Question 1. Differentiate Scheduled refresh & incremental refresh

Incremental Refresh and Scheduled Refresh in Power BI serve different purposes:

Incremental Refresh:

1) Refreshes only new or changed data since the last refresh.

2) Efficient for large datasets, reducing the time and resources needed for updates.

3) Works by partitioning data, typically based on time periods like days or months.

4) Ideal for scenarios where only recent data needs updating while historical data remains static.

Scheduled Refresh:

1) Refreshes the entire dataset at specified intervals (e.g., daily, weekly).

2) Reloads all data, regardless of changes or size, which can be resource-intensive for large datasets.

3) Ensures that the dataset is consistently up-to-date based on the schedule.

In summary, Incremental Refresh optimizes performance by updating only relevant data,

while Scheduled Refresh ensures data freshness by reloading the entire dataset at regular intervals.

Question 2. What is a gateway ? Explain different types of gateways.

In Power BI, a gateway serves as a crucial link between on-premises data sources and the Power BI service in the cloud. It facilitates secure data transfer, allowing cloud-based Power BI reports and dashboards to access and refresh data stored within local databases, files, and other systems.

There are two main types of gateways in Power BI: Personal Mode and Standard Mode. The Personal Mode gateway is intended for individual use. It allows a single user to connect their local data sources with Power BI and manage data refreshes directly from their personal computer. This type of gateway is ideal for personal projects or small-scale scenarios where a single user requires access to on-premises data. However, it has limitations in terms of scalability and user management, as it can only be used by the person who installed it.

On the other hand, the Standard Mode gateway, also known as the On-Premises Data Gateway (Standard Mode), is designed for enterprise-level use. This gateway is installed on a dedicated server or machine within an organization, making it accessible to multiple users and providing centralized management. It supports a broader range of data sources and allows for both scheduled and real-time data refreshes. The Standard Mode gateway is suitable for larger, more complex environments where robust data integration and management are required.

In summary, while the Personal Mode gateway caters to individual users with simpler needs, the Standard Mode gateway is geared towards larger organizations requiring a scalable and manageable solution for connecting on-premises data with Power BI.

Question 3. what is the difference between direct query & import mode?

In Power BI, DirectQuery and Import Mode are two methods for connecting to and interacting with data sources. They handle data retrieval and storage differently, impacting performance, data freshness, and the overall user experience.

DirectQuery mode allows Power BI to query the data source in real-time without importing the data into Power BI's internal storage. When using DirectQuery, queries are sent directly to the data source each time you interact with a report or dashboard. This approach ensures that users see the most up-to-date data since no data is stored within Power BI itself. However, DirectQuery can lead to performance issues if the underlying data source is slow or if complex queries are involved. It also places more

load on the data source and might be subject to data source query limitations or performance constraints.

Import Mode, on the other hand, involves importing data from the source into Power BI's internal storage. When data is imported, Power BI creates a local copy of the data which is stored in-memory. This mode allows for faster performance and more advanced analytics because Power BI processes queries against the in-memory dataset rather than querying the external source each time. Import Mode also supports more extensive data transformations and modeling capabilities within Power BI. However, the data can become stale if not refreshed regularly, as it only reflects the state of the source data at the time of the last import.

In essence, DirectQuery provides real-time data access at the cost of potentially slower performance and reliance on the data source's responsiveness, while Import Mode offers improved performance and rich analytical capabilities but requires periodic data refreshes to ensure data accuracy. The choice between the two modes depends on the specific needs for data freshness, performance, and the capabilities of the data source.

Question 4. What is Row Level Security ? Explain dynamic & static Row Level Security.

Row-Level Security (RLS) in Power BI is a feature that allows you to control access to data at a granular level, ensuring that users only see the data they are permitted to access. This is particularly useful in scenarios where you want to restrict data visibility based on user roles or attributes, such as in multi-departmental organizations or applications with different user roles.

Dynamic Row-Level Security

Dynamic Row-Level Security is a method where the data that a user can see is determined dynamically based on the user's identity or role at runtime. This is achieved by using DAX (Data Analysis Expressions) filters that evaluate each user's credentials or attributes against the data in the model.

In practice, you typically set up a security table that maps users to the data they should be able to access. This table is then joined with your main data table using relationships and DAX expressions. For example, a security table might include user IDs and department IDs, allowing users to only see data for their specific department.

Example Setup for Dynamic RLS:

1. Create a Security Table: This table maps users to the data they should be able to access (e.g., `UserSecurity` with columns `UserID` and `DepartmentID`).

2. Define Roles: In Power BI Desktop, define roles using DAX functions such as `USERNAME()` to filter data based on the logged-in user.

3. Apply Filters: Set up DAX filters in the role definition to ensure users see data relevant to their role.

Static Row-Level Security

Static Row-Level Security involves defining fixed roles and their corresponding data access permissions that do not change based on the user. This approach requires manually configuring each role and the associated filters that dictate which data each role can access. Static RLS is useful when data access requirements are consistent and predefined.

Example Setup for Static RLS:

1. Define Roles: In Power BI Desktop, create roles that represent different access levels or groups, such as "Manager" or "Sales".

2. Apply Filters: Define fixed DAX filters for each role. For instance, a role for the "Sales" team might be filtered to only show sales data, while a "Manager" role might include data across multiple regions or departments.

3. Assign Users: Map users to these roles through the Power BI service, ensuring that they see only the data permitted by their assigned role.

Summary

Dynamic Row-Level Security allows for flexible, user-specific data access based on dynamic criteria such as user identity, making it suitable for scenarios where user access needs to adapt based on individual attributes. Static Row-Level Security, conversely, involves predefined roles with fixed access permissions, which is simpler to set up but less flexible. Both approaches help ensure that users access only the data relevant to their roles or responsibilities.

Question 5. What is a workspace in Power BI Service. Explain different roles in a workspace.

In Power BI Service, a workspace is a collaborative environment where you and your team can work together on Power BI reports, dashboards, datasets, and dataflows. Workspaces help manage and organize content within the Power BI Service, providing a structured space for development, sharing, and distribution of business intelligence assets.

Types of Workspaces

1. My Workspace: This is a personal workspace for individual use. It is primarily intended for personal content creation and management before publishing or sharing with others. Users have full control over their content but cannot share it with others.

2. App Workspaces: These are collaborative workspaces used by teams or organizations. App workspaces allow users to develop, review, and share content with colleagues. They provide control over permissions and roles, facilitating teamwork and content distribution.

Roles in a Workspace

Each workspace in Power BI Service has distinct roles with specific permissions. The roles are designed to control access and functionalities for different users within the workspace. The main roles are:

1. Admin:

   - Responsibilities: Admins have the highest level of access and control within a workspace. They can add or remove members, manage workspace settings, and publish content.

   - Permissions: Full control over all aspects of the workspace, including modifying roles, managing content, and configuring workspace settings.

2. Member:

   - Responsibilities: Members can contribute to the workspace by creating and editing content. They collaborate with other users and have the ability to publish reports and datasets.

   - Permissions: Can edit and manage content within the workspace, but cannot change workspace settings or manage roles.

3. Contributor:

   - Responsibilities: Contributors can create, edit, and manage content, similar to members. They are actively involved in developing reports, dashboards, and datasets.

   - Permissions: They can publish content and collaborate with others but do not have the ability to manage roles or settings.

4. Viewer:

   - Responsibilities: Viewers have read-only access to the content within the workspace. They can view and interact with reports and dashboards but cannot edit or manage any content.

   - Permissions: Limited to viewing and consuming content, with no rights to make changes or manage the workspace.

Summary

In Power BI Service, a workspace is a collaborative environment that helps organize and manage Power BI content. The main roles within a workspace are Admin, Member,

Contributor, and Viewer, each with varying levels of access and control. Admins have full control, Members and Contributors can create and manage content, and Viewers can only view content. This role-based structure ensures effective collaboration and content management in a Power BI workspace.