

✓ Everything in **Pro**, plus:

✓ **Paginated reports** (pixel-perfect, PDF-style).

✅ **AI capabilities** (AutoML, Cognitive Services).

✅ **Larger datasets** (up to 100GB vs. Pro's 1GB).

✅ **Advanced dataflows** (computed entities).

✅ **XMLA endpoint access** (for advanced modeling).

Limitations:

❌ **Still requires per-user licensing** (not cost-effective for large orgs).

❌ **Cannot share with Free users** (unlike Premium Capacity).

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4. Power BI Premium (Capacity-Based)

Who it's for: Enterprises needing large-scale deployment.

Cost: $4,995/month (P1 SKU) or higher (EM/SKU tiers).

Key Features:

✅ **No per-user licensing for viewers** (Free users can access).

✅ **Greater scalability** (up to 400TB datasets).

✅ **Paginated reports, AI, advanced analytics**.

✅ **Multi-geo deployment** (data residency control).

✅ **Automatic query caching** (faster performance).

Limitations:

❌ **Expensive** (only cost-effective for large orgs).

❌ **Requires dedicated cloud resources**.

Comparison Table

Feature	Free	Pro ($10)	PPU ($20)	Premium ($4,995+)
Report Creation	✅	✅	✅	✅
Share with Pro Users	❌	✅	✅	✅
Share with Free Users	❌	❌	❌	✅
Scheduled Refresh	❌	✅ (8x/day)	✅ (48x/day)	✅ (48x/day)

Feature	Free	Pro ($10)	PPU ($20)	Premium ($4,995+)
Paginated Reports	✗	✗	✓	✓
AI & AutoML	✗	✗	✓	✓
Large Datasets	✗ (1GB)	✗ (1GB)	✓ (100GB)	✓ (400TB)
XMLA Endpoint	✗	✗	✓	✓

Which License Should You Choose?

Individuals/Small Teams → **Pro** ($10/user).

Advanced Users (AI, Big Data) → **PPU** ($20/user).

Enterprise (1000+ Users) → **Premium Capacity** ($4,995+/month).

Key Takeaways

Free = Personal use only (no sharing).

Pro = Best for small teams (collaboration).

PPU = Premium features for individuals.

Premium = Enterprise-grade (best for large orgs).

6.How can you share a report with someone who doesn't have a Pro license?
How to Share a Power BI Report with Non-Pro (Free) Users

Since **Power BI Pro** licenses are required for sharing in most cases, you'll need one of

these **workarounds** to share with free users:

Option 1: Use Power BI Premium Capacity (Best for Enterprises)

✓ **Workspace is on Premium (P1/P2/P3/EM/SKU)**

✓ **Viewers don't need a Pro license**

Steps:

Publish the report to a Premium workspace.

Share directly via:

"Share" button (if allowed by admin).

Publish an App (free users can access if the workspace is Premium).

Option 2: Publish to Web (Publicly Accessible) (Caution: Data Exposure Risk!)

✅ **Free, but report becomes public** (anyone with the link can view).

✖ **Not secure** (avoid for sensitive data).

Steps:

Open the report in **Power BI Service**.

Go to **File → Embed report → Publish to web**.

Copy the **public link** or embed code.

> **Warning:** This makes your data **searchable on Google**. Disable if accidentally enabled!

Option 3: Export to PDF/PPT/Excel (Static Copies)

✅ **No license needed** (manual sharing via email/Teams).

✖ **No interactivity** (filters, slicers won't work).

Steps:

Open the report in **Power BI Service** or **Desktop**.

Click **File → Export → PDF/PPT/Excel**.

Share the file via email/cloud storage.

Option 4: Use Power BI Embedded (For Apps/Websites) (Developer Option)

✅ **Embed in a website/portal** (users access without login).

❌ **Requires Azure setup & additional costs**.

Steps:

Purchase **Power BI Embedded (A SKU)** in Azure.

Use the **Power BI REST API** to embed reports.

Option 5: Print or Screenshare (Quick & Dirty Fix)

✅ **No setup needed**.

❌ **Not scalable, no interactivity**.

Print the report as a PDF.

Share screen in Teams/Zoom meetings.

Comparison Table

Method	Works for Free Users?	Secure?	Interactive?	Best For
Premium Workspace	✅ Yes	✅ Yes	✅ Yes	Enterprises
Publish to Web	✅ Yes	❌ No	✅ Yes	Public dashboards
Export to PDF/PPT	✅ Yes	✅ Yes	❌ No	Static reports
Power BI Embedded	✅ Yes	✅ Yes	✅ Yes	Web apps
Print/Screenshare	✅ Yes	✅ Maybe	❌ No	Ad-hoc sharing

Best Practice:

For enterprises: Use **Premium Capacity** (lets free users view reports securely).

For public data: Use **Publish to Web** (but be cautious).

For one-off sharing: Export to PDF/PPT.

7.What is a semantic model (dataset) in Power BI, and where is it stored in the service?
What is a Semantic Model (Dataset) in Power BI?

A **semantic model** (formerly called a dataset in Power BI) is a structured data layer that defines:

Tables, relationships, and calculations (DAX measures, calculated columns).

Business logic (KPIs, hierarchies, metadata).

Security rules (Row-Level Security - RLS)

It acts as the **"brains"** of your reports, enabling consistent analytics across dashboards and reports.

Where is the Semantic Model Stored in Power BI Service?

The semantic model is stored in:

Power BI Service (Cloud)

When you **publish a Power BI Desktop (.pbix) file**, its dataset is uploaded to the service. Located under:

Workspace → Datasets tab (for management).

DataHub (centralized dataset catalog in Premium).

External Sources (Live/DirectQuery)

If using **DirectQuery/Live Connection**, the semantic model stays in:

Azure Analysis Services

SQL Server Analysis Services (SSAS)

Dataverse, Snowflake, etc.

Key Features of a Semantic Model

Feature	Description
Data Modeling	Defines tables, relationships, and schema.
DAX Measures	Calculations like Total Sales = SUM(Sales[Amount]).
Row-Level Security (RLS)	Filters data by user roles (e.g., "Only show sales for the user's region").
Query Caching	Improves performance by storing query results.
Incremental Refresh	Updates only new data (for large datasets).

How to Access & Manage Semantic Models?

In **Power BI Service**:

Go to a **workspace** → **Datasets tab**.

Click on a dataset to:

Schedule refresh (for imported data).

Set up RLS (security).

View downstream dependencies (reports using it).

Semantic Model vs. Dataflow vs. Dataset

Term	Definition
Semantic Model	The logical layer (tables, relationships, DAX).
Dataset (Legacy Term)	Same as semantic model (still used in some UIs).
Dataflow	Reusable ETL layer (Power Query transformations).

Example Workflow

Power BI Desktop: Create a semantic model (import data + DAX).

Publish to Service: Dataset appears in workspace.

Build Reports: Multiple reports can use the same semantic model.

Key Takeaways

A semantic model is the **foundation** for all reports/dashboards

Stored in **Power BI Service** (or external sources for DirectQuery).

Managed via **workspace datasets** (refresh, security, performance).

8. How does Scheduled Refresh work in Power BI Online Service?

Scheduled Refresh automatically updates your **imported datasets** in Power BI Service at defined intervals, ensuring reports show the latest data without manual intervention.

How It Works

1. Prerequisites

✓ **Gateway Setup (For On-Premises Data)**

Install & configure the **On-premises Data Gateway** if your data source is **SQL Server, Excel, SharePoint, etc.**
Assign **gateway admins/data source permissions**.

✓ **Cloud Data Sources (No Gateway Needed)**

Direct connections (Azure SQL, SharePoint Online, Snowflake, etc.) work without a gateway.

✓ **Power BI Pro/Premium License**

Pro: **8 refreshes/day** max.

Premium/PPU: **48 refreshes/day** max.

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2. Configuring Scheduled Refresh

Steps:

Publish your dataset from Power BI Desktop to the Power BI Service.

Go to the **workspace → Datasets + dataflows** tab.

Select your dataset → Click **Settings (gear icon)**.

Under **Scheduled refresh**, toggle it **"On"**.

Set:

Frequency (Daily, Hourly, etc.).

Time Zone.

Specific Times (e.g., 12 AM, 6 AM).

Enter credentials for data sources (if not already stored).

Save the settings.

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3. What Happens During Refresh?

Power BI Service **re-runs Power Query (M) transformations**.

Reimports data from the original source.

Recalculates DAX measures.

Updates all connected reports/dashboards.

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4. Types of Refresh

Type	Description
Full Refresh	Replaces all data in the dataset.

Type	Description
Incremental Refresh	Only loads new/changed data (requires **date filtering** in Power Query).
DirectQuery/Live Connection	No refresh needed (always live).

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5. Monitoring Refresh Status

Go to **Workspace → Datasets → Refresh history**.

Check for:

✅ **Success** (Last refresh time).

✖ **Failures** (Error details, e.g., expired credentials).

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6. Common Issues & Fixes

Issue	Solution
Gateway Offline	Restart gateway service.
Invalid Credentials	Re-enter credentials in **Data Source Settings**.
Query Timeout	Optimize Power Query or increase timeout in **Gateway Settings**.
Too Many Rows	Use **Incremental Refresh** or filter data in Power Query.

Key Takeaways

Scheduled Refresh **keeps reports up-to-date automatically**

Requires a **gateway for on-premises data**.

Pro (8x/day), Premium/PPU (48x/day) limits apply.

Incremental Refresh saves time for large datasets.

9.What is the difference between a dataset and a dataflow in Power BI?
Dataset vs. Dataflow in Power BI: Key Differences

Both **datasets** (semantic models) and **dataflows** help organize data in Power BI, but they serve

different purposes. Here's a breakdown:

Feature	Dataset (Semantic Model)	Dataflow
Purpose	Defines the **analytical model** (tables, relationships, DAX measures).	Performs **data preparation** (ETL) for reuse across datasets.
Created In	Power BI Desktop or Power BI Service.	Power BI Service (or Power Query Online).
Primary Use	Used to build **reports & dashboards**.	Used to **clean, transform, and centralize data** before it enters a dataset.
Storage	Stored in **Power BI Service** (or linked to external sources like SSAS).	Stored in **Azure Data Lake Storage (ADLS)** (if enabled) or Power BI capacity.
Refresh	Scheduled refresh updates imported data.	Refreshes **independently** of datasets.
Reusability	Typically used by **one report** (unless shared).	Can be reused by **multiple datasets/reports**.
Components	- Tables - Relationships - DAX measures - RLS rules	- Power Query (M) transformations - Computed entities (advanced ETL)
Example	A sales dataset with Revenue, Products, and Customers tables.	A dataflow that cleans and merges raw sales data from SQL + Excel.

When to Use Which?

Use a Dataset (Semantic Model) When:

You need to build **interactive reports/dashboards**.

You require **DAX measures, hierarchies, or RLS**.

Your data is ready for analysis (no further transformations needed).

Use a Dataflow When:

You want to **standardize data cleaning** (e.g., removing nulls, merging tables).

Multiple datasets need the **same transformed data**.

You need **computed tables** (e.g., aggregated sales by region).

Example Workflow

Dataflow: Extract and clean raw sales data from SQL + Excel.

Dataset: Load the dataflow output, add DAX measures (Total Sales = SUM(Sales[Amount])).

Report: Build visuals using the dataset.

Key Takeaways

Dataflows = ETL layer (prepare data for analysis).

Datasets = Analytics layer (enable reporting & dashboards).

Dataflows **reduce redundancy** (one transformation, many datasets).

Datasets **enable business logic** (DAX, RLS, relationships).

10.When and why would you use a dataflow instead of a dataset?

When and Why to Use a Dataflow Instead of a Dataset in Power BI

Dataflows and datasets serve different purposes in the analytics pipeline. Here's when and why you'd choose a **dataflow** over a dataset:

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1. When to Use a Dataflow

⩗ **Scenario 1: Reusable Data Preparation**

Why? Avoid repeating the same ETL (Extract, Transform, Load) steps across multiple datasets.

Example: Clean and standardize customer data once in a dataflow, then reuse it in **multiple datasets** (e.g., Sales, Marketing).

✅ Scenario 2: Centralized Data Governance

Why? Ensure consistency in business logic (e.g., fiscal year definitions, currency conversions).

Example: A "Calendar" dataflow ensures all reports use the same date hierarchy.

✅ Scenario 3: Incremental Data Loading

Why? Reduce refresh times for large datasets by preprocessing only new data.

Example: A dataflow filters and aggregates daily transaction logs before loading into a dataset.

✅ Scenario 4: Combining Disparate Data Sources

Why? Merge data from SQL, Excel, and SharePoint **before** it enters the dataset.

Example: A dataflow combines CRM (Salesforce) and ERP (SAP) data into a single table.

✅ Scenario 5: Advanced Transformations (Computed Entities)

Why? Use Power Query's **computed tables** for complex logic (e.g., rolling averages).

Example: A dataflow calculates YoY growth metrics before the dataset applies DAX measures.

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2. When to Use a Dataset Instead

✖ Don't Use a Dataflow If:

You need **DAX measures, hierarchies, or RLS** (these belong in datasets).

Your data is already clean and ready for analysis (no transformation needed).

You're using **DirectQuery/Live Connection** (dataflows are for imported data).

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3. Key Benefits of Dataflows Over Datasets

Benefit	Dataflow	Dataset

Benefit	Dataflow	Dataset
Reusability	✅ One transformation, many datasets	❌ Tied to a single report/model
Performance	✅ Pre-aggregates data (faster refreshes)	❌ Refreshes raw data every time
Governance	✅ Centralized business logic	❌ Logic scattered across datasets
Cost Efficiency	✅ Reduces redundant processing	❌ May duplicate ETL efforts

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Real-World Example

Problem: A retail company has:

Sales data in **SQL** (millions of rows)

Product metadata in **Excel**.

Store locations in **SharePoint**.

Solution:

Dataflow: Combines and cleans all three sources into a single "Retail Master" table.

Dataset: Imports the dataflow, adds DAX measures (Total Sales, Profit Margin).

Report: Visualizes the dataset with interactive dashboards.

Outcome:

Faster refreshes (dataflow handles the heavy lifting).

Consistent metrics (all reports use the same cleaned data).

Key Takeaways

Use a dataflow for **ETL, reuse, and governance**

Use a dataset for **analytics, DAX, and reporting**.

Dataflows **optimize performance** and **reduce redundancy**.

11. What are dashboards in Power BI Online? How are they different from reports?

Dashboards vs. Reports in Power BI Online: Key Differences

Dashboards and reports serve distinct purposes in **Power BI Online (Service)**, though they're often used together. Here's how they compare:

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1. Power BI Dashboards

What They Are:

Single-page visual summaries of key metrics (like a "digital dashboard" in a car).

Collections of pinned tiles from one or more reports or datasets.

Static (no direct data interaction, but supports cross-filtering if linked to reports).

Key Features:

✅ **Multi-report aggregation** (tiles from different reports on one screen).

✅ **Real-time data** (if connected to streaming datasets).

✅ **Mobile-friendly** (optimized for phones/tablets).

✅ **Alerts** (notify users when metrics hit thresholds).

When to Use:

Executive summaries (high-level KPIs).

Monitoring real-time data (e.g., live sales, IoT sensors).

Combining insights from multiple reports.

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2. Power BI Reports

What They Are:

Multi-page, interactive documents built on a single dataset.

Full exploration capabilities (filtering, drilling, slicers).

Created in Power BI Desktop (or edited in Service).

Key Features:

✅ **Interactive visuals** (users can slice/dice data).

✅ **Multiple pages** (organized by themes, e.g., Sales, Inventory).

✅ **Direct connection to one dataset** (semantic model).

✅ **Bookmarks & drill-through** (guided analytics).

When to Use:

Detailed data analysis (ad-hoc exploration).

Collaborative editing (teams refining visuals)

Parameterized what-if scenarios.

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3. Key Differences Summary

Feature	Dashboard	Report
Pages	Single page	Multiple pages
Data Sources	Tiles from multiple reports/datasets	Single dataset
Interactivity	Limited (click tiles to open reports)	Full (filters, slicers, drill-down)
Creation Tool	Power BI Service only	Power BI Desktop or Service
Real-Time Data	✅ Yes (if configured)	✖ No (unless DirectQuery)
Alerts	✅ Yes	✖ No
Mobile Layout	Auto-optimized	Requires manual adjustment

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4. How They Work Together

Step 1: Build a **report** in Power BI Desktop (e.g., "Sales Analysis").

Step 2: Publish to Power BI Service.

Step 3: Pin key visuals to a **dashboard** (e.g., "Executive Sales Snapshot").

Step 4: Share the dashboard with stakeholders for quick insights.

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5. Pro Tips

Dashboards are for **monitoring**; **reports** are for **analysis**

Use **Q&A** on dashboards for natural language queries.

Apps bundle dashboards/reports for streamlined sharing.

12.How do you pin a visual to a dashboard from a report?
How to Pin a Visual to a Dashboard in Power BI Service

Pinning visuals from a report to a dashboard lets you create a consolidated view of key metrics.

Here's how to do it:

Step-by-Step Guide

Prerequisites

☑ You have **edit access** to the report and dashboard.

☑ The report is published to **Power BI Service**.

Method 1: Pin from Report Editor (Power BI Service)

Open the Report

Go to your **workspace** in Power BI Service.

Open the report containing the visual you want to pin.

Hover Over the Visual

Click the **Pin ( ) icon** in the top-right corner of the visual.

https://docs.microsoft.com/en-us/power-bi/create-reports/media/service-dashboard-pin-tile-from-report/pin-visual.png

Choose a Dashboard

Select an **existing dashboard** or create a **new one**.

Click **Pin**.

Customize the Tile (Optional)

Resize/rearrange it on the dashboard.

Add a **subtitle, hyperlink, or alert** (via **Edit tile**).

Method 2: Pin from Power BI Desktop (Before Publishing)

In **Power BI Desktop**, go to **View → Mobile Layout**.

Drag visuals into the mobile view (they'll auto-pin when published).

Publish to Power BI Service → visuals appear in the dashboard.

Key Notes

Live Tiles: Pinned visuals **auto-update** when the report refreshes.

Cross-Filtering: Clicking a dashboard tile opens the underlying report.

Tile Types: You can also pin **entire report pages** (as a single tile).

Troubleshooting

✕ **"Pin" option missing?** → Check edit permissions.

✕ **Tile not updating?** → Verify dataset refresh schedules.

13.What is the mobile view in Power BI and why is it useful?
What is the Mobile View in Power BI?

The **Mobile View** in Power BI is a feature that lets you **optimize dashboards and reports for phones and tablets**. It ensures that visuals are displayed clearly and interactively on smaller screens, improving usability for on-the-go users.

Why is Mobile View Useful

1. Responsive Design for Any Device

Automatically adjusts **layout, text size, and visuals** for mobile screens.

Avoids awkward zooming/scrolling on small devices.

2. Customizable Mobile Layouts

Rearrange visuals **specifically for mobile** without affecting the desktop view.

Hide non-critical visuals to **simplify mobile consumption**.

3. Offline Access (Power BI Mobile App)

View dashboards/reports **without internet** (cached data).

Great for field teams (sales, logistics, etc.).

4. Touch-Friendly Interactivity

Supports **tap-to-filter, swipe gestures, and drill-down**.

Mobile-optimized **slicers and buttons**.

5. Faster Decision-Making

Executives and managers can check **real-time KPIs** anytime, anywhere.

How to Set Up Mobile View

In Power BI Desktop:

Open your report → Go to **View** tab → Select **Mobile Layout**.

Drag and resize visuals to fit the **phone canvas**.

Publish to Power BI Service → Mobile layout is preserved.

In Power BI Service:

Open a dashboard → Click **Edit** → Select **Mobile Layout**.

Rearrange tiles for phones/tablets.

https://docs.microsoft.com/en-us/power-bi/create-reports/media/power-bi-mobile-apps/power-bi-phone-report-edit.png

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Key Scenarios for Mobile View

Sales Teams: Check live performance metrics during client meetings.

Operations: Monitor warehouse/logistics dashboards on tablets.

Executives: Review financial summaries on the go.

Limitations

Not all visuals are mobile-optimized (custom visuals may need testing).

Reports require manual mobile layout setup; **dashboards** auto-adapt but can be customized.

Pro Tip

Use the **Power BI Mobile App** (iOS/Android) for the best experience, including:

Offline mode

Push notifications (for data alerts)

Barcode scanning (to filter reports by product IDs)

14.What is a paginated report in Power BI and when would you use it?
What is a Paginated Report in Power BI?

A **paginated report** is a highly formatted, pixel-perfect report designed for **printing or PDF export**. Unlike interactive Power BI reports, paginated reports:

Are **static** (no cross-filtering or slicers).

Display **all data** (even thousands of rows) across multiple pages.

Support **precise layout control** (headers, footers, page breaks).

Built using **Power BI Report Builder** (similar to SQL Server Reporting Services/SSRS), they're ideal for **operational or regulatory documents**.

When to Use Paginated Reports?

1. Legal/Financial Documents

Example: Monthly invoices, tax filings, or audit reports requiring **exact formatting**.

2. Large Tabular Data Exports

Example: Exporting a 10,000-row sales transaction list to **PDF/Excel**.

3. Printed Reports

Example: Patient health records, shipping labels, or compliance certificates.

4. Scheduled Distribution

Example: Automatically emailing a **daily inventory report** as a PDF attachment.

5. Parameter-Driven Static Reports

Example: A sales report filtered by region, generated on-demand for managers.

Key Features

Feature	Description
Pixel-Perfect Layout	Control margins, page breaks, and headers/footers.
Multi-Page Support	Automatically splits large datasets across pages.

Feature	Description
Export Formats	PDF, Excel, Word, PowerPoint, CSV.
Data Sources	DirectQuery, SQL, Azure, etc. (no Power Query).
Subscription	Automatically email reports on a schedule.

Paginated Report vs. Power BI Report

Aspect	Paginated Report	Standard Power BI Report
Interactivity	✘ No	✓ Yes (filters, slicers, drill-down)
Data Volume	✓ Handles millions of rows	✘ Limited by dataset size
Formatting	✓ Precise control (like Word)	✘ Responsive (no fixed pages)
Use Case	Printing/PDFs, regulatory docs	Interactive dashboards, analytics

How to Create a Paginated Report?

Prerequisite: Power BI Premium or Premium Per User (PPU) license.

Tool: Use **Power BI Report Builder** (free download).

Steps

Connect to a data source (SQL, Azure, etc.).

Design the layout (tables, matrices, charts).

Publish to **Power BI Service** under a Premium workspace.

Example Workflow

HR Department needs **employee payroll slips** in PDF format.

Build a paginated report with:

Company logo (header).

Employee details (table).

Deductions breakdown (matrix).

Page break per employee.

Schedule it to auto-email every month.

Limitations

Requires **Premium/PPU** (not available in Pro).

No **Power Query transformations** (must use SQL/DAX).

Less interactive than standard reports.

When to Avoid Paginated Reports?

For **interactive analytics** (use standard Power BI reports).

If you need **real-time data exploration**.

Need help **designing your first paginated report**?

15.Can you export reports from Power BI Service to PDF or PowerPoint? How?
Exporting Reports from Power BI Service to PDF or PowerPoint

Yes! Power BI lets you export reports to **PDF, PowerPoint (PPTX), or other formats** for offline

sharing or presentations. Here's how:

Option 1: Export to PDF (Best for Printing/Archiving)

Steps:

Open the report in Power BI Service (app.powerbi.com).

Click **File → Export → PDF**.

(For dashboards, select **Print Dashboard** → Save as PDF.)

Choose layout:

Actual Size (1:1 scaling) or

Fit to Page (adjusts to paper size).

Click **Export** and save the file.

Notes:

Requires a **Power BI Pro or Premium** license.

Visuals are static (no interactivity).

Page breaks are automatic (customize via **Paginated Reports** if needed).

Option 2: Export to PowerPoint (Best for Presentations)

Steps:

Open the report in Power BI Service.

Click **File → Export → PowerPoint**.

Choose:

Current page only or **All pages**.

Include report filters (optional).

Click **Export** → PPTX downloads automatically

Notes:

Each report page becomes a **separate slide**.

Dynamic visuals (like slicers) become **static images**.

Charts retain colors/fonts from the Power BI theme.

Option 3: Export to Excel (For Data Analysis)

Click **Export → Underlying data** (for raw numbers) or **Summarized data** (for aggregated visuals).

Opens in Excel for further analysis.

Key Limitations

Format	Pros	Cons
PDF	High-quality print output	No interactivity
PowerPoint	Easy for presentations	Static images only
Excel	Raw data for analysis	Loses visual formatting

Pro Tips

For pixel-perfect PDFs, use **Paginated Reports** (Premium feature).

Schedule PDF exports with **Power Automate** (auto-email reports).

Mobile exports work in the **Power BI Mobile App** (tap **Share → Export**).

16.What does "Live Connection" mean in Power BI Service, and how does it work?
What is a "Live Connection" in Power BI Service?

A **Live Connection** is a direct, real-time link between **Power BI reports/dashboards** and an external **analytical database** (like SQL Server Analysis Services, Azure Analysis Services, or Power BI datasets). Unlike imported data, it **doesn't store data in Power BI**—instead, it queries the source system dynamically whenever a user interacts with the report.

How Does It Work?

Connect to a Data Source:

Ideal for **centralized enterprise models** (SSAS/AAS).

Not for ad-hoc transformations—requires upfront modeling.

In **Power BI Desktop**, select **Get Data → Analysis Services** (or another supported live source).

Enter server details and credentials.

Build Reports on Live Data:

All visuals and filters query the **source database in real time**.

No data is copied or stored in Power BI (only metadata like measures/relationships is cached).

Publish to Power BI Service:

The live connection persists, and reports continue querying the source system.

Key Features

✓ **Real-Time Data**: Always reflects the latest source data.

✓ **No Refresh Needed**: Eliminates scheduled refreshes (unlike Import Mode).

✓ **Leverages Source Compute**: Uses the power of the external database (e.g., SSAS).

✓ **Single Source of Truth**: Ensures consistency with centralized business logic (DAX measures in SSAS).

When to Use a Live Connection?

Enterprise Semantic Models: When using **SSAS, AAS, or Power BI datasets** as a single source.

Large Datasets: Avoids importing millions of rows into Power BI.

Real-Time Analytics: For stock markets, IoT dashboards, or live operational data.

Governance: Enforces **row-level security (RLS)** defined in the source system.

Limitations

✗ **No Power Query**: Transformations must be done in the source system.

✗ **Limited Offline Access**: Requires an active connection to the source.

✗ **Performance Dependency**: Speed depends on the external database's load.

✗ **Premium Required**: For Power BI datasets as a source, Premium capacity is needed.

Live Connection vs. Other Modes

Feature	Live Connection	Import Mode	DirectQuery

Feature	Live Connection	Import Mode	DirectQuery
Data Storage	None (external)	In Power BI	None (external)
Refresh Needed?	Never	Scheduled	On interaction
Transformations	Source-only	Power Query	Source-only
Best For	SSAS/AAS models	Small datasets	Large DBs (SQL, Snowflake)

Example Workflow

IT Team creates a **SSAS Tabular model** with sales KPIs.

Analyst connects Power BI via Live Connection to SSAS.

Report shows real-time sales data without manual refreshes.

Key Takeaway
Live Connection = Real-time reports + No data duplication.

17.Explain Row-Level Security (RLS) and how it's applied in Power BI Online.
Row-Level Security (RLS) in Power BI Online: Explained

Row-Level Security (RLS) restricts data access at the **row level** based on user roles, ensuring users only see data they're authorized to view. For example:

A **sales rep** sees only their region's data.

An **HR manager** accesses only their department's employee records.

How RLS Works in Power BI Online

1. Define Roles

Create roles in Power BI Desktop or Service that map to business logic (e.g., "Sales_Manager," "Region_East").

2. Apply DAX Filters

Write **DAX expressions** to filter data dynamically. Examples:

By User Login:

dax
[Region] = USERNAME() *// Filters data to the user's region*

By Team Membership:

dax
[Department] = LOOKUPVALUE(EmployeeTable[Department], EmployeeTable[Email], USERNAME())

3. Assign Users to Roles

In **Power BI Service**:

Go to the dataset's **Security settings**.

Add users/groups to roles (e.g., john@company.com → Sales_Manager).

4. Test Roles

Use **"View as"** in Power BI Service to verify filters work before sharing.

Key Features of RLS in Power BI Online

✓ **Dynamic Filtering**: Filters apply automatically based on user identity.

✓ **Works with Live/DirectQuery**: No data duplication needed.

✓ **Cloud-Compatible**: Integrates with Azure AD/Office 365 logins.

✓ **Audit Support**: Track access via audit logs.

RLS vs. Other Security Methods

Method	Scope	Use Case
RLS	Row-level data filtering	Restrict access to specific rows.
Object-Level	Reports/dashboards	Control who sees entire reports.
Workspace	Access to content	Manage edit/view permissions.

Example: Implementing RLS for Sales Data

Dataset: Contains a Sales table with Region, SalesRep, and Revenue.

Role: Create a role Region_Filter with DAX:

```dax
[SalesRep] = USERNAME()
```

Assign: Add sales reps to the role in Power BI Service.

Result: Each rep sees only their own transactions.

Limitations

✘ **No Column-Level Security**: Use **Object-Level Security** to hide entire columns.

✘ **Manual User Assignment**: Requires maintenance as teams change.

✘ **Performance Impact**: Complex DAX can slow down queries.

Pro Tips

Use **USERPRINCIPALNAME()** for email-based filtering.

Combine RLS with **workspace roles** for layered security.

For **large datasets**, optimize DAX to avoid slowdowns.

Need help writing **dynamic RLS DAX filters**?

18.How can you test RLS roles in Power BI Service?
How to Test RLS (Row-Level Security) Roles in Power BI Service

To ensure your RLS filters work correctly before sharing reports, Power BI provides built-in testing tools. Here's how to validate roles:

Method 1: Use "View as Roles" in Power BI Service (Recommended)

Steps:

Open the report/dashboard in Power BI Service.

Click ••• **(More options)** → **Security** → **Manage roles**.

Select a **role** (e.g., "Sales_Manager") → Click **Test as role**.

Optional: Add **other users** (e.g., john@company.com) to simulate their access.

Click **OK** → The report reloads with **RLS filters applied**.

Verify the data is filtered correctly (e.g., only "East Region" sales appear).

https://docs.microsoft.com/en-us/power-bi/enterprise/media/service-admin-rls/rls-test-role.png

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Method 2: Test in Power BI Desktop First (During Development)

In **Power BI Desktop**, go to **Modeling** → **Manage roles**.

Define roles and DAX filters (e.g., [Region] = "East").

Click **View as** → Select a role → **OK**.

The report preview updates to reflect RLS filters.

Method 3: Use DAX Functions for Dynamic Testing

For complex scenarios (e.g., user-specific filters), use:

USERNAME(): Tests with your login (e.g., your-email@company.com).

USERPRINCIPALNAME(): Similar but ensures Azure AD compatibility.

Example DAX Filter:

dax

[SalesRep] = USERNAME() *// Filters data to the current user*

Key Notes

✅ **Works with Live/DirectQuery**: RLS filters pass to the source system.

✅ **No affect on admins**: Admins see all data unless testing a role.

✖ **No bulk testing**: Test roles one at a time.

Troubleshooting RLS

Issue: Users see all data.

Fix: Ensure they're assigned to the correct role in **Power BI Service**.

Issue: DAX filter errors.

Fix: Validate syntax (e.g., USERNAME() vs. USERPRINCIPALNAME()).

Pro Tip

Combine RLS with **workspace access controls** for end-to-end security.

19.What are Apps in Power BI and how do you publish one?
What Are Power BI Apps?

Power BI Apps are curated collections of **dashboards and reports** packaged for easy distribution

to end users. Unlike workspaces (where content is developed), apps provide a **user-friendly,**

read-only interface for business teams, executives, or clients.

Key Benefits:

✓ **Simplified Access**: Users get one link to all relevant content.

✓ **Automatic Updates**: Changes in the workspace sync to the app.

✓ **Custom Branding**: Add logos, themes, and custom navigation.

✓ **Security**: Inherits RLS (Row-Level Security) from the workspace.

How to Publish a Power BI App

Prerequisites

A **workspace** (Power BI Pro or Premium capacity).

Published **dashboards/reports** in the workspace.

Step-by-Step Guide

1. Prepare Content in a Workspace

Ensure all dashboards/reports are finalized in a **workspace** (e.g., "Sales Analytics").

2. Create the App

Go to the workspace → Click **Create app**.

Configure App Details:

Name & Description: e.g., "Q3 Sales Performance App".

Logo/Theme: Upload a company logo for branding.

Navigation: Organize tabs (e.g., "Overview," "Regional Data").

Select Content:

Choose which **dashboards/reports** to include.

Set a **landing page** (default view when users open the app).

Permissions:

Who can see the app? (Entire org, specific groups, or individuals).

Install automatically (Push to users without manual installation).

Advanced Settings (Optional):

Enable **RLS** (if row-level security is needed).

Allow **exporting data** (if users need Excel/PDF exports).

3. Publish the App

Click **Publish app** → Share the **app link** with users.

https://docs.microsoft.com/en-us/power-bi/collaborate-share/media/service-create-distribute-apps/power-bi-app-publish.png

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How Users Access the App

Direct Link: Sent via email or embedded in SharePoint/Teams.

Power BI Service: Users find it under **Apps** in the left sidebar.

Mobile: Available in the **Power BI Mobile app**.

Updating an App

Make changes in the **workspace**.

Return to the app → **Update app** → Republish.

Users see updates **automatically** (no re-installation needed).

App vs. Workspace vs. Dashboard

Feature	App	Workspace	Dashboard
Purpose	Distribute finalized content	Develop and edit reports	Single-page KPI summary
Audience	End users (read-only)	Report creators	Viewers (interactive)
Updates	Manual republish	Real-time edits	Pinned from reports

Pro Tips

Use **Apps for departments** (e.g., "HR Analytics App").

Combine with **RLS** to personalize data for different teams.

Monitor usage (via App usage metrics in Power BI Service).

20.What are some key benefits of using the Power BI Online Service in enterprise environments?

Key Benefits of Power BI Online Service for Enterprises

Power BI Online (Power BI Service) is a **cloud-based analytics platform** that transforms enterprise data into actionable insights. Here's why it's a game-changer for large organizations:

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1. Centralized Collaboration & Governance

✅ **Shared Workspaces**: Teams collaborate on dashboards/reports in real time.

✅ **Role-Based Access Control (RBAC)**: Define permissions (Admin, Contributor, Viewer) for secure access.

✅ **Unified Data Governance**: Integrates with **Microsoft Purview** for compliance (GDPR, HIPAA).

2. Scalability with Power BI Premium

⚡ **Dedicated Cloud Capacity**: Handle massive datasets (up to **400TB** with Premium).

⚡ **Free Viewer Access**: Share reports with unlimited users **without Pro licenses** (Premium only).

⚡ **Auto-Scaling**: Handles peak workloads without performance drops.

3. Real-Time Analytics & AI Integration

Live Dashboards: Monitor IoT, sales, or operations in real time.

AI-Powered Insights: Use **AutoML, Cognitive Services, and Quick Insights** for predictive analytics.

4. Seamless Integration with Microsoft Ecosystem

Microsoft 365: Embed reports in **Teams, SharePoint, and Outlook**.

Azure Synapse & Data Lake: Connect to enterprise data warehouses.

Power Platform: Automate workflows with **Power Automate** and **Power Apps**.

5. Enterprise-Grade Security

Row-Level Security (RLS): Restrict data access by user roles.

Azure AD Integration: Enforce **multi-factor authentication (MFA)** and conditional access.

Encryption: Data encrypted in transit and at rest.

6. Cost Efficiency

Pro License ($10/user/month): Affordable for analysts.

Premium Capacity ($4,995+/month): Cost-effective for large deployments (no per-user fees for viewers).

7. Self-Service Analytics

Drag-and-Drop Tools: Business users create reports without IT help.

Mobile Accessibility: iOS/Android apps for on-the-go insights.

8. Automated Refresh & Monitoring

⏰ **Scheduled Refresh**: Keep data up to date (up to **48x/day** with Premium).

Usage Metrics: Track report performance and user engagement.

9. Global Deployment Flexibility

Multi-Geo Support: Deploy data in specific regions for compliance.

Disaster Recovery: Built-in redundancy with Azure's global infrastructure.

10. Apps for Controlled Distribution

Curated Content: Package dashboards/reports into **apps** for departments (e.g., "Finance App").

One-Click Updates: Push changes to all users instantly.

Comparison: Power BI Online vs. On-Premises

Feature	Power BI Online	Power BI Report Server
Deployment	Cloud (SaaS)	On-premises

Feature	Power BI Online	Power BI Report Server
Real-Time Data	✅ Yes	✖ Limited
AI & Advanced Analytics	✅ Yes	✖ No
Scalability	✅ Auto-scaling	✖ Hardware-dependent
Cost	Subscription-based	Upfront licensing

Enterprise Use Cases

Sales & Marketing: Track campaign ROI in real time.

Supply Chain: Monitor inventory levels with IoT data.

Finance: Automated financial reporting with **Paginated Reports**.

HR: Employee performance dashboards with **RLS**.

Why Enterprises Choose Power BI Online?

Faster time-to-insight than traditional BI tools.

Reduces IT dependency with self-service analytics.

Future-proof with continuous Microsoft updates (e.g., **Fabric integration**).