



DMAP Docker Hub Installation Manual

Version 7.8

Date: February 24, 2023

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Contents

1. Introduction	3
2. DMAP Overview	3
3. Prerequisites	4
3.1 System Requirements.....	4
3.2 Prerequisites.....	4
4. Installation Procedure	5
4.1 Install Docker.....	5
4.2 Setting up DB Master & Worker Node Containers.....	6
4.2.1 DB Master Node Container Setup.....	6
4.2.2 DB Worker Node Container Setup.....	6
4.3 Setting up App Master & Worker Node Containers.....	7
5. Activating DMAP License	8
5.1 Registering DB Master Node Container.....	8
5.1.1 Login.....	8
5.1.2 Create Account.....	9
5.1.3 Activate License.....	10
5.1.4 Configure DB Master Node Container.....	11
5.2 Registering DB Worker Node Containers.....	12
6. Worker Node Setup	12
6.1 Worker Node Options.....	13
6.2 Resync Worker Node.....	14
6.3 Replace VM.....	14
6.4 Update Password.....	15
7. Troubleshooting	15
7.1 Unable to Log In to DMAP.....	15
7.2 DMAP Login Page is Not Displayed.....	16
8. Support	17

1. Introduction

DMAP is installed as a Docker image that can be downloaded from Docker Hub. This manual covers the installation procedure for configuring DMAP software on Docker container. This manual covers the installation procedure for configuring DMAP on Docker container running on Azure/AWS/on-premises VM or in user's workstation/laptop.

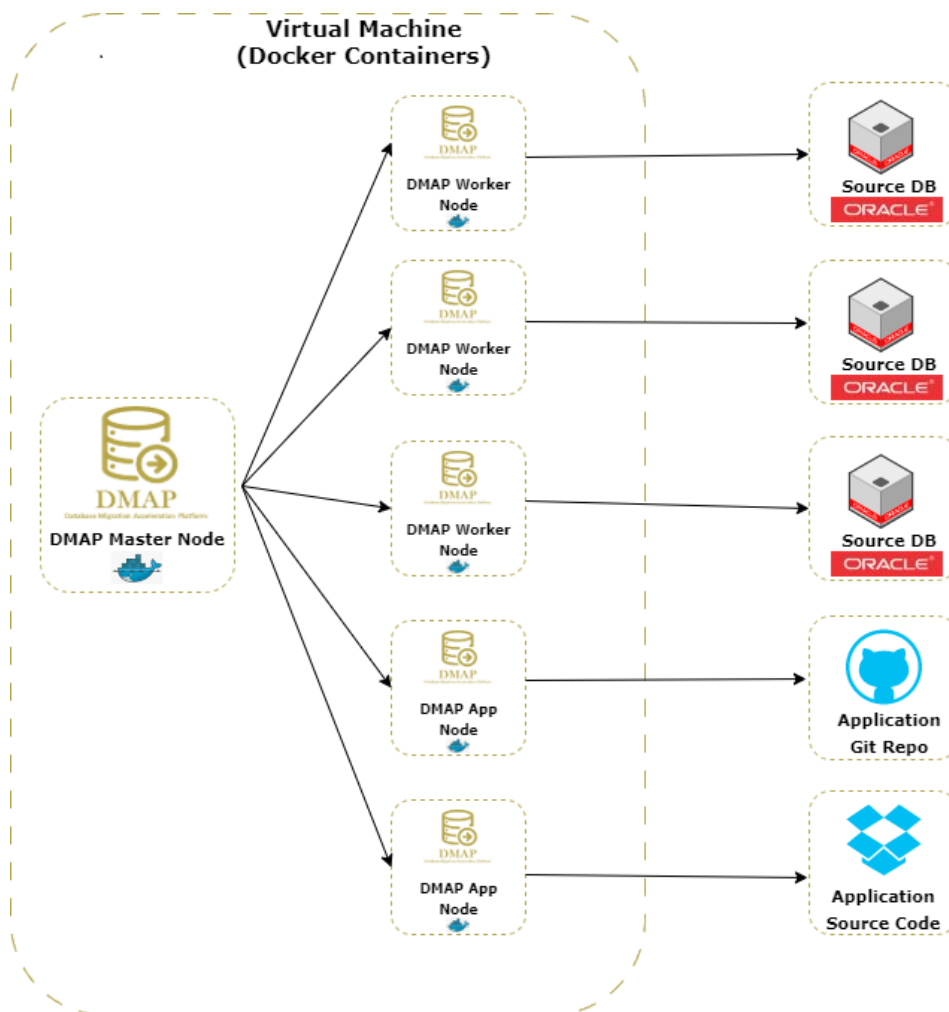
In this document VM refers to a cloud or on-premises server, VM or user's laptop on which DMAP can be installed.

2. DMAP Overview

DMAP will help you accelerate the database schema conversion process from Oracle to PostgreSQL through progressive automation of stored procedures, functions, SQL queries, business logic and custom schema constructs beyond the standard conversion tools provided by public cloud platforms.

Below is the Deployment Architecture of DMAP. DMAP is deployed as a Docker container from the image provided by Newt Global.

DMAP Deployment Architecture Diagram



Source Oracle DB and target PostgreSQL DB are configured in DMAP application to run the automated conversion.

If you wish to run DMAP for performing assessment and conversion of few schemas only, then you shall setup only DB Master Container node.

Optionally, to perform assessment at scale, multiple DB Worker Node containers can be setup each running a separate instance of DMAP to run assessments of multiple databases in parallel in a short time. Both Master and worker node containers can be setup on same or different VM hosts. Assessments and conversions performed in Worker Node are periodically synced backed to Master node and displayed in Database Migration Life Cycle dashboard on DMAP Master node.

Note: UI of DMAP is accessed through the URL of DB Master Container Node only. However, we need to register the DMAP license once for each DMAP DB Worker Node container by accessing its UI.

3. Prerequisites

3.1 System Requirements

- The following hardware configuration is required for host VM (on-premises or cloud) in which DMAP is installed:
 - 64-bit processor with Second Level Address Translation (SLAT)
 - **Recommended minimum system configuration:**
 - i. Minimum 16 GB of RAM and 1 vCPU for Windows 10 or above OS for 1st DMAP container
 - ii. Minimum 8 GB of RAM and 1 vCPU for Linux for 1st DMAP container
 - iii. For each DMAP Master or Worker Node container, add additional 8 GB of RAM and 1 vCPU
 - iv. 100 GB of free disk space in the main partition where DMAP is installed
 - BIOS-level hardware virtualization support must be enabled in the BIOS settings
 - For Windows platform, please install on Windows 10 or above and ensure that Hyper-V is enabled in Windows Features. You can search for “**Turn Windows features on or off**” in windows search box to enable it.

3.2 Prerequisites

- Make sure VM on which DMAP will be installed is connected to internet. Below URL should be whitelisted and accessible from the Docker Container in which DMAP will be installed.
 - Access to Docker Hub and permission to PULL images
 - URL to download the DMAP backend and GUI services updates after DMAP container is started

Azure: <https://msmkdmapdisks.blob.core.windows.net/>

- Licensing server which DMAP connects to check if user is authorized to run Assessment and Conversion

<https://api.cryptlex.com/v3>

- Use Google Chrome browser to access DMAP User Interface from DB Master Node container
- Read Only Access to Oracle Schemas to run Discovery and Assessment
- Oracle databases to be accessed shall be accessible from the VM in which DMAP is installed
- Read/Write Access to target PostgreSQL DB if user wants to run schema conversion to migrate schema from Oracle to PostgreSQL

4. Installation Procedure

If you wish to run DMAP for performing assessment and conversion of few schemas only, then you shall setup only DB Master Node container.

Optionally, to perform assessment at scale, multiple DB Worker Node containers can be setup each running a separate instance of DMAP to run assessments of multiple databases in parallel in a short time. Both Master and worker node containers can be setup on same or different VMs. Since DMAP uses docker based containers, Docker has to be installed on each VM.

Follow below installation procedure to complete installation of DMAP.

4.1 Install Docker

- Download docker software from docker official website (based on your operating system) mentioned below and install it, if not installed already.

<https://docs.docker.com/engine/install/>

- For RHEL and CentOS, follow installation steps given in page <https://docs.docker.com/engine/install/centos/>

- For Ubuntu OS, follow installation steps given in page <https://docs.docker.com/engine/install/ubuntu/>

- For Windows OS, follow the installation steps given in page <https://docs.docker.com/desktop/install/windows-install/> Run Docker up and running

- To pull the DMAP docker image for both DB and App migration, run the below command in terminal or command line.

- `docker pull ngdmapo/dmap_azure_blob_prod:latest`

- `docker pull ngdmapo/dmap_app_migration_azure_blob_prod:latest`

- To check the images are pulled from docker hub, run the below command. Below command will give the list of all the downloaded images.

- `docker images`

4.2 Setting up DB Master & Worker Node Containers

4.2.1 DB Master Node Container Setup

- To create the master container from DMAP image for the first time, use the below command.

- `docker run -d -it -p {DB_PORT}:5432 -p {UI_PORT}:8080 -p {PYTHON_SERVICE_PORT}:5002 -e UI_PORT={UI_PORT} -e SERVICE_PORT={PYTHON_SERVICE_PORT} -e DB_PORT={DB_PORT} --name=dmap_db_master ngdmapo/dmap_azure_blob_prod:latest`

- To create the master container, following sample command can be used:

```
docker run -d -it -p 5432:5432 -p 9090:8080 -p 5002:5002 -e
UI_PORT=9090 -e SERVICE_PORT=5002 -e DB_PORT=5432 --
name=dmap_db_master ngdmapo/dmap_azure_blob_prod:latest
```

- Please make sure:

- UI_PORT, PYTHON_SERVICE_PORT, and DB_PORT can be any port. Make sure PORT highlighted in same colour have same port number.
- Make sure port numbers used are available and not used by any other process or DMAP container running in the VM in which DMAP is installed.

- To start the DMAP Master and Worker Node containers, execute following command:

- `docker start [Master or Worker Node container instance name]`

- To stop the DMAP Master or Worker Node containers, execute following command:

- `docker stop [Master or Worker Node container instance name]`

4.2.2 DB Worker Node Container Setup

- Follow same steps as mentioned in “**DB Master Node Container Setup**” but make sure for each container UI_PORT, PYTHON_SERVICE_PORT, and DB_PORT is unique if they are setup in the same VM.
- Worker containers can be created in same or different VMs. If they are created in different VMs, they can use same port numbers otherwise port numbers have to be unique on each machine.
- To create each DB worker container in a separate VM, following sample commands can be used. Here, we are setting up two worker containers as an example.

```
docker run -d -it -p 5433:5432 -p 9093:8080 -p 5003:5002 -e UI_PORT=9093 -e
SERVICE_PORT=5003 -e DB_PORT=5433 --name=dmap_db_worker1
ngdmapo/dmap_azure_blob_prod:latest
```

```
docker run -d -it -p 5433:5432 -p 9093:8080 -p 5003:5002 -e UI_PORT=9093 -e
SERVICE_PORT=5003 -e DB_PORT=5433 --name=dmap_db_worker2
ngdmapo/dmap_azure_blob_prod:latest
```

- To create DB worker containers in same VM, following sample commands can be used. Here, we are setting up two worker containers as an example.

```
docker run -d -it -p 5433:5432 -p 9093:8080 -p 5003:5002 -e UI_PORT=9093 -e
SERVICE_PORT=5003 -e DB_PORT=5433 --name=dmap_db_worker1
ngdmapo/dmap_azure_blob_prod:latest
```

```
docker run -d -it -p 5434:5432 -p 9094:8080 -p 5004:5002 -e UI_PORT=9094 -e
SERVICE_PORT=5004 -e DB_PORT=5434 --name=dmap_db_worker2
ngdmapo/dmap_azure_blob_prod:latest
```

4.3 Setting up App Master & Worker Node Containers

- Similar to DB Master and Worker Node containers setup explained above, to run application assessment and conversion using DMAP, App Master and Worker Node containers can be setup.
- To create a container using DMAP App Migration image for the first time, run the below command.

- **docker run -d -it -p {JAVA_SERVICE_PORT}:8080 -p {APP_PORT}:5000 --name=dmap_app ngdmapo/dmap_app_migration_azure_blob:latest**

- To create container, following sample command can be used:

```
docker run -d -it -p 8090:8080 -p 5020:5000 --name=dmap_app
ngdmapo/dmap_app_migration_azure_blob_prod:latest
```

- **Note:**

- JAVA_SERVICE_PORT and APP_PORT can be any port.
- Make sure port numbers used are available and not used by any other process or DMAP container in the VM.
- Container name i.e. dmap_app in above example shall be replaced with actual master or worker container name

- To start the DMAP App container if it is not already running, execute following command:

- `docker start [Master or Worker Node container instance name]`

- To stop the DMAP App container, execute following command
 - `docker stop [Master or Worker Node container instance name]`

5. Activating DMAP License

5.1 Registering DB Master Node Container

When DMAP container is started, it will download fresh binary files for GUI and backend services updates for the first time. In subsequent runs, it checks if a newer version is available and downloads it from Azure BLOB storage. So, depending upon speed of your internet, please wait for 5 – 15 minutes for DMAP to download these files and then proceed to next step to open the login page. While binaries are downloading, login page will not be accessible.

Make sure below ports are open for access in the VM in which DMAP DB / App containers are installed:

- UI_PORT for DB Container
- PYTHON_SERVICE PORT for DB Container
- APP_PORT for App Container

Note: UI of DMAP is accessed through the URL of DB Master Node container

only. However, we need to register the DMAP license once for each DMAP DB Worker Node container by accessing its UI.

Once Master and Worker Node containers setup is complete. Follow below steps to access DMAP.

5.1.1 Login

Open Google Chrome web browser in DMAP VM or in a different machine. DB Master Node container hosting DMAP should be accessible from the VM/Machine. Next, enter below URL in web browser to access DMAP using UI Port of DB Master Node container.

`http://{DB_Master_Node_VM_IP}:{UI_PORT}/DMAP`

DB_Master_Node_VM_IP is IP address of VM hosting DB Master Node container.

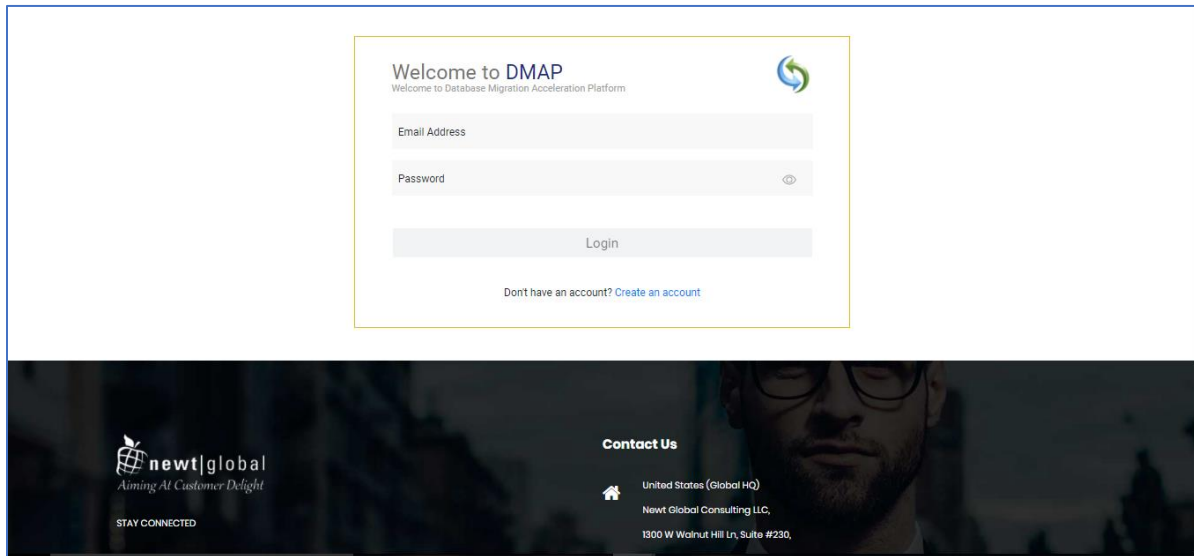
UI_PORT is UI Port setup for DB Master Node container.

If DMAP DB Master container is running on IP 192.168.12.10 at port 9090 then URL will be

<http://192.168.12.10:9090/DMAP>

Note: DMAP in URL shall be typed in upper case.

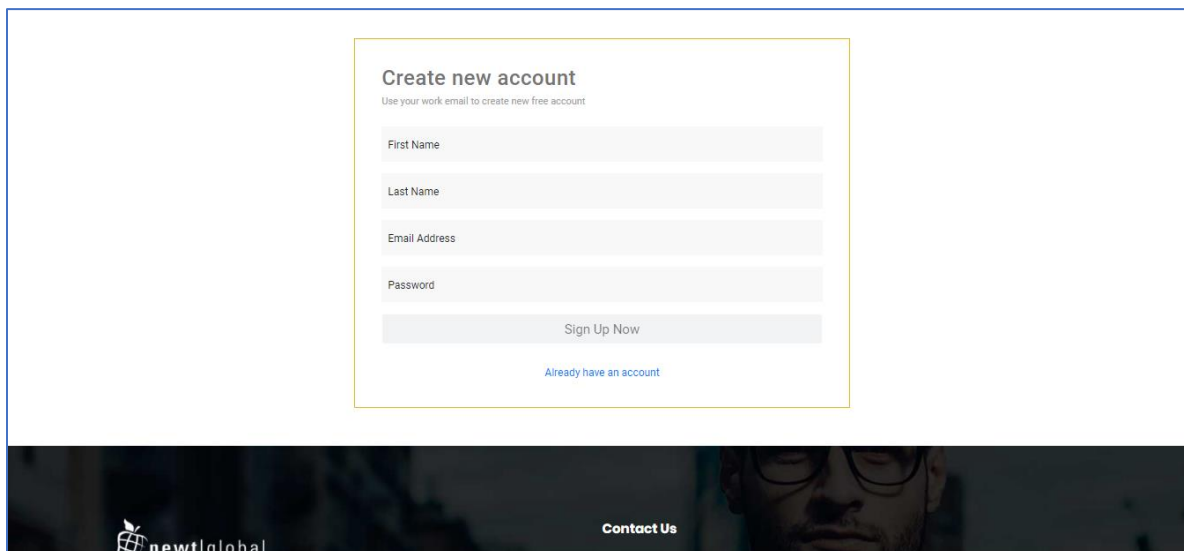
Enter username and password to login. If you do not have username and password setup yet, then follow next step to create user account.



The screenshot shows the DMAP login interface. At the top, it says "Welcome to DMAP" and "Welcome to Database Migration Acceleration Platform". Below this are two input fields: "Email Address" and "Password". A "Login" button is positioned below the password field. At the bottom of the form area, there is a link that says "Dont have an account? Create an account". The footer of the page includes the newt|global logo, the tagline "Aiming At Customer Delight", and the text "STAY CONNECTED". On the right side of the footer, there is a "Contact Us" section with a home icon and the following text: "United States (Global HQ)", "Newt Global Consulting LLC,", and "1300 W Walnut Hill Ln, Suite #230,".

5.1.2 Create Account

First time user is required to create a new account by clicking **“Create an account”** link on the Login page. Only one user account is allowed per DMAP Master Node container. For additional users (if license permits), please install and setup a separate instance of DMAP Master and Worker Node containers.



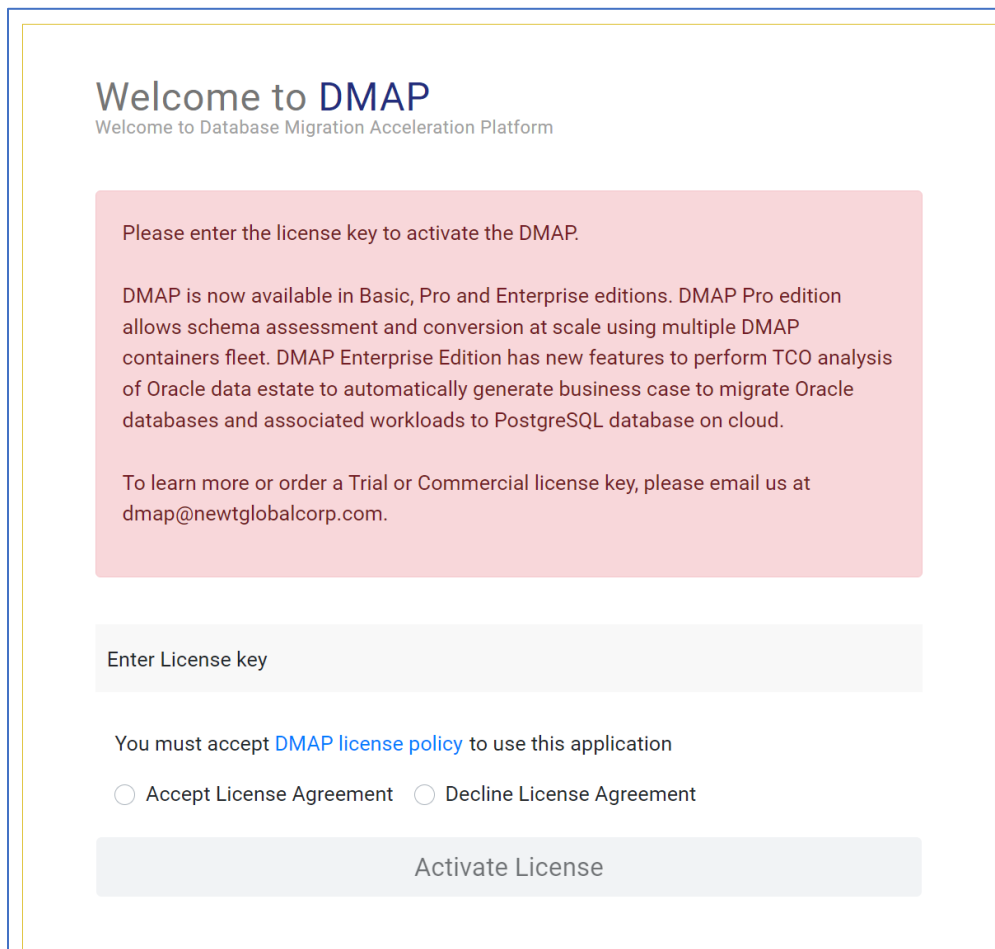
The screenshot shows the "Create new account" page. The title is "Create new account" with a subtitle "Use your work email to create new free account". Below this are four input fields: "First Name", "Last Name", "Email Address", and "Password". A "Sign Up Now" button is located below the password field. At the bottom of the form area, there is a link that says "Already have an account". The footer of the page is identical to the login page, featuring the newt|global logo, tagline, and contact information.

After signing up, enter the email id in the **“Email Address”** and password in the **“Password”** text box of login page. Ensure that email id is entered in a valid email format and click on **“Login”** button.

After successful login, user will be directing to buy license page. To buy a license or renew the license, you must contact DMAP sales team. DMAP sales team details will be shown on the license activation page. **Or alternatively you can enter the license key of Trial license of DMAP if you have one.**

5.1.3 Activate License

To activate DMAP license, enter License key and accept the License Agreement.



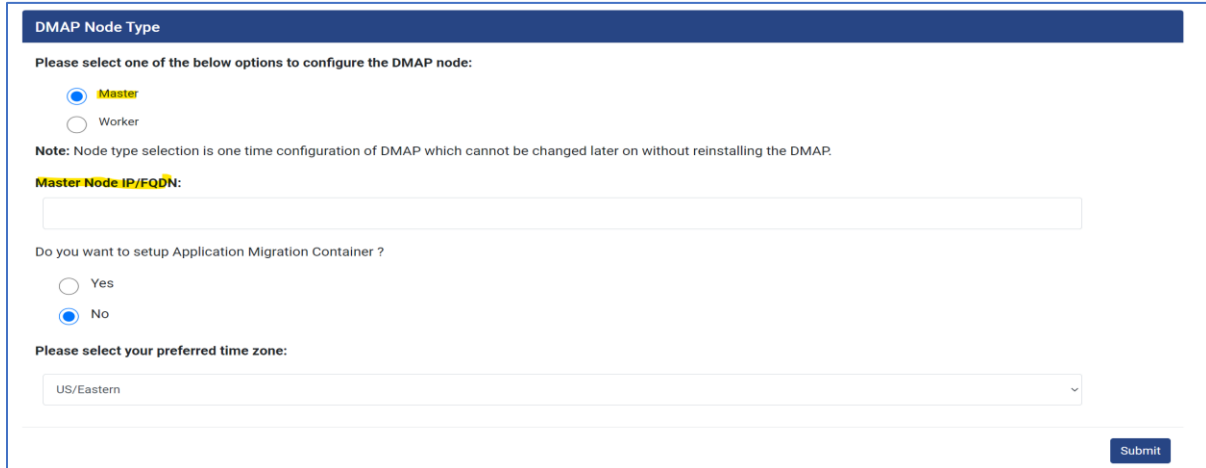
The screenshot shows a web interface for activating a DMAP license. At the top, it says "Welcome to DMAP" and "Welcome to Database Migration Acceleration Platform". Below this is a pink box containing instructions: "Please enter the license key to activate the DMAP." It also lists the available editions: Basic, Pro, and Enterprise. The Pro edition allows schema assessment and conversion at scale using multiple DMAP containers fleet. The Enterprise Edition has new features for TCO analysis of Oracle data estate to automatically generate business case to migrate Oracle databases and associated workloads to PostgreSQL database on cloud. It also provides an email address: dmap@newtglobalcorp.com. Below the pink box is a text input field labeled "Enter License key". Underneath is a statement: "You must accept DMAP license policy to use this application". There are two radio buttons: "Accept License Agreement" (selected) and "Decline License Agreement". At the bottom is a large button labeled "Activate License".

Note: Trial or Commercial license will be shared and explained separately by sales team. You can reach out to Sales team through email (dmap@newtglobalcorp.com) or by visiting our website (<https://newtglobal.com/platform-enquiry>) to submit DMAP enquiry with your request.

Next, click on **Activate License** button which will direct you to **Get Started with Migration Page**. To use DMAP, please refer to the User Guide provided to you.

5.1.4 Configure DB Master Node Container

After DMAP license is activated successfully, user will see “**DMAP Node Type Selection**” screen. Select “**Master**” to setup DMAP DB Master Node container.



Note: Based on license type settings screen will differ.

- For “**DMAP Basic**” license, only time zone selection will be required. All reports and screens will display date in the selected time zone.
- For “**DMAP Pro**” and “**DMAP Enterprise**” license:
 - Select the DMAP DB Node container being activated as “**Master**” or “**Worker**”. Multiple worker nodes can be setup if you wish to perform data centre assessment of schemas at scale. In this mode, DB Master Node container distributes schemas to be accessed across multiple DB Worker Node containers. **Only one container will be configured as Master** which collects assessment results from individual worker node containers and displays assessment summary in DB Master Node container. Master node container can also function as worker node container and can also run schema assessments and conversions.
 - **To perform assessment at scale, configure one DMAP DB Node container as “Master” and remaining as “Worker”. If you wish to run DMAP for performing assessment and conversion of few schemas only, then select “Master” node option.**
 - if you select node type as “**Master**” node, then enter master node VM IP address in “Master Node IP/ FQDN” text field.
 - Finally, select the preferred time zone for displaying time in reports and screens.

5.2 Registering DB Worker Node Containers

To register and activate license for each DB Worker Node container, follow same steps as described in “**Registering DB Master Node Container**” section with below considerations:

- Use below link to access the login page for Worker Node container.

http://{DB_Worker_Node_VM_IP}:{UI_PORT}/DMAP

- Create user account and activate the DMAP using your license key. In “**DMAP Node Type Selection**” screen shown below, select “**Worker**” node option.

DMAP Node Type

Please select one of the below options to configure the DMAP node:

Master
 Worker

Note: Node type selection is one time configuration of DMAP which cannot be changed later on without reinstalling the DMAP.

Please select your preferred time zone:



US/Eastern

[Submit](#)

- Once license has been activated, there is no need to access DMAP Worker Node container UI because we use DMAP DB Master Node container UI to assess schemas.

6. Worker Node Setup

In “**Worker Node Setup**” tab, you can configure DB Worker node containers.


DMAP
Welcome dmap@newtglobal.com
Logout


Database Migration Acceleration Platform (DMAP)

[Get Started with Migration](#)
[Analytics Dashboard](#)
Worker Node Setup
[Existing Migrations](#)
[App & DB Details](#)

[Add Worker Node](#)

Worker Node IP	Worker Node URL	Node Name	Status	Action
localhost	http://localhost:8080/DMAP	VM0	Live	

Note: DB Master Node container will also work as worker node and will be displayed with Node Name as “**VM0**”. Master node will have only option to “**Resync**”.

Click on “**Add Worker Node**” to add worker node. Fill all the required fields. Click on “**Test Connection**” to verify if you can connect to the worker node.

Add Worker Node ✕

Worker Node IP/FQDN *

Worker Node Service Port *

Worker Node UI Port *

Worker Node Username *

Password *

Click on **“Submit”** to configure a worker node. On clicking on submit button, you will get confirmation dialogue box as shown below.

Confirmation ✕

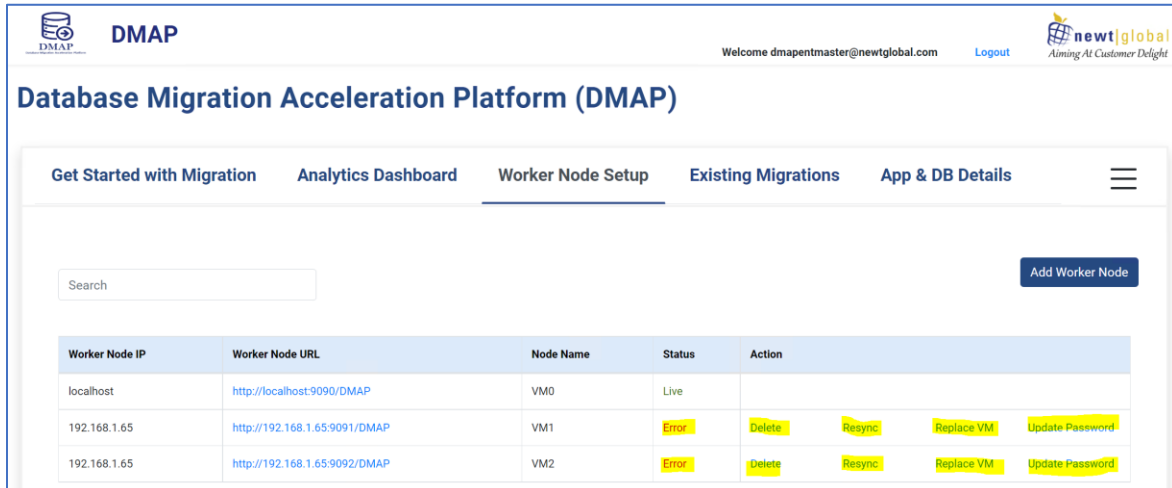
If a new worker node is added for DMAP analytics assessment, then any prior schema assessments or conversions done on that node are cleared. Do you want to add this node?

Note: If a new worker node is added for DMAP analytics assessment, then any prior schema assessments or conversions done on that node are cleared.

Worker Node Configuration Details			
Field Name	Type	Values to be Entered	Mandatory
Worker Node IP/FQDN	Text Box	Host address (either IP address or the host URL or hostname) of worker node	Yes
Worker Node Service Port	Text Box	Worker node service port number (e.g, 5200)	Yes
Worker Node UI Port	Text Box	Worker node UI port number (e.g, 8080)	Yes
Worker Node Username	Text Box	Worker node DMAP username	Yes
Password	Text Box	Worker node DMAP password	Yes

6.1 Worker Node Options

You can perform below highlighted operations on inactive worker node.



Worker Node IP	Worker Node URL	Node Name	Status	Action
localhost	http://localhost:9090/DMAP	VM0	Live	
192.168.1.65	http://192.168.1.65:9091/DMAP	VM1	Error	Delete Resync Replace VM Update Password
192.168.1.65	http://192.168.1.65:9092/DMAP	VM2	Error	Delete Resync Replace VM Update Password

Delete Worker Node

You can delete worker node on clicking **“Delete”**. Deleting a worker node will remove all database assessments performed on the node which cannot be recovered later.

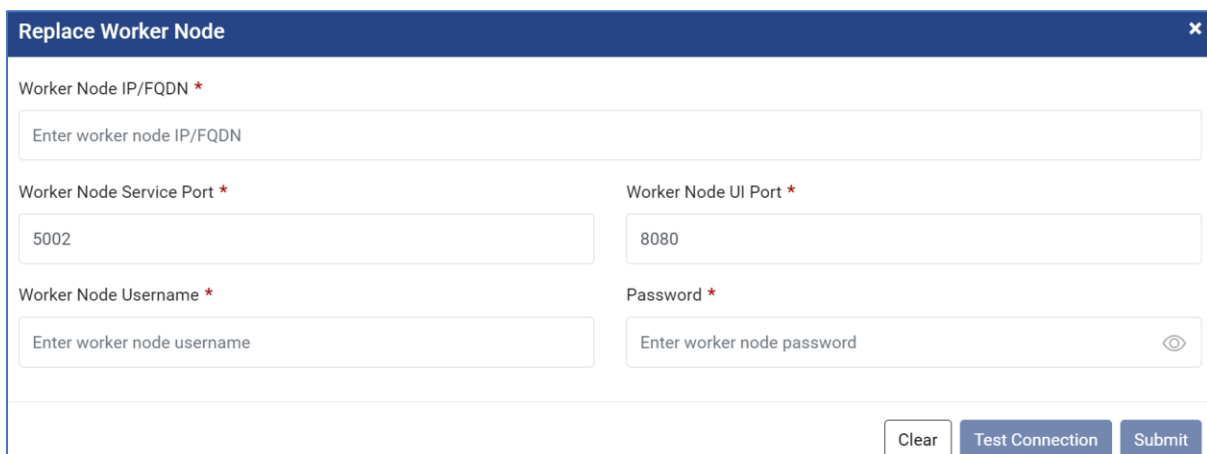
6.2 Resync Worker Node

If worker node container is not reachable from master node, then status will show as **“Error”**. Once the worker node container connectivity issue has been resolved, you can click on **“Resync”** to verify that DMAP can connect to the worker node. If connection is successful, then status would change to **“Live”**.

6.3 Replace VM

You can replace inactive worker node with a new active worker node. Clicking on **“Replace VM”**, you will get a popup screen to configure new worker node details just like add worker node.

This action will restore most recent worker node backup (which is automatically taken by DMAP Master node periodically) which will be replaced in the new worker node.



Replace Worker Node

Worker Node IP/FQDN *

Enter worker node IP/FQDN

Worker Node Service Port *

5002

Worker Node UI Port *

8080

Worker Node Username *

Enter worker node username

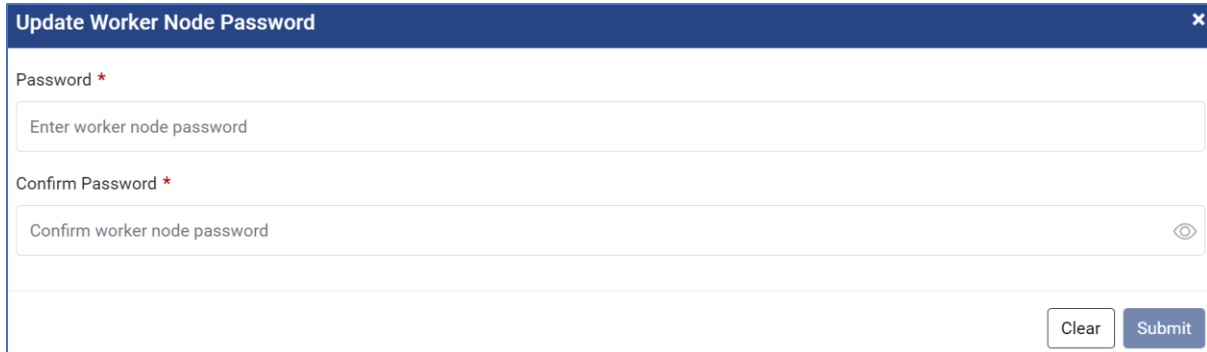
Password *

Enter worker node password

Clear Test Connection Submit

6.4 Update Password

If worker node DMAP password was changed, you can update password on selecting “**Update Password**” as shown in screenshot.



Update Worker Node Password

Password *

Enter worker node password

Confirm Password *

Confirm worker node password

Clear Submit

7. Troubleshooting

Below are some tips that may help the user to troubleshoot and resolve common errors.

If the user faces any issues in configuring DMAP, please contact **Newt DMAP Support Group** dmap_support@newtglobalcorp.com

7.1 Unable to Log In to DMAP

- I. Verify that log in request from workstation used to access DMAP web app can reach the Virtual Machine and correctly show its IP address in request header.
- II. On Login Page, “**Login**” button is disabled if email address is not entered in a valid email format. So, make sure email address is valid and then click on Login button.
- III. Login inside container and check following required services are running properly.
 - a. Postgres DB
 - b. GUI (Tomcat)
 - c. Backend (Service)
- IV. To check running services list in docker container
 - a. Launch container shell either using docker command “*docker exec -it --user=root <<your_container_name>> bash*” in terminal or using Docker Desktop (Windows only) dashboard.
 - b. Inside the shell, execute command “**ps -aux**” as mentioned below.

```
[root@e83717ca6a19 tomcat]# ps -aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
postgres  1  0.0  0.5 105512 23964 pts/0    Ss+  11:08   0:01 /usr/bin/python3.6 /usr/local/bin/supervisord -c /etc/supervisor.conf
postgres 10  0.0  0.0  14884  3156 pts/0    S    11:08   0:00 /bin/bash ./run_backend.sh
postgres 12  0.0  0.0  14884  3244 pts/0    S    11:08   0:00 /bin/bash ./run_ui.sh
postgres 13  0.0  0.0   8636   900 pts/0    S    11:08   0:00 ./Service
postgres 14  0.2  2.7 653192 111396 pts/0    Sl   11:08   0:18 ./Service
postgres 15  0.1  4.2 3461016 173408 pts/0    Sl   11:08   0:13 /usr/bin/java -Djava.util.logging.config.file=/usr/local/tomcat/conf/logging.properties -Djava.util.logging.manager
root      88  0.0  0.1  15280  4244 pts/1    Ss+  11:08   0:00 bash
postgres 148  0.0  0.5 286592 24188 pts/0    S    11:08   0:00 /usr/pgsql-11/bin/postgres
postgres 149  0.0  0.0  139388  3936 ?        Ss   11:08   0:00 postgres: logger
postgres 151  0.0  0.2 286724  8456 ?        Ss   11:08   0:00 postgres: checkpointer
postgres 152  0.0  0.1 286592  6728 ?        Ss   11:08   0:00 postgres: background writer
postgres 153  0.0  0.2 286592  9260 ?        Ss   11:08   0:00 postgres: walwriter
postgres 154  0.0  0.1 287024  6632 ?        Ss   11:08   0:00 postgres: autovacuum launcher
postgres 155  0.0  0.0 141508  3948 ?        Ss   11:08   0:00 postgres: stats collector
postgres 156  0.0  0.1 286880  6628 ?        Ss   11:08   0:00 postgres: logical replication launcher
root      3952 2.8  0.1  15280  4260 pts/2    Ss   13:12   0:00 bash
root      3984 0.0  0.0  50536  3884 pts/2    R+   13:12   0:00 ps -aux
[root@e83717ca6a19 tomcat]#
```

- c. **“./Service”** – confirms DMAP backend service is started and listening to client request.
 - d. **“/usr/bin/java -Djava.util.logging.config.file=/usr/local/tomcat/conf/logging.properties -Djava.util.logging.manager”** – confirms DMAP GUI service is started and running for user to access DMAP UI from the chrome browser.
 - e. **“/usr/pgsql-11/bin/postgres”** and related services as highlighted in the image confirms that PostgreSQL has started and running.
- V. If any of the above required services are not running, try restarting the container once. If issue still persists, follow below steps:
- a. To start Postgres service, execute **“pg_ctl stop”** command followed by run **“pg_ctl start”** command. If service is still not started, get Process ID by running command **“pg_ctl status”** and then using the returned PID, kill the process using command **“kill -9 <<PID>>”**
 - b. To start GUI service, execute **“catalina.sh run”** command.
 - c. To start Backend services, change directory to **“cd /usr/local/tomcat/Service”** and followed by run **“./Service”**.

7.2 DMAP Login Page is Not Displayed

- I. If you are accessing the Master DB Node container UI from a browser running in a different VM, then make sure that UI and Service ports for DMAP are open for access.
- II. Make sure DMAP is typed in upper case in the URL below:
http://{DB_Master_Node_VM_IP}:{UI_PORT}/DMAP
- III. Whenever DMAP container is started (including first time), it checks if a new update is available and downloads it from Azure BLOB. This may take 5 – 15

minutes depending on speed of your internet. Please wait for DMAP to download the update and access login page after some time.

8. Support

For immediate assistance, please contact us on dmap_support@newtglobalcorp.com ; one of our technical team members will provide you the necessary support.