

DATA MANIPULATION AND REPORTING WITH POWER BI

Contents

Purpose of this Lab	
Creating Subscriptions.....	
Configure Gateway	
Install Data Gateway.....	
Configure Data Gateway	
Scheduled Data Refresh.....	
Grant Access to Objects.....	
Configure RLS (Row Level Security)	
Creating Roles.....	
Role Impersonation.....	
Publish Report to Service Account.....	
Assign User(s) to Roles.....	
Share the Report.....	
Result Check	

Purpose of this Lab

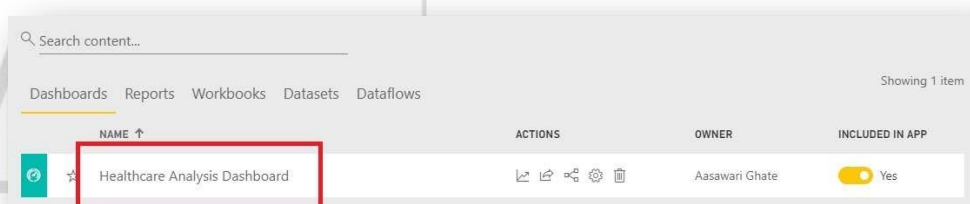
After completing this lab, you should be able to,

- Create a “Subscription” for a dashboard.
- Configure gateway and schedule data refresh.
- Selectively share a report / dashboard with other users of your organization.
- Configure Row Level Security (RLS).

Creating Subscriptions

Follow the below mentioned steps to subscribe to a dashboard.

1. Login to your service account.
2. Navigate to the App workspace you created earlier. You should also be able to see a dashboard that you might have created in the previous lab. Click on it to execute.



3. After the dashboard runs, click on “Subscribe” button that appears at the top menu bar.



4. On the “Subscribe to emails” screen,
 - a. Enter an appropriate subject line for the email that would be generated by the system (e.g. Daily subscription for Healthcare Dashboard).
 - b. Enter an appropriate message that’ll get included in the mail body (e.g. Here’s a newer version of the Healthcare Analysis Dashboard).
 - c. You can keep the “Run Now” option turned on in case you want a subscription to get generated immediately (without having to wait for the next scheduled run).

Subscribe to emails
HEALTHCARE ANALYSIS DASHBOARD

① You cannot subscribe others because this artifact has row-level security or the dataset is using a Live Connection to Analysis Services

+ Add another subscription

Healthcare Analysis Dashboard Run Now On

Subject

Daily Subscription for Healthcare Dashboard

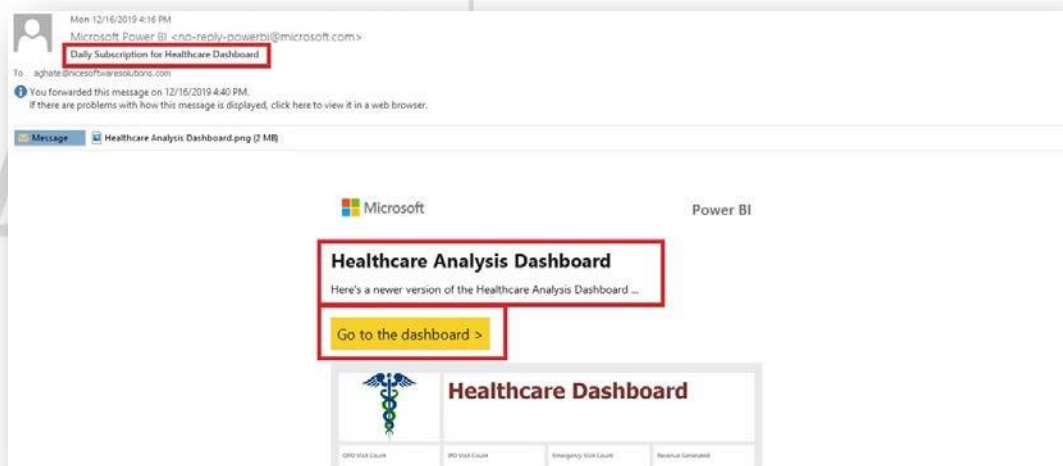
Here's a newer version of the Healthcare Analysis Dashboard ...

- d. Set the “Frequency” as “Weekly”. This will allow you to select specific days of the week.
- e. Select the checkboxes from Monday to Friday.
- f. Set a time when you’d like the subscription to get fired for the selected days (e.g. 4:15pm).
- g. Select a time zone based on which the subscription would be fired (e.g. UCT + 5:30, which is IST).
- h. Set a start and stop date for the subscription. You can choose the dates of your choice. Make sure the dates are selected in a way where you can get at least two or three deliveries.
- i. Check the checkbox that says, “Link to dashboard in PowerBI”. This will include a direct link to the dashboard in the mail body.
- j. Click on “Save and close” to create the subscription.

Subscription configuration dialog box showing the following settings:

- Days:** Sun (unchecked), Mon (checked), Tue (checked), Wed (checked), Thu (checked), Fri (checked), Sat (unchecked).
- Scheduled Time:** 4:15 PM (UTC+05:30) Chennai, Kolkata, Mumbai.
- Start date:** 12/16/2019.
- End date:** 12/20/2019.
- Also Include:** ☒ Link to dashboard in Power BI.
- Buttons:** [Manage all subscriptions](#), **Save and close**, **Cancel**.

- k. Once the subscription is fired, you'll receive an email that looks like the screenshot shown below. Observe that mail contains all the parameters you set while creating the subscription.



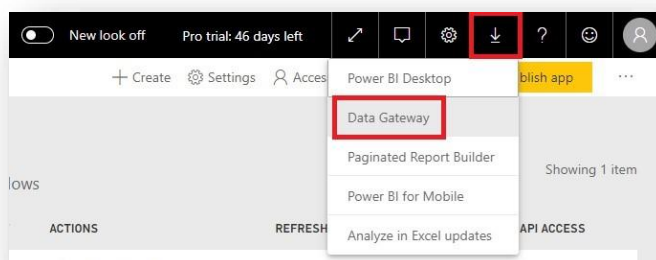
- l. Clicking on "Go to the dashboard" should open the dashboard on a web browser.

Configure Gateway

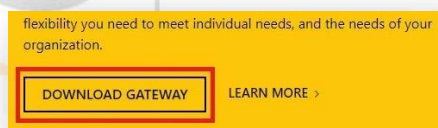
Install Data Gateway

A data gateway acts as a bridge between the data source (based on which report are created using PowerBI desktop) and the service account (where the report is published). After publishing a report to the service account, using the data gateway, you can then refresh a report dataset. Follow the below mentioned steps to download and configure the data gateway.

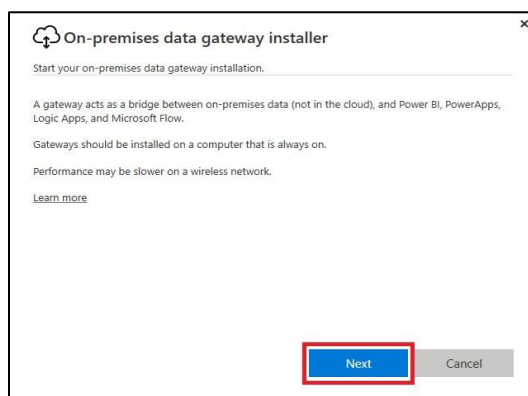
1. Login to the service account.
2. Navigate to the downloads section and click on “Data Gateway”.



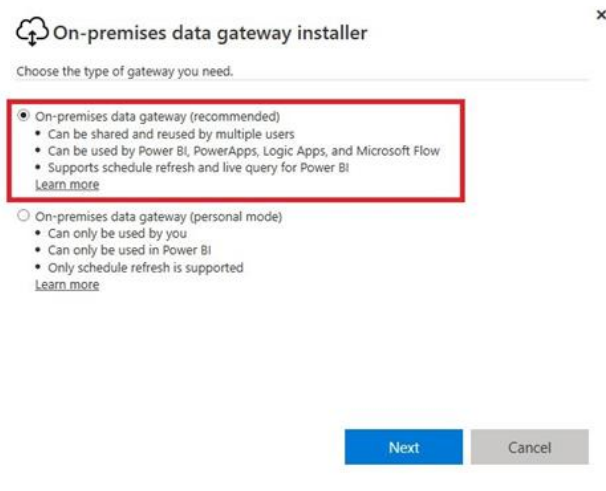
3. Once you click on the “Data Gateway” the system would open a web page where you’ll find a “Download Gateway” button, click on that to start the download.



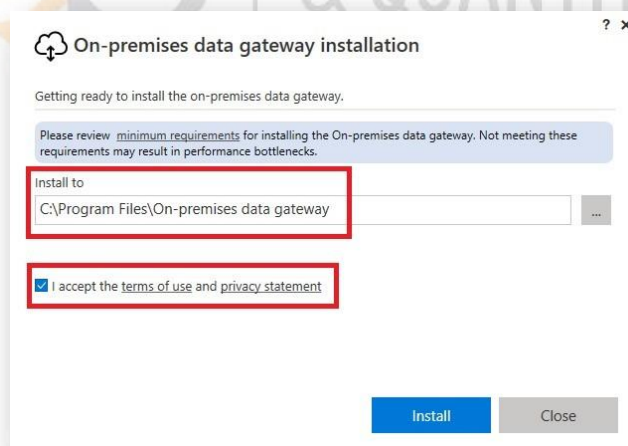
4. Once the downloader gets downloaded, run it to start the wizard. Click “Next” on the first screen.



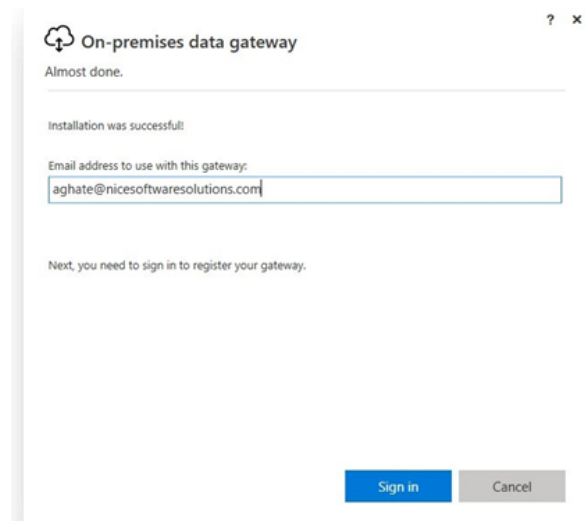
5. On the next screen, select “On-premises data gateway (recommended)” and click next. This would start the actual download and a progress bar would appear.



6. On the next screen, the default installation path would be shown which you can retain. Check the checkbox to accept the terms and conditions and click on “Next”. This will start the data gateway installation.



7. At the last phase of installation, the system would ask you to enter the credentials for the service account. Enter the account credentials and click on “Sign in”.



On-premises data gateway

Almost done.

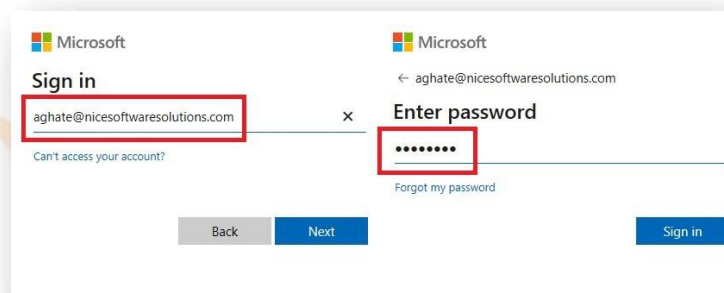
Installation was successful!

Email address to use with this gateway:

aghate@nicesoftwarewaresolutions.com

Next, you need to sign in to register your gateway.

[Sign in](#) [Cancel](#)



Microsoft

Sign in

aghate@nicesoftwarewaresolutions.com

Can't access your account?

[Back](#) [Next](#)

Microsoft

← aghate@nicesoftwarewaresolutions.com

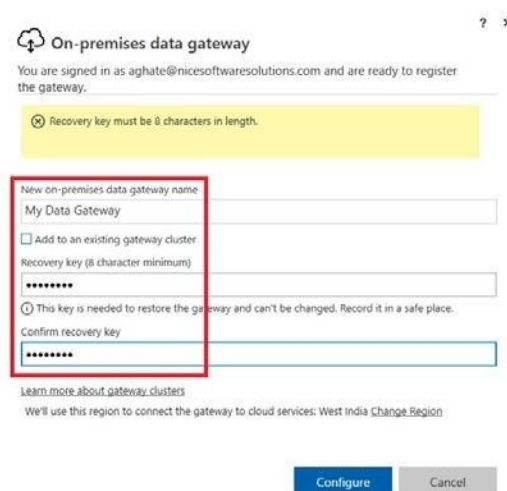
Enter password

.....

[Forgot my password](#)

[Sign in](#)

8. On the next screen, enter a name for the gateway, an 8-digit recovery key and click on “Configure”.



On-premises data gateway

You are signed in as aghate@nicesoftwarewaresolutions.com and are ready to register the gateway.

ⓧ Recovery key must be 8 characters in length.

New on-premises data gateway name

My Data Gateway

☐ Add to an existing gateway cluster

Recovery key (8 character minimum)

.....

ⓘ This key is needed to restore the gateway and can't be changed. Record it in a safe place.

Confirm recovery key

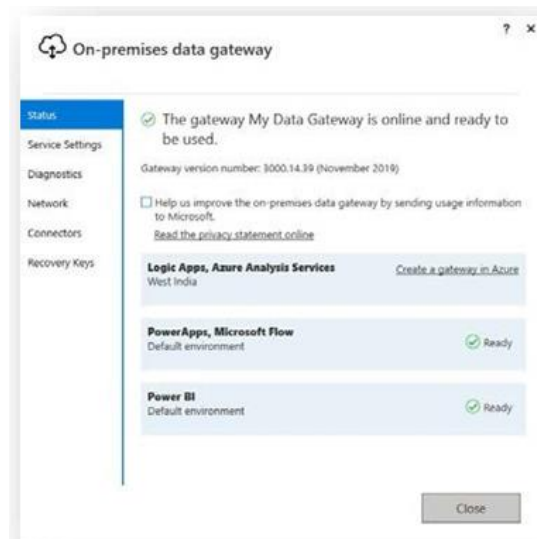
.....

[Learn more about gateway clusters](#)

We'll use this region to connect the gateway to cloud services: West India [Change Region](#)

[Configure](#) [Cancel](#)

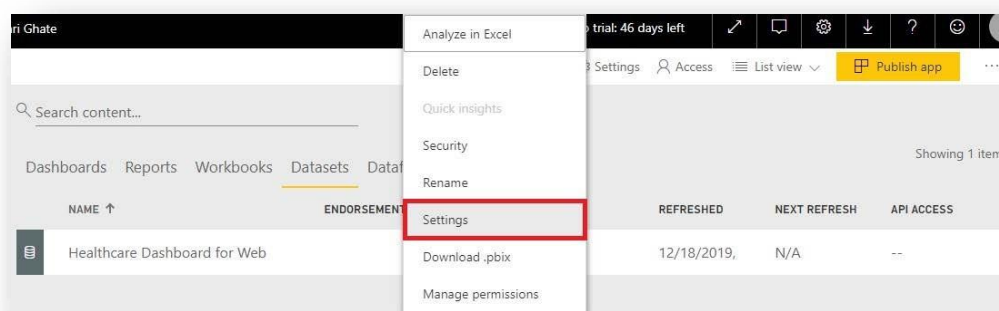
9. On the last screen, you may uncheck the “Help us improve” checkbox called and click on “Close”.



Configure Data Gateway

Once the installation is done, you need to create separate data connections for each imported file used in the dataset. Follow the below mentioned steps to create these connectors.

1. Login to the service account.
2. Expand the App workspace and go to the “Datasets” tab.
3. Next to the dataset name, you’ll find a “More Options” icon (ellipsis), click on that and select “Settings”.



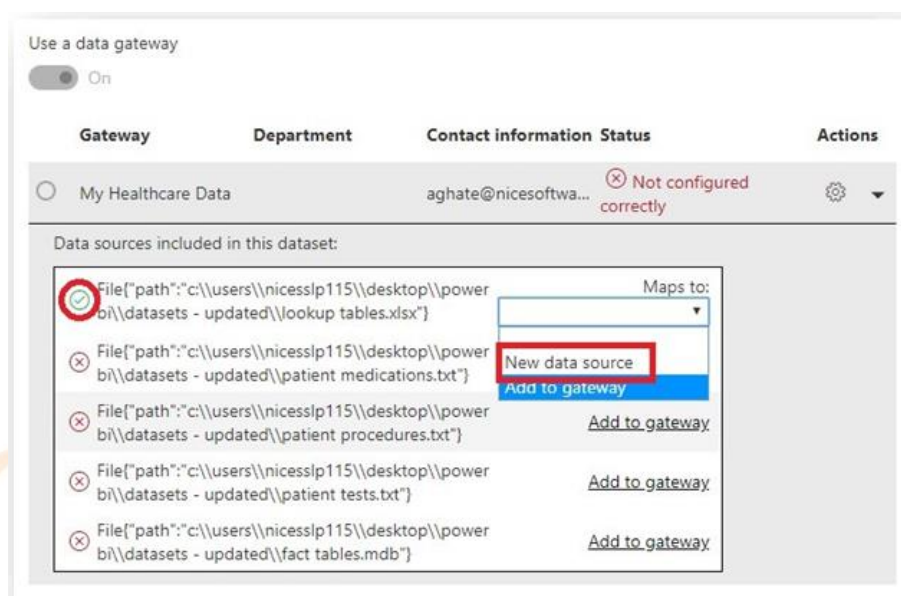
4. On the “Settings” screen, expand the “Gateway Connection” option. You shall see a gateway

installed but not online which needs to be configured. Now you need to create individual data connectors. Expand the gateway by clicking on the down arrow icon appearing under “Actions”. Now click on “Add to gateway” appearing next to the first filename.

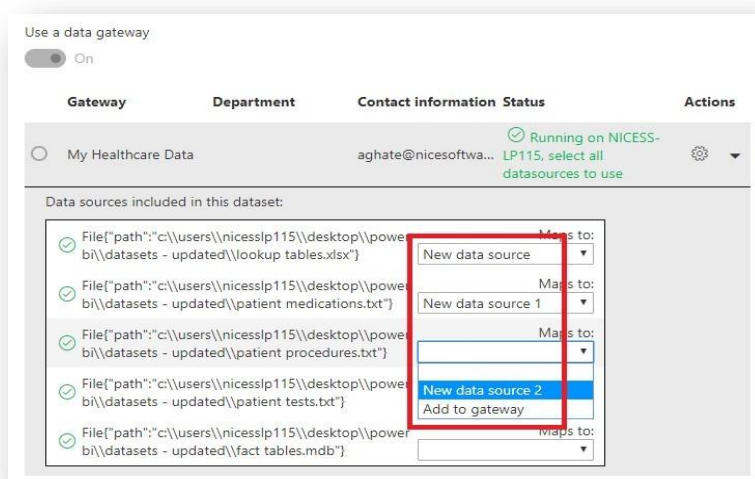


- On the “Data Source Settings” screen, enter the “Data Source Name” of your choice or leave it to default.
- Enter the “Windows username” and “Password”. These are the credentials that you use to unlock your windows machine and click on “Add”.

7. Once you click on “Add”, the system would take you back to the previous screen where you’ll see one data connector being configured.
8. Now associate the connector (you just created) with the first filename by selecting the connector name from the list (see the screenshot below).



9. Now repeat the steps from 4 to 8, which will help you to create separate data connectors for each imported file and associate them with appropriate filenames (see screenshot below).



10. Once all the connectors are tagged with appropriate filenames, click on “Apply” to save the changes.
11. Once your gateway is configured properly, you should see,
 - a. A “Running” message next to the gateway name (screenshot below).

Gateway	Department	Contact information	Status	Actions
My Healthcare Data		aghat@nicesoftwa...	Running on NICES- LP115	⚙️ ▶

- b. The “Data source credentials” section should get enabled and expandable.

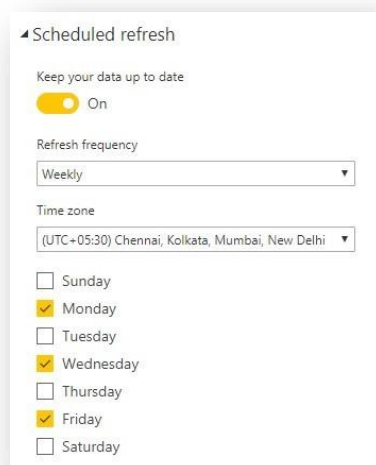
Data source credentials	
fact tables.mdb	(admin has granted access, credentials are not required)
lookup tables.xlsx	(admin has granted access, credentials are not required)
patient medications.txt	(admin has granted access, credentials are not required)
patient procedures.txt	(admin has granted access, credentials are not required)
patient tests.txt	(admin has granted access, credentials are not required)

Now that you’ve successfully installed and configured the data gateway, you can go ahead and schedule an automatic data refresh as well.

Scheduled Data Refresh

Follow the below mentioned steps to configure an automatic data refresh. Please note the maximum number of refreshes you can configure in PowerBI (for imported data) is one refresh per day. In case if you are accessing the data through a live connection then there is no limit to the number of refreshes per day.

1. On the same “Dataset Settings” page, expand the “Schedule Refresh” section.
2. Turn on automatic refresh option.
3. Set the “Refresh Frequency” to “Weekly”.
4. Select the “Time Zone” as (UTC + 05:30) – that’s IST time zone.
5. From the list of weekdays choose, “Monday”, “Wednesday” and “Friday”.



← Scheduled refresh

Keep your data up to date

☒ On

Refresh frequency

Weekly

Time zone

(UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi

☐ Sunday

☒ Monday

☐ Tuesday

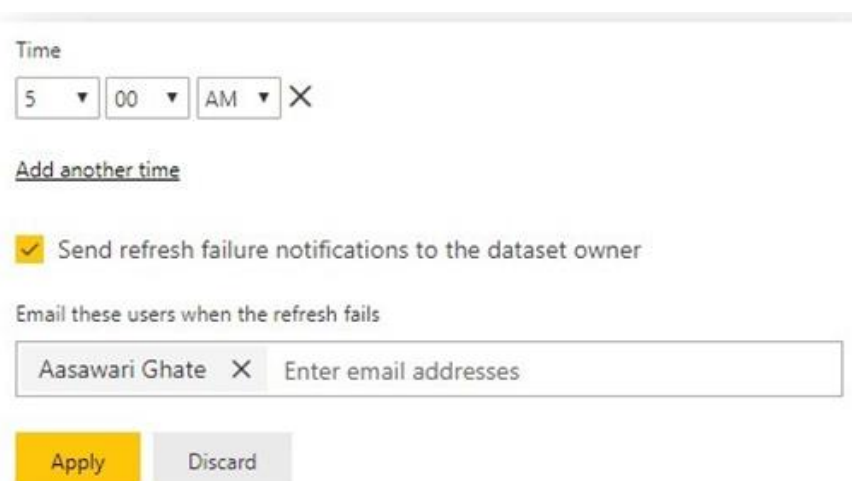
☒ Wednesday

☐ Thursday

☒ Friday

☐ Saturday

6. By default, PowerBI schedules the data refresh at midnight. However, if you want you can choose your own refresh time as well. To set your own refresh time, click on “Add another time”.
7. Set the time as per your own choice, let’s say 5am in the morning.
8. Check the checkbox that says, “Send refresh failure notification to the dataset owner”. This will send a failure notification with error details if the gateway fails to complete a scheduled data refresh.
9. Enter the email address where you’d like to receive such failure notices and click on “Apply” to create the schedule.



Time

5 00 AM X

Add another time

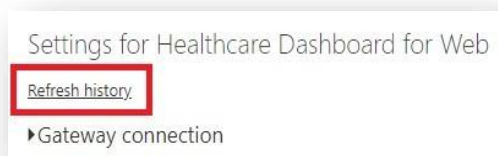
☒ Send refresh failure notifications to the dataset owner

Email these users when the refresh fails

Aasawari Ghatge X Enter email addresses

Apply Discard

10. To see the data refresh history, click on “Refresh History” link that appears on the same page.



11. On the “Refresh History” screen, you’ll see a log of data refreshes along with the refresh statuses.

Refresh history

Scheduled OneDrive

Details	Type	Start	End	Status	Message
	On demand	12/17/2019, 5:02:20 PM	12/17/2019, 5:02:26 PM	Completed	
	On demand	12/10/2019, 6:10:23 PM	12/10/2019, 6:10:34 PM	Completed	
	On demand	12/6/2019, 5:19:58 PM	12/6/2019, 5:20:02 PM	Completed	
	On demand	12/6/2019, 5:19:17 PM	12/6/2019, 5:19:23 PM	Completed	
	On demand	12/3/2019, 12:52:12 PM	12/3/2019, 12:52:18 PM	Completed	

Grant Access to Objects

In an early lab, we saw how to allow access to someone else at a workspace level now we’ll see how to grant access at object level (reports or dashboards). Follow the below mentioned steps to allow access to someone else for a report / dashboard that we’ve created so far.

1. Login to your service account.
2. Navigate to the App workspace you created earlier. You should also be able to see a report (under the “Report” tab) that you might have published in the previous lab.
3. Click on the “Share” icon next to the report name.



4. On the “Share report” window, search and select another user (within your organization) to whom you’d like to grant access to this report.

5. Uncheck all the three checkboxes at the bottom of the screen as we don't want the user to be able to reshare this report or create new report out of the underlying dataset.

Share dashboard
HEALTHCARE ANALYSIS DASHBOARD

Share Access

Grant access to

in

Jani Naraindas jnaraindas@nicesoftwareolutions.com

Include an optional message...

☐ Allow recipients to share your dashboard

☐ Allow users to build new content using the underlying datasets

☐ Send email notification to recipients

Share Cancel

6. Click on share.
7. To view and manage the permission that you've granted to the user on this report,
 - a. Navigate to the "Datasets" tab.
 - b. Click on the "More options" (ellipsis) icon that's appearing next to the dataset name and select "Manage permissions".

Dashboards Reports Workbooks Datasets Dataflows						
NAME ↑	ENDORSEMENT	ACTIONS	REFRESHED	NEXT REFRESH	API ACCESS	
Healthcare Dashboard for Web			12/14/2019,	N/A	--	

- c. In the "Manage permissions" screen, you should see the list of users who have access to the report.

d. You should also see the level of permission granted to each one of the users.

USERS AND GROUPS WITH ACCESS	EMAIL ADDRESS	PERMISSIONS
☒ Aasawari Ghatge	aghatge@nicesoftwareolutions.com	Admin (Owner)
☐ Sumit Gupta	sgupta@nicesoftwareolutions.com	Read, reshare, bu...
☐ Jani Naraindas	jnaraindas@nicesoftwareolutions.com	Read

e. If you wish to add a new user to this, you can search the username using the search box at the top.

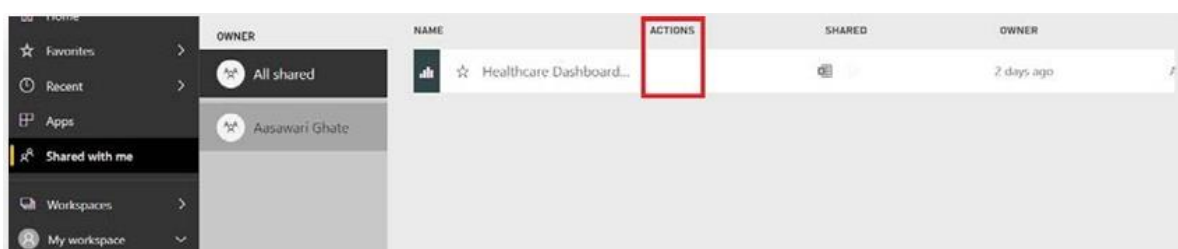
f. Similarly, to manage the access permission for a user, you can click on the “Permission options” (ellipsis) icon next to the username and select an appropriate permission option.

USERS AND GROUPS WITH ACCESS	EMAIL ADDRESS	PERMISSIONS
☐ Jani Naraindas	jnaraindas@nicesoftwareolutions.com	Read

Add reshare
 Add build
 Remove access

8. Ask your recipient to follow the below mentioned steps to see how it appears on his/her account.

- Login to the service account.
- Click on the section called as “Shared with me”. You should be able to see the report that has been shared with you.
- Observe that the “Actions” column would appear only with those set of access for which permission has been granted. In this case the column should appear as blank as we’ve not granted any permission apart from read.
- Clicking on the report would execute it and show you the output.



Configure RLS (Row Level Security)

So far in the some of the previous labs we've seen how to grant access to other users on workspace and object levels. However, using PowerBI you can also configure data level restrictions which is also called as Row Level Security (RLS). Let's take an example of a scenario where you have two different categories of nurses in your hospital,

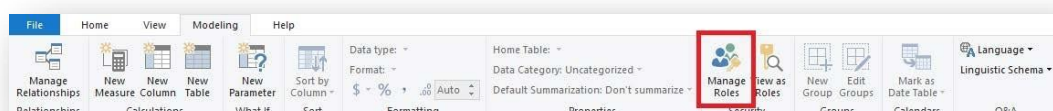
- One who should be able to access only OPD records.
- And the other one who should be able to access only IPD or

Emergency records. Following are high level configurations we need to do for implementing this restriction.

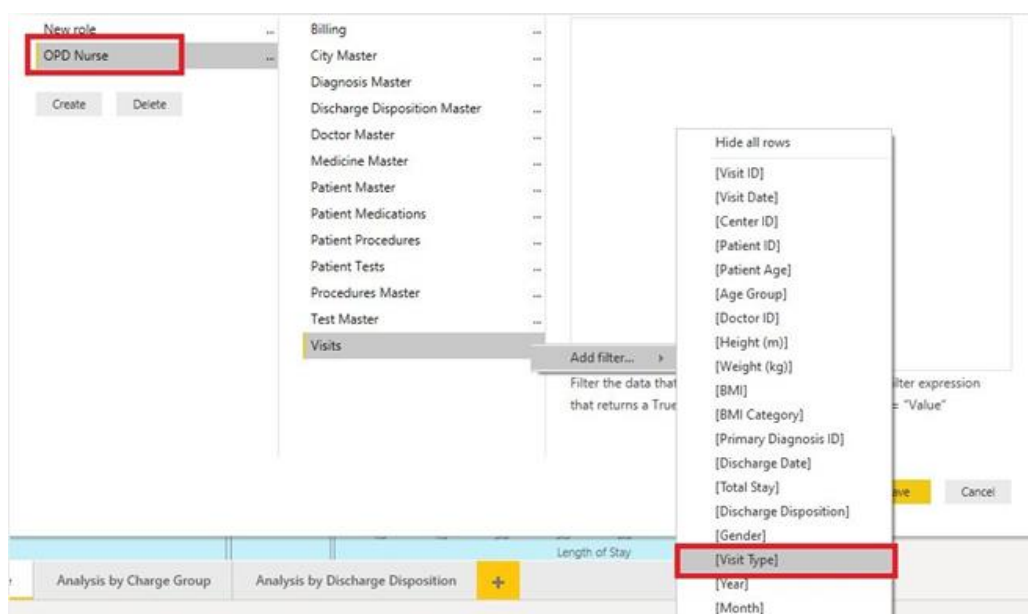
1. Create roles with a DAX function in PowerBI desktop.
2. Publish the report to PowerBI service account.
3. Assign users to each role.

Creating Roles

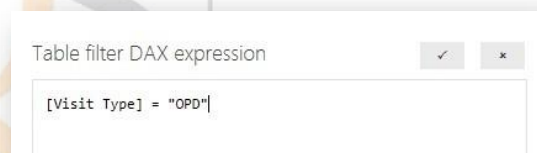
1. Open the PowerBI report you created in the previous labs.
2. Navigate to the "Modeling" menu and select "Manage Roles".



3. In the "Manage Roles" screen, click on "Create".
4. Name the role as "OPD Nurse".
5. From the "Tables" list, click on the ellipsis icon appearing next to the "Visits" table, go to "Add Filter" and select "VisitType".



6. Once you select the “Visit Type” column, the system would automatically create a DAX function “DAX Expression” box.
7. Amend the expression to, **[Visit Type] = "OPD"**. This will create the first role.



8. Click on “Create” again.
9. Name the new role as “IPD Nurse”.
10. From the “Tables” list, click on the ellipsis icon appearing next to the “Visits” table, go to “Add Filter” and select “VisitType”.
11. Once you select the “Visit Type” column, the system would automatically create a DAX function “DAX Expression” box.
12. Amend the expression to, **not([Visit Type] = "OPD")**. This will create the second role.

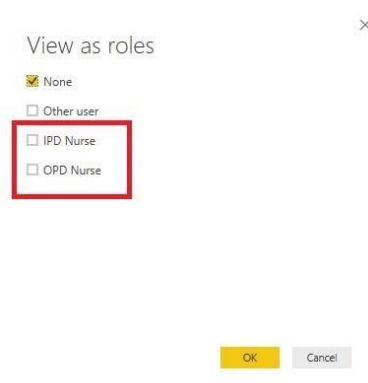
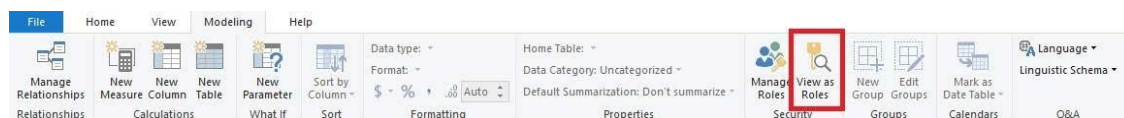


13. Click on "Save" to save both the roles.

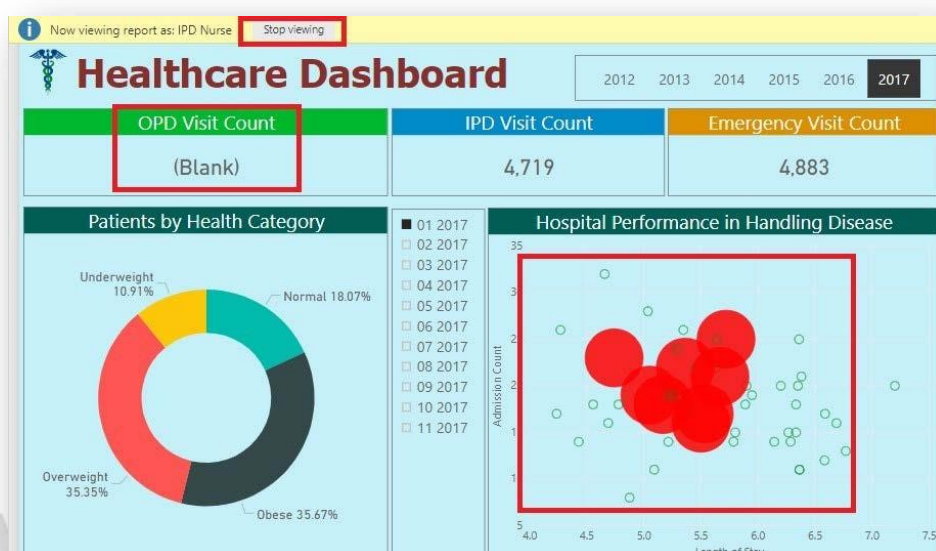
Role Impersonation

Once the roles are created you can check if they are operating properly. To run this test PowerBI offers a feature to impersonate the roles. Follow the below mentioned steps to run the impersonation.

1. Navigate to the "Modeling" tab and click on "View as Roles". This would bring up a window showing the list of roles you just created.



2. Check the “IPD Nurse” role and click on “Ok”.
3. You’ll now see that the data on your report would change to show only the IPD related information.



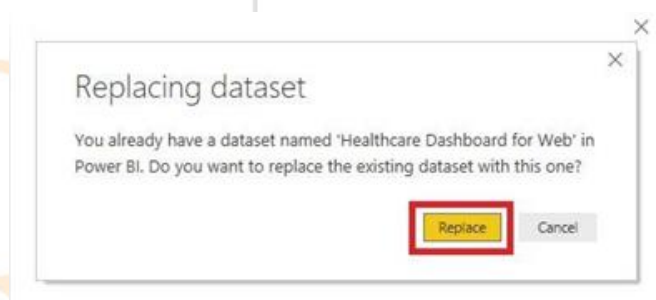
4. You can navigate to different pages of the report to view the amended data. To stop the role impersonation, just click on the “Stop Viewing” button appearing at the top yellow ribbon and the original report view would appear again.
5. Similarly, you can go back to the “View as Roles” screen and select “OPD Nurse” role to see another view of the report.

Publish Report to Service Account

Once you’ve checked and confirmed that the roles are working fine, go ahead and publish the report again to the serviceaccount. You may use the same App workspace where the report was published earlier.



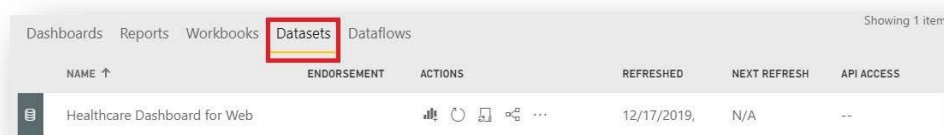
This would replace the earlier version of the report that was published to the service account with the new one. While publishing the report again, if the system prompts you to replace the existing dataset, go ahead and do so.



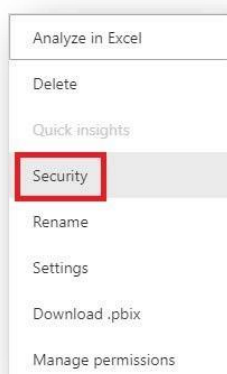
Note: Steps to publish a report has been already mentioned earlier.

Assign User(s) to Roles

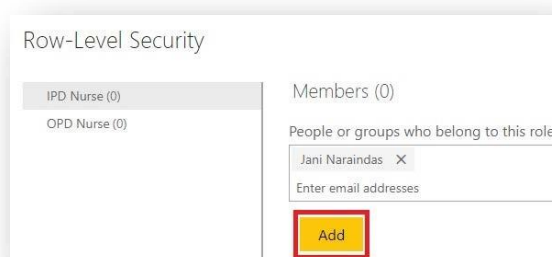
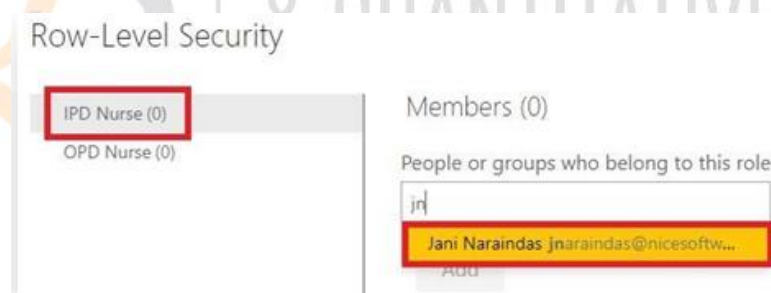
1. Once the report is re-published, login to the service account again using the URL mentioned below. <https://powerbi.microsoft.com/en-us/landing/signin/>
2. Navigate to the App workspace where you just published the report.
3. Click on the "Datasets" tab.



4. Click on the “More Options” (ellipsis) icon next to the dataset name and select “Security”.

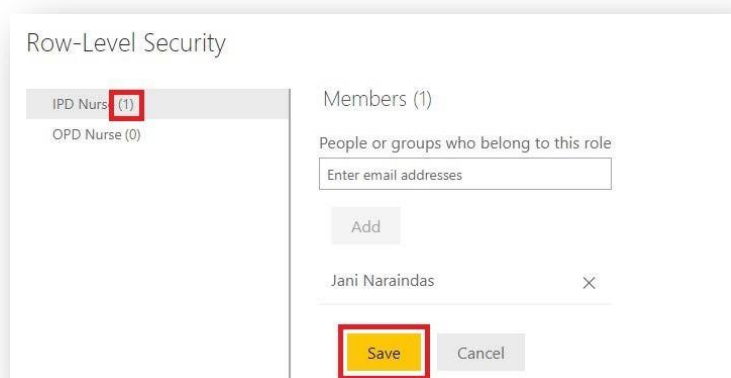


5. On the next screen, you'll see both the roles listed (the ones you created in PowerBI desktop). At this stage the number next to both the roles would appear as 0. This is because no user is assigned under them yet.
6. Select the “IPD Nurse” role and search for a username you'd like to assign under this role.
7. Select the username you searched and Click on “Add”.



8. After clicking on the “Add” button, the selected user would get assigned under “IPD” Nurse” role.

The number next to the role name would also change to 1.

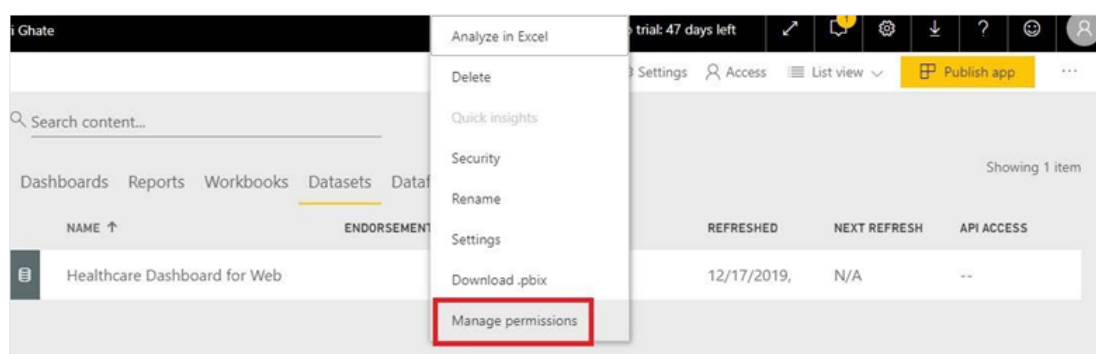


9. Click on “Save” to save the changes.

Share the Report

Once the user is assigned to the role, share report with the same user (if not done already). Follow the below mentioned steps, to check if the report is shared with the user (who has been assigned under a role).

1. Click on the App workspace again.
2. Navigate to the “Datasets” tab.
3. Click on the “More Options” (ellipsis) icon next to the dataset name and select “Manage Permissions”.



4. On the permissions screen, make sure the user is appearing in the list. It doesn't matter

what permission has been assigned to him as long as he is on the list.



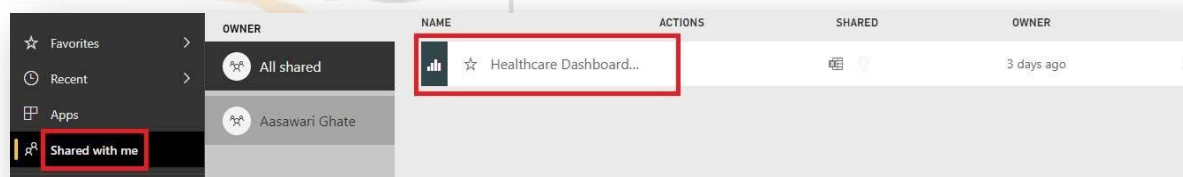
Search... Showing 3 recipient(s) Add user

☐	USERS AND GROUPS WITH ACCESS	EMAIL ADDRESS	PERMISSIONS
☒	Asawari Ghat	aghat@nicesoftwareolutions.com	Admin (Owner)
☐	Sumit Gupta	sgupta@nicesoftwareolutions.com	Read, reshare, bu...
☐	Jani Naraindas	jnaraindas@nicesoftwareolutions.com	Read, build

- If you have followed all the earlier labs properly, the name should be there in the list. However just in case it's not there, you can also use the search box (shown in the screenshot above) and search for the user with whom you want to share the report and click on "Add User".

Result Check

- Login to the service account as the user to whom the RLS has been applied (in this case it's jnaraindas@nicesoftwareolutions.com).
- Navigate to the "Shared with me" menu where you should see the list of reports shared by other users.



	OWNER	NAME	ACTIONS	SHARED	OWNER
☒	All shared	Healthcare Dashboard...			3 days ago
☐	Asawari Ghat				

- Click on the report name to execute it.
- You should be able to see the data restricted to IPD related information only.