# Teradata® Data Transfer Utility

## User Guide

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# Contents

# Data Transfer Utility

Data Transfer Utility (DTU) is a follow on to the previous NPARC product. DTU uses DSA technology as the back end to provide an easy way to migrate data from Teradata Database 15.10 (minimum version: 15.10.07.61) or Advanced SQL Engine 16.20 (minimum version: 16.20.43.01) to Advanced SQL Engine 16.20 (minimum version: 16.20.43.01) or Advanced SQL Engine 17.00 or later.

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**Note:**

- Teradata Database 16.00 and 16.10 are not supported.
- If the target database is Advanced SQL Engine 17.00 or later, then PUTTools version must be 02.02.00.10 or later.

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DTU provides migration both for on-premises to on-premises and for on-premises to cloud configurations. It provides the following capabilities.

- Pre-migration assessment and a downloadable report on system readiness for migration
- Offline system migration: No other operations are allowed on source and target systems while the migration is in process
- Automated error detection with suggested recovery actions
  - System restarts or intermittent network failures: Can recover and continue with migration
  - Migrations failures: Can analyze and provide steps to recover. Manually apply steps and resume migration.
- Post-migration validation
- Comprehensive summary report

## Dependencies

The Data Transfer Utility is hosted on a Docker VM and contains the following microservices and software components:

- Pre-migration Setup (PMS): Configures source and target system with DSC, generates job plan for migration, and supports creation of DTU jobs.
- Pre-migration Assessment Service (PMA): Assesses source, target and DSC machine for any migration blocker issues and estimates the time for data migration.
- Migration Service (MIG): Creates DSA jobs and migrates data from source system to target system.
- Post-migration Validation (PMV): Validates the data migrated from source system to target system.
- Error Detector Service (EDS): Monitors logs of all software components during data migration and consolidates software states in case of errors, hangs, slowness and software failures.

    - Filebeat: Streams logs of all the software components involved during migration from source, target, and DSC machines to error detector service.
    - Logstash: Filters the log streams before error detector service pick for processing.
    - Kafka: Acts as a messaging queue between Logstash and error detector service to transfer logs.
- Root Cause Analysis Service (RCA): Analyzes cause of the problem in case of errors, hangs, slowness and software failures and suggests remedy to resolve the issue.

The other components and systems require the following:

| Installed | Source | Target | DSC |
|---|---|---|---|
| Teradata System | Teradata Database*<br>• minimum: 15.10.07.61<br>• minimum: 16.20.43.01 | Advanced SQL Engine*<br>• minimum: 16.20.43.01<br>• 17.00.00 or later | |
| DSC System | | | 17.05.00.00 |
| TPA REST | all nodes | all nodes | all nodes |
| PUT Tools | all nodes | all nodes | |
| Teradata JDK | | | X |
| ClientHandler (BAR NC) | | all nodes | |
| BAR CLI | | | X |
| ActiveMQ | | | X |
| Filebeat | all nodes | all nodes | all nodes |
| *Teradata Database 16.00 and 16.10 are not supported. | | | |

# Recommendations and Limitations for DTU

## Recommendations

Teradata recommends using Chrome for DTU and setting the zoom to 75%.

## Limitations and Restrictions

- [On-premises to Cloud] Bandwidth information is determined during deployment. If DTU cannot determine the bandwidth, it will default to 1 Gbps.
- [On-premises to Cloud] To collect logs, you must open a ticket with the Cloud L2 team to run the script that collects the logs. The script must be run from the controller node. Access to the controller node is using a `.pem` file, which cannot be shared due to Teradata security standards.
- If the source has secure zones, the migration skips them. They do not migrate to the target system.
- If migration fails during the process, follow the instructions under ABORTed.

- If migration is in HALT state, you can resume the migration after applying the remedy suggested by the RCA and the items listed under ABORT.
- If migration is ABORTed, the following must occur before restarting the migration:
  - Run SYSINIT and DIPMIG on the target system.
  - If fabric is used, reconfigure DSC on the target system.
  - If fabric is used and a source or target node goes down during migration, reconfigure the DSC on the respective source or target system.
  - To rerun the PreMigration Assessment, enable logon all on the target system.
- If fabric is used and any source node goes down during migration, the source system must be reconfigured with DSC.
- If fabric is used and any target node goes down during migration, the target system must be reconfigured with DSC.
- Password restrictions:
  - Maximum password length is 127 characters.
  - Alphanumeric plus @, #, $, %, ^, *, -, _, ?
  - Do not enclose in quotes or add escape sequences.

# Block Level Compression

While creating a DSA job, DTU sets the block compression query band to YES when the following is true for the dbscontrol compression flags on target:

- BlockLevelCompression = ON
- CompressPermPrimryDBs = UNLESSQB

The query band that is set is:

```
SET QUERY_BAND = 'BLOCKCOMPRESSION=YES;' FOR SESSION;
```

All tables on the target will be compressed with this query band, whether or not they are compressed on the source.

# Selective Migration

Beginning with DTU 1.2, you can incrementally migrate data over a period of time by using include lists of databases.

- The first migration must include the DBC and migrates all the dictionary data and databases in the include list.
- For subsequent migrations, you must select No for including the DBC and provide an include list of databases.
- If there are empty databases in the include list, they are removed from the list (empty databases are skipped during data migration).
- If all the databases in the include list are empty, the empty databases are migrated.

- If new tables are created in an existing database after it was migrated, simply include that database name on an include list for a subsequent migration.
- Do not create new databases on the source machine after migration has started. If a new database is created on the source machine after the DBC has been migrated, the following can occur if the database is placed on an include list.
  - If the same database name exists on the target system, the database ID matches, and the database is not empty, you receive a warning that the database content will be overwritten.
  - If the database does not exist on the target or it exists but the IDs don't match, a blocker issue is reported during assessment. You must remove this database name from the include list.

# Phone Call Notifications

Beginning with DTU 1.3, you can choose to receive automated voice calls in case of errors.

- Phone notification is enabled during deployment and configured in the UI.
- Outbound port 443 must be opened from the DTU VM.
- DTU initiates a phone call if one of the following occurs:
  - Migration halts due to error
  - DTU detects a hang
- You must configure both a primary and secondary contact.
  - If the primary contact does not answer, call is routed to secondary contact.
  - If the secondary contact does not answer, the call routes back to the primary contact.
- After the call is answered, DTU initiates subsequent calls every 20 minutes until migration resumes.

# Telemetry

Telemetry allows logs and metrics from DTU migrations to be securely pushed to an ICAWS S3 bucket for debugging, triaging issues, or product improvement.

- Telemetry is disabled by default. The migration project manager must have customer consent before enabling telemetry.
- Logs and metrics can be enabled individually or as a group.
- DTU does not capture data from Teradata user tables or customer SQL.
- Telemetry collects logs from DTU docker machine, DSC machine, source Teradata nodes and target Teradata nodes.

This table shows the data that is collected.

| Information | Collected from | Masked before Pushing to S3 |
|---|---|---|
| Non-customer SQLs to get Teradata dictionary information | Logs | No |
| Non-public IPs of source, target, DSC and DTU machines | Logs, Metrics | Yes |

| Information | Collected from | Masked before Pushing to S3 |
|---|---|---|
| Machine names, hostnames, mail server names [ Non FQDN short names, that is without dots (.) ] | Logs, Metrics | No |
| Fully Qualified Domain Name (FQDN) | Logs, Metrics | Yes |
| Database, user, object, column names that are present on source database and target database. | Logs, Metrics | No |
| Output of Teradata utilities checktable, scandisk, ferret, dip. | Logs, Metrics | No |
| Data demographics - database, object sizes | Logs, Metrics | No |
| Types of tables: PI, NOPI | Logs, Metrics | No |
| Emails of people monitoring migration, such as, migration consultants, engineers, and customer | Logs | Yes |
| Names of Teradata personnel monitoring the migration, such as, migration consultants and engineers | Logs | No |
| Phone numbers of Teradata personnel monitoring the migration, such as migration consultants and engineers | Logs | Yes |
| dbscontrols, amps, nodes, disk arrays information from both source and target | Logs, Metrics | No |

## Configuring Telemetry

For telemetry, the outbound 443 port must be opened from the DTU VM.

At the end of configuration a Telemetry UUID is generated, which is unique to each DTU installation. Logs and metrics are stored in a folder in the S3 bucket with the Telemetry UUID as the folder name.

1. Get the telemetry credentials from DTU, Engg Support Team:

| Item | Credential |
|---|---|
| Bucket Name | |
| AWS Access Key | |
| AWS Secret Key | |
| Region | |

**Note:**

For cloud deployments, keys are already populated in the system

2. Log in to the DTU node using SSH.

3. Go this folder:
   `cd /var/opt/teradata/dtu/tdm`
4. Run this script:
   `sh configure_telemetry.sh` *option*

   where *option* is one of the following:

   - `off` - Disable telemetry
   - `logs` - Enable telemetry only for logs
   - `metrics` - Enable telemetry only for metrics
   - `logs_and_metrics` - Enable telemetry for logs and metrics
   - `status` - print current telemetry status
5. Enter AWS credentials.
   Credentials are validated using a sample API request to S3.

   The script may take 4 to 5 minutes to update the telemetry state and restart DTU services.

   If you run the script again (for example, to change options), the same credentials are used.

   If the S3 access validation fails, contact DTU, Engg Support Team.

```
kmastertdm02:~ # cd /var/opt/teradata/dtu/tdm/
kmastertdm02:/var/opt/teradata/dtu/tdm # sh configure_telemetry.sh logs_and_metrics
------------------------------------------------------------------------------------------------------------------------
INFO: Running configure_telemetry scipt in onprem Environment.
------------------------------------------------------------------------------------------------------------------------
Checking if there are any existing keys...
Could not verify any existing credentials. Please enter the inputs.
Enter telemetry s3 bucket name:
telemetry-dtu-bucket-staging
Enter aws access key:
A****************N
Enter aws secret key:
4R********************************6k
Enter aws s3 region. Type Enter to use Default value [us-west-2]

Using Default region value us-west-2.
------------------------------------------------------------------------------------------------------------------------
INFO: Validating the input provided credentials
------------------------------------------------------------------------------------------------------------------------
Credential_validation: INFO     Response code: 200

Credential_validation: INFO     Verification is successful for aws keys.
------------------------------------------------------------------------------------------------------------------------
INFO: Verification was successful with input provided keys.
------------------------------------------------------------------------------------------------------------------------
Recreating tdm_tbarls_1 ... done
Recreating tdm_ls15_1   ... done
Waiting for logstash containers to start... It may take 3-5 mins to start fully.
[2020-09-15T07:48:04,180][INFO ][logstash.agent           ] Successfully started Logstash API endpoint {:port=>9600}
[2020-09-15T07:48:37,971][INFO ][logstash.agent           ] Successfully started Logstash API endpoint {:port=>9600}
------------------------------------------------------------------------------------------------------------------------
INFO: Telemetry set to logs_and_metrics successfully.
------------------------------------------------------------------------------------------------------------------------
-----------------------------Telemetry Details-----------------------------------------
S3 Bucket Name:  telemetry-dtu-bucket-staging
Telemetry UUID: f57248ff-77ec-5872-8374-d238b31ef2a3
---------------------------------------------------------------------------------
```

# Overall DTU Workflow

1. Teradata account team works with the customer. They explain DTU and what's involved. They give the *Client Guide* to the customer and work with the customer to meet requirements and initiate migration. The client guide includes the following information:
   - What does and does not get migrated.
   - How the customer can reduce outage time.
   - Structure and requirements; such as, DTU host, IP addresses, user with access, and port access.
   - Actual migration flow.
2. *LS2340_DTU_MIGRATION* change control is used for both onprem to onprem and onprem to cloud migrations.
   - [On-premises to Cloud] Vantage is automatically provisioned. L2 sets up network connectivity and provisions the systems for deployment. DTU Engineering deploys DTU for Cloud and notifies the CS/MS migration team using Service Now.
   - [On-premises to On-premises] Change control team sets up the target, source, and DTU host systems. They verify connections, ports, IP addresses, and other requirements. When they are done, they notify the CS/MS team using Service Now.
3. [On-premises to On-premises] CS/MS deploys DTU.
4. CS/MS creates DTU job.
5. CS/MS runs the premigration assessments and give the customer the results (several days to a week before the planned migration date).
6. Customer fixes any problems.
7. Rerun the full or partial assessment. Run check table one last time.

   Assessments expire after 30 days. If the assessment is expired, you cannot migrate the data and need to reassess.
8. Migrate the data.
9. Post migration validation runs automatically at the completion of migration.
10. Hand off for migration completion:
    - [On-premises to On-premises] Use Service Now to return to CC team for completion.
    - [On-premises to Cloud] If necessary, use Service Now to have L2 restore the MLE.

# Data Transfer Utility Deployment

For Onprem to Cloud migrations, deployment of DTU is handled by DTU Engineering.

For Onprem to Onprem migrations, CS/MS follow the instructions here.

If you need assistance, contact: DTU, Engg Support Team.

## Deployment Overview

After installing Ansible and updating its inventory file, a single deployment script does the following:

- Spins Docker VM and a DSC TD VM on a KVM Hypervisor on the DTU host.
- Deploys the DTU services on the Docker Node.
- Installs the necessary DTU packages on the DSC, source, and target to proceed with data migration.

## Deployment Prerequisites

### [On-premises to On-premises]

The following are required before deployment can begin:

- DTU host: SLES 12 SP3 physical machine (48 GB memory, 500 GB hard drive, 20 CPU)

  **Important:**

  This SLES 12 SP3 iso is required: `SLE-12-SP3-Server-DVD-x86_64-GM-DVD1.iso` (Go to https://sdartifact.td.teradata.com/artifactory/pkgs-generic-released-sd/td.suselinux-x8664/susemedia/sle-12/SLE-12-SP3-Server-DVD-x86_64-GM-DVD1.iso)

- ssh connectivity to the source and target systems from the DTU host
- Two static IP addresses in the SLES 12 SP3 system subnet
- Source and target database systems are set up with the required database versions
- IP addresses for the source and target systems (If it's a multi-node system, the control node information is sufficient.)

See Verifying On-Premises Prerequisites.

### [On-premises to Cloud]

The following are required before deployment can begin:

- AWS roles are created in customer account.
- Network connectivity (Dx), with required opened ports, between target ICAWS and the on-premises source

Once deployment is done:

- Place CS/MS VDI on allowlist
- Enable SSH access for CS/MS team on the target nodes

## Verifying On-Premises Prerequisites

Use these steps to verify the deployment prerequisites are correct.

1. Check for 20 CPU and 48 GB memory in the SLES 12 SP3 DTU host. Connect to the host and issue these commands:
   a. Verify the CPU:
      `grep -c ^processor /proc/cpuinfo`
   b. Verify the memory:
      `free -g | awk 'NR==3{printf "%s\n", $4 }'`
2. Verify the correct database versions for both source and target systems, by connecting to each system and using this command:
   `pdepath -i`
   The minimum versions are shown in the table:

| Package | Source Version* (minimum) | Target Version* (minimum) |
|---|---|---|
| PDE | 15.10.07.61<br>16.20.43.01 | 16.20.43.01<br>17.00.00.00 |
| PDEGPL | 15.10.07.61<br>16.20.43.01 | 16.20.43.01<br>17.00.00.00 |
| TDBMS | 15.10.07.61<br>16.20.43.01 | 16.20.43.01<br>17.00.00.00 |
| TDGSS | 15.10.07.61<br>16.20.43.01 | 16.20.43.01<br>17.00.00.00 |
| TGTW | 15.10.07.61<br>16.20.43.01 | 16.20.43.01<br>17.00.00.00 |
| *Teradata Database 16.00 or 16.10 are not supported. | | |

3. Verify the database is running in both the source and target system by connecting to each system using this command:
   `pdestate -a`
4. Verify that the IP address assigned to the DTU host is static.
   a. Connect to the DTU host.
   b. Issue this command, which returns the IP for the DTU host:
      `hostname -i`
   c. If the hostname command returns an error, add the following entry to the `/etc/hosts` file in the DTU host:

<*DTU-host-ip*> <*DTU-host-name*>

d. Issue this command, which results in an interface name:
`netstat -ie | grep -B1 `hostname -i` | head -n1 | awk '{print $1}'`

e. Insert the interface name that results from the netstat command into this one:
`cat /etc/sysconfig/network/ifcfg-<interface-name>`

```
NPARCRsles12:~ # netstat -ie | grep -B1 `hostname -i` | head -n1 | awk '{print $1}'
p3p1
NPARCRsles12:~ # cat /etc/sysconfig/network/ifcfg-p3p1
BROADCAST=''
DHCLIENT_SET_DEFAULT_ROUTE='yes'
ETHTOOL_OPTIONS=''
MTU=''
NAME='I210 Gigabit Network Connection'
NETMASK=''
NETWORK=''
REMOTE_IPADDR=''
STARTMODE='auto'
BOOTPROTO='static'
IPADDR='153.65.45.168/23'
NPARCRsles12:~ #
```

5. If root credentials are provided by the customer, skip this step. If a sudo user is provided by the customer, make sure the user is added to `/etc/sudoers` file with NOPASSWD. Contact the site team or customer to add it if necessary.
   For example if tdm_user is the ssh user name, the following line should exist:

   ```
   tdm_user ALL=(ALL) NOPASSWD: ALL
   ```

6. Verify no bridge network exists on the DTU host:
   a. Connect to the DTU host with putty.
   b. Issue: `brctl show`
   c. If a bridge network is shown, contact the site team or customer ro remove it.
7. Verify the date and time of the DTU host. Set the date and time if necessary. If the system has Internet access, set the time and date using this command:
   `date -s "$(curl -s --head http://google.com | grep ^Date: | sed 's/Date: //g')"`

# Deploying DTU

Follow these steps for Onprem to Onprem. Onprem to Cloud solutions are deployed by the L2 team.

If you need assistance, contact: DTU, Engg Support Team.

Logs are located in: `/var/opt/teradata/dtu_deploy/dtu_deploy_logs`

1. Log in to the Axeda using the CS user credentials.
2. Open a remote session to the DTU host.
3. Create a packages directory in the DTU host using this command:
   `mkdir -p /var/opt/teradata/dtu_pkgs/`

If a previous directory exists, use this command first:

```
rm -rf /var/opt/teradata/dtu_pkgs/
```

4. Log in to Artifactory and download the software to the DTU host using these commands:
   ```
   until curl -u <username>:<password> -C - --retry
   999 https://sdartifact.td.teradata.com/artifactory/pkgs-external-released/DTU/
   v1.x.x/On-Prem/DTU-BUNDLE.tar.gz -o /var/opt/teradata/dtu_pkgs/DTU-BUNDLE.tar.gz;
   do :; done
   ```
   You can also download using FTP.
5. Create a directory for the deployment scripts using this command:
   ```
   mkdir -p /var/opt/teradata/dtu_deploy
   ```
   If a previous directory exists, use this command first:

   ```
   rm -rf /var/opt/teradata/dtu_deploy
   ```
6. Download the scripts from Artifactory:
   ```
   curl -u <username>:<password> https://sdartifact.td.teradata.com/artifactory/pkgs-
   external-released/DTU/v1.x.x/On-Prem/dtu-deployer.tar.gz -o /var/opt/teradata/
   dtu_deploy/dtu-deployer.tar.gz
   ```
7. Extract `dtu_deployer.tar.gz`:
   ```
   cd /var/opt/teradata/dtu_deploy
   tar zxvf dtu-deployer.tar.gz
   ```
8. Install Ansible and its dependency software using: `install_ansible.sh`.
   ```
   cd /var/opt/teradata/dtu_deploy
   sh install_ansible.sh
   ```
9. Update the Ansible inventory file with Docker, DSC, source, and target machines.
   `/var/opt/teradata/dtu_deploy/inventory`
   For Docker and DSC, provide static IPs.

```
# Only change the values where requested
# For source and target provide only the controller node values not all the node
values
# Don't change the passwords for dsc, docker

[dsc]
<dsc_ip_here>
ansible_host=<dsc_ip_here>
ansible_user=root
ansible_password=iumb123

[source_nodes]
<source_control_node_ip_here>
ansible_host=<source_control_node_ip_here>
ansible_user=<source_control_node_ssh_username>
ansible_password=<source_control_node_ssh_password>
```

```
[target_nodes]
<target_control_node_ip_here>
ansible_host=<target_control_node_ip_here>
ansible_user=<target_control_node_ssh_username>
ansible_password=<target_control_node_ssh_password>

[docker]
<docker_ip_here>
ansible_host=<docker_ip_here>
ansible_user=root
ansible_password=tdc
```

10. Update the domains, nameservers, ntp variables in `/var/opt/teradata/dtu_deploy/group_vars/all/vars.yaml` as required.
    These requirements vary by customer. The example points to Teradata internal domains, nameservers, and ntp.

```
---

#Provide domain names with spaces

domains: "td.teradata.com labs.teradata.com"

#provide the name servers separated with ","

nameservers: ["153.65.2.111","153.65.2.12"]

#provide the ntp list separated with ","

ntp_list: "time00.teradata.com,time01.teradata.com,time02.teradata.com"

## do not change the below values

gateway: XXXX
images_dir: /var/opt/teradata/kvm_images/
iso_path: /var/opt/teradata/sles12_iso/

#Phone Notification keys
NOTIFICATION_API_KEY: ""
NOTIFICATION_API_SECRET: ""
NOTIFICATION_API_SIGNATURE: ""
```

11. Use `screen` to open a session in the background and run the deployer script so it runs in the background:

```
screen -S dtu_deploy -L
cd /var/opt/teradata/dtu_deploy/
sh dtu_deployer.sh -i inventory
```

You are prompted to choose to enable or disable the Phone Notification feature. If you select enable, you need to enter the Notification API Keys.

To get the Notification API Keys, contact DTU, Engg Support Team.

```
korbel2:/var/opt/teradata/dtu_deploy # ./dtu_deployer.sh -i inventory
-------------------------------------------------------------------------------------------------------------
-----------------------------------DTU DEPLOYMENT--------------------------------------------------------
-------------------------------------------------------------------------------------------------------------
INFO: Phone notification configuration
-------------------------------------------------------------------------------------------------------------
Credential_validation: INFO     Validation failed for existing Phone notification credentials in group_vars/all/vars.yaml.
Do you want to enable Phone notification feature? Enter yes/y/no/n
yes
Enter notification api key: ********
Enter notification api secret: **********************
Enter notification api signature: ********************************************
Credential_validation: INFO     Notification call response: 200

Credential_validation: INFO     Phone notification feature is enabled for this deployment
-------------------------------------------------------------------------------------------------------------
INFO: Phone notification configuration is completed
-------------------------------------------------------------------------------------------------------------
```

The deployment script runs for 60 minutes, depending on the source and target system nodes. See Stages of Deployment.
While the script is running, you can use these commands to come out of the screen and connect again:

`Ctrl + A + D` to come out of the screen

`screen -x dtu_deploy` to see the output again.

When deployment is complete, deployment will show the URL to launch the DTU UI:

```
----------------------------------------------------------------------
INFO: DTU services post checks passed
----------------------------------------------------------------------
Decryption successful
----------------------------------------------------------------------
----------------------------------------------------------------------
INFO: PUTTools has been upgraded in Below systems.
----------------------------------------------------------------------
NODE_TYPE      OLD_VERSION                  NEW_VERSION
source_nodes   PUTTools-02.01.00.13-01      PUTTools-02.02.00.05-01
----------------------------------------------------------------------
Migration UI can be accessed at
----------------------------------------------------------------------
https://10.25.27.15:31000
----------------------------------------------------------------------
In PMA Input use the below information for source,target and DSC
----------------------------------------------------------------------
Source Database Machine Name : sdt34699.labs.teradata.com

Target Database Machine Name : sdt34570.labs.teradata.com

DSC Machine Name             : dtudsc
----------------------------------------------------------------------

UUID for this deployment: b8ecf97e-0c2e-5759-846b-8752e1bb91ef
```

# Prepare for Migration

## Before You Start

If you need assistance, contact: DTU, Engg Support Team.

### Create a Migration User

Create a migration user on the source system and grant all the required access rights for migration.

[On-premises to on-premises] Migration user name and password must be used to log in to the DTU host.

After the migration, the migration user is present on both the source and target systems. Drop the migration user from both systems.

### Use Network Fabric for the Migration

You must define a network fabric for an on-premises to on-premises migration that has direct connected nodes (for example, source_node1 to target_node1 and source_node2 to target_node2) and no switch.

To use network fabric for migration you must configure the DSC and update the bandwidth in the `application-prod.properties` file:

- Configure the DSC for both the source and target systems. See Configuring the DSC for Network Fabric. You must reconfigure the DSC if the following occurs:
  - sysinit: Reconfigure the target system.
  - Node failure during migration and the database restarts with HSN node or vproc migration: Reconfigure the source or target system.
- When using network fabric, the pre-migration assessment uses the bandwidth specified in the `application-prod.properties` file to estimate the migration time. For best results, update the file with the actual bandwidth before running the pre-migration assessment. See Updating the application-prod.properties File.

## Configuring the DSC for Network Fabric

See config_systems in the *Teradata® DSA User Guide* for usage.

1. Configure the DSC for both the source system and the target system using the `dsc config_systems` command.
   Depending on the machine name you use in the UI, use the following for the <*system_name*>:

| Machine Name | <*system_name*> |
|---|---|
| **FQDN**<br>`server1.example.com` | First word before the first dot (.) |

| Machine Name | *<system_name>* |
|---|---|
| **IPv4**<br>192.0.2.255 | Replace dots with underscore (_) |
| **IPv6**<br>2001:db8::2:1 | Full IP without colons (:)<br>Do not use a link-local IPv6 address (begins with `fe80`). |

2. Restart bardsmain on the system configured with DSC.

## Updating the `application-prod.properties` File

If you are using network fabric, you need to update this file with the actual bandwidth value in MBps.

1. Log on to the server where DTU is running.
2. Access the PMA container:
   `docker exec -it tdm_pma_1 sh`
3. Open the `application-prod.properties` file at:
   `/opt/teradata/tdm-pma/application-prod.properties`
4. In the file, `/opt/teradata/tdm-pma/application-prod.properties`, update `default.bandwidth.in.MBps=1024` with the actual bandwidth in MBps.
   `sed -i "s/default.bandwidth.in.MBps=1024/default.bandwidth.in.MBps=<exact-value>/g" /opt/teradata/tdm-pma/application-prod.properties`

# Creating the DTU Job and Running the Assessment

Follow these steps to complete DTU configuration and run the pre-migration assessment job.

Beginning with DTU 1.3, you can run a pre-migration assessment with only the source system available. See the List of Pre-Migration Assessments to learn which assessments aren't done when the target, DSC, or media server information is not available.

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**Important:**

You cannot run a migration without running an assessment with both source and target systems.

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If you need assistance, contact: DTU, Engg Support Team.

### Creating the Job

1. Open the DTU dashboard.
   a. Open Chrome on the SWS.
   b. Enter the IP address and port in the address bar, where the IP address is of the server where the DTU services are running and the port number is for the UI.
      `https://<ip_address>:31000`
2. Sign in as the migration user.

3. Select **Create DTU Job**.
4. Enter the information requested and select **Submit**.

| Prompt | Description |
|---|---|
| DTU Job Name | One to 50 characters (a-z, A-Z, 0-9, _) |
| Source System Details | System Name<br>Database username and password<br>**Note:**<br>You can edit the password when assessment, migration, or validation are not running. |
| Target System Details | System Name<br>Database username and password<br>**Note:**<br>• Unneeded for source-only assessment.<br>• You can edit the password when assessment, migration, or validation are not running. |
| DSC System Details | System Name<br>**Note:**<br>Unneeded for source-only assessment |
| Media Server IP Address & Bandwidth | • No network fabric configured: Select the IP address and Bandwidth in MBps.<br>• Network fabric is configured: Update the `application-prod.properties` file with the bandwidth for better migration time estimate. See Updating the application-prod.properties File.<br>**Note:**<br>Unneeded for source-only assessment |
| Migration User Details | Migration username and password |
| Migration Type | • Full System Migration: Migrates all databases in one operation, unless databases are specifically excluded in an exclude list.<br>Must be a .txt file that includes a simple list of database names, separated by CR /LF.<br>`optbase_u1`<br>`user2`<br>**Important:**<br>You cannot exclude these databases: DBC, SYSLIB, SYSUDTLIB, or TD_SERVER_DB.<br>• Selective migration: Migrates selected sets of databases at a time<br>◦ Include DBC: Required for first migration<br>◦ Include database list [Required]: |

| Prompt | Description |
|---|---|
| | Must be a .txt file that includes a simple list of database names<br>`optbase_u1`<br>`user2` |
| Email Notification | Configure the SMTP server details to receive migration notifications.<br>• Mail Server address: `smtp.example.com` or IP address<br>• Port Number: `465` or `587` are common<br>• Encryption type: SSL, TLS, or None (Make sure port matches encryption type.)<br>• Username: SMTP user name<br>• Password: SMTP password |
| | Choose how often and under what circumstances to receive emails.<br>• Can enable or disable notifications<br>• Can add or remove recipients<br>• Choose to receive different types of notifications<br>◦ Progress notifications<br>◦ Error notifications<br>◦ Start and end notifications |
| Phone Notification | Add contacts and phone numbers and initiate test calls. |

**Running the Assessment**

5. Click **Start Assessment**.
6. Select the **Assessment Type** then **Submit**.
   - Full Assessment: Always use Full Assessment the first time. It checks many items such as database space and HUT locks. You cannot start a migration unless Full Assessment has been run at least once. For a full list of assessments, see List of Pre-Migration Assessments.

     [Recommendation] Run Full Assessment again, just before migration, if any corrections or changes have been made to data on the source or settings on source or target. Assessments expire after 30 days and must be rerun before migration.
   - Partial Assessment: Use to verify corrections made to a particular section.
   - Check Table: Select whether to run Check Table and at what level.
   - Assessment Name: Up to 50 characters, alphanumeric plus underscore, no spaces.
7. Once the assessment is complete, select a category to see more information.
   The assessment results are in several categories:
   - Details & Status: Assessment progress
   - Functional Assessments, Performance Assessments, and Storage Assessments: Include results from items listed in List of Pre-Migration Assessments.
   - Information: System configuration and skipped databases

8. If any errors occur, see Fault Isolation During DTU Job Creation and Assessment
9. [Optional] Use ⬇ in the Assessment Status area to download a PDF of the assessment information for the customer.

**Note:**

If source-only assessment is run, the Start Migration button is unavailable.

**Reassessing after Problem Fixes**

10. After any problems are fixed, select **Re-Assessment** to rerun the checks.
    You can choose to run a partial assessment and only recheck the area where problems were corrected.
    - Blocker issues from the parent assessment are automatically selected.
    - You can explicitly select other issues.

## List of Pre-Migration Assessments

The Pre-Migration Assessment runs the assessments listed in the table. Some assessments are not run in a source-only pre-migration assessment. They are noted in the table.

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| dbcRoles | List of DBC default roles that will be set to NULL before migration. | Warning | Yes | Yes | Yes | No |
| nonEmptyDbql | If there are Database Query Logging (DBQL) tables on source system, since they will not be migrated, except for DBQLRuleTbl and DBQLRuleCountTbl tables. | Warning | Yes | Yes | Yes | No |
| AccessRights | Access rights or role required by the migration user. | Critical | Yes | Yes | Yes | Yes |
| Checktable | Check table utility will be executed at given level on source system to detect any issues with data. | Critical | Yes | Yes | Yes | Yes |
| CompressionDriver | If source system has Hardware Compression driver, then check if target system also | Critical Warning for source-only assessment | Yes | Yes | Yes | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| | has the Hardware Compression driver.<br>For source-only assessment, checks source system only. | | | | | |
| dbscontrol | Check if the DBSControl fields are same in source and target systems, as the differences can result in errors or performance problems during migration.<br>For source-only assessment, checks source system and recommends DBSControl values that must be set on target system. | Critical if few purchased flags don't match.<br>Warning for source-only assessment | Yes | Yes | Yes | Yes |
| dbsSpace | Database space related errors may occur during restore.<br>Requires target system availability. | Critical if estimated Max Perm space is more than target Max perm space.<br>Warning in all other scenarios | Yes | Yes | Yes | Yes |
| MigrationTimeEstimate | Estimated time for migrating entire source system data to target system.<br>Requires target system availability. | Critical if time estimation fails or has errors in computation.<br>Warning if estimation was computed properly. | Yes | Yes | Yes | Yes |
| hutLocks | Host utility locks on database objects as they can cause migration to hang. | Critical | Yes | Yes | Yes | Yes |
| OnlineArchive | Checks whether online archive is enabled on | Critical if enabled on | | | | |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| | any database on the source system. | DBC or SYSUDTLIB databases.<br>Warning if enabled on any user database. | | | | |
| pendingLoadJob | Migration may hang if there are pending or active load jobs. | Critical | Yes | Yes | Yes | Yes |
| tdwm | IUMB<br>Migration may fail due to inconsistency of TDWM configuration on source system; that is, TDWM is inactive even though the CURRENT_CONFIG_ID value of TDWM.GlobalParams table is not 0. | Critical | Yes | Yes | Yes | Yes |
| transparentHugePages | Migration may hang or give poor performance under certain conditions and workloads because the listed systems have Transparent Huge Pages (THP) enabled. | Critical | Yes | Yes | Yes | Yes |
| puttoolsVersion | Migration may fail due to incorrect version of PUTTools on target system.<br>Requires target system availability. | Critical | Yes | Yes | Yes | Yes |
| dbsOverwritten | List of databases that are non-empty or non-existant on the target system.<br>Requires target system availability. | Critical if database not existing on target are provided as include list.<br>Warning if databases provided as include list are not empty on target | No | No | No | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| dbcMigration | For selective-include databases, DBC database migration must be done prior to migrating user-created databases. Requires target system availability. | Critical | No | No | No | Yes |
| OnlineArchive | Check whether online archiving is enabled on any databases on source. | Critical if online archiving is enabled on DBC and/or SYSUDTLIB database(s). Warning if online archive enabled on other databases. | Yes | Yes | Yes | Yes |
| ntpstatus | Migration cannot be done because NTP service is not running or there is a drift in listed nodes. | Critical if NTP is not running. Warning if drift is detected. | Yes | Yes | Yes | Yes |
| Cod Settings | COD settings below 100% can impact performance of migration. | Warning | Yes | Yes | Yes | Yes |
| fallback down amp | List of non-fallback tables that will not be migrated because there are down AMPs. | Warning | Yes | Yes | Yes | Yes |
| heatmap | Migration will not carry the data temperature information from source system to target system because the DisablePortableHeatmap DBSControl flag is TRUE on the source system. | Warning | Yes | Yes | Yes | Yes |
| hotLowerBound | If HOT data portion of the data on source system is lower than the size of | Warning | Yes | Yes | Yes | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| | SSDs on target system because this may lead to poor utilization of SSDs.<br>Requires target system availability. | | | | | |
| geoSpatial | IUMB<br>During restore, Teradata Geospatial cannot be installed because of the pre13.0 Geospatial (external UDT version). | Warning | Yes | Yes | Yes | Yes |
| hashfunc | IUMB<br>List of PPI tables that will be re-validated after restoring. Because of this, overall migration duration may be higher. | Warning | Yes | Yes | Yes | Yes |
| noSpl | IUMB<br>Stored procedures will be unusable as they do not have source code and therefore cannot be recompiled on the target system. | Warning | Yes | Yes | Yes | Yes |
| reservedW | IUMB<br>Errors might occur during migration or after migration due to the presence of the following reserved words in object definitions.<br>Requires target system availability. | Warning | Yes | Yes | Yes | Yes |
| tptReservedW | IUMB<br>If there are Teradata Parallel Transporter reserved words in object definitions on source system because this can cause errors when using TPT on target system.<br>Requires target system availability. | Warning | Yes | Yes | Yes | Yes |
| triggers | IUMB | Warning | Yes | Yes | Yes | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| | Migration may fail because there are triggers defined on TDWM. RULEBYPASS table. | | | | | |
| zones | IUMB<br>If there are databases in a secure zone, because migration of databases within a secure zone can be done only by the owner of the zone, and that owner cannot be DBC. | Warning | Yes | Yes | Yes | Yes |
| inConsistentRi | Checktable minimum level at 1 if no level specified.<br>Inconsistent referential indexes will be re-validated in post data restore and their state will be changed to valid referential indexes. | Warning | Yes | Yes | Yes | Yes |
| invalidRi | Checktable minimum level at 1 if no level specified.<br>Invalid referential indexes will be re-validated on the target system and their RI state will be changed to valid referential indexes. | Warning | Yes | Yes | Yes | Yes |
| unResolveRi | Checktable minimum level at 1 if no level specified.<br>If there are unresolved referential indexes, because the tables involved in unresolved referential indexes will not be migrated. | Warning | Yes | Yes | Yes | Yes |
| riError | Errors may occur during restore process on target system due to the | Warning | Yes | Yes | Yes | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| | listed referential index error tables on the source system. | | | | | |
| software | After migration, issues may occur while using the target system because the following third-party software (protegrity and SAS) that is present on source system is not present on target system. | Warning | Yes | Yes | Yes | Yes |
| userDefinedCostProfile | If there are user defined cost profiles on the source system because they will not be migrated. this may cause applications on the target system to fail after migration is done. | Warning | Yes | Yes | Yes | Yes |
| metricCollection | If the TVS allocation method on the source system is TRADITIONAL_ TERADATA and on the target system is ONE_ DIMENSIONAL, TVS metric collection should be done on the source system before starting migration.<br>Requires target system availability. | Warning | Yes | Yes | Yes | Yes |
| securityConfig | modified on source then should be handled | Warning | Yes | Yes | Yes | Yes |
| custompsf | The custom security configuration will not be migrated to target system. | Warning | Yes | Yes | Yes | Yes |
| systemInformation | Checks the configuration of the source and target system.<br>For source-only assessment, checks source system only. | NA | Yes | Yes | Yes | Yes |

| Component | Description | Severity | Full | Full with Exclude | Selective with IncludeDBC True | Selective with IncludeDBC False |
|---|---|---|---|---|---|---|
| dbsskip | Constant value. databases that will not be migrated. | NA | Yes | Yes | Yes | Yes |
| Check Access logging | Check access logging enabled on all source and target systems.<br>For source-only assessment, checks source system only. | Warning | Yes | Yes | Yes | Yes |

# Data Migration

## Skip Stats Collection

Before starting the migration, the migration consultant copies the stats tables (DBC.StatsTbl, DBC.QueryStatsTbl, DBC.ObjectUsage) on the source to NPARC_DMS database using NPARC scripts.

The migration consultant should opt(Tick) for “Skip Stats Collection” flag in UI while starting the migration.

NPARC_DMS database is migrated from source to target during migration.

Post DTU migration, the migration consultant copies the stats table from NPARC_DMS database to the actual stats tables on the target using NPARC scripts.

## Skip Join/Hash Indexes

System-defined join indexes are skipped only if the source and target databases have the DR194717 fix.

Before starting the migration, the migration consultent collects SJI information on the source using NPARC.

Migration consultant should opt(Tick) for “Skip Indexes” flag in UI while starting the migration.

Post DTU migration, the migration consultant uses NPARC to re-create system-defined join indexes on the target.

Customer must create hash and join indexes on the target after migration.

## Migrating the Data

**Prerequisite:**

Full assessment was run and customer has completed all needed changes.

If you need assistance, contact: DTU, Engg Support Team.

1. Run Full Assessment one last time before migrating.
2. Verify the Assessment Status on the Dashboard.
   - Pending: Assessment in progress.
   - Success
   - Warning: Verify warnings are ok before proceeding.
   - Failure: Must fix problems before migration.
   - Expired: Full assessment must be completed within 30 days of migration.
3. With a clean assessment, select **Start Migration**.

4. Enter a name for the migration job.
5. [Optional] Select **Skip Stats Collection** and **Select Indexes**.
6. Select **Submit**.
   You can see the migration progress at the top of the migration pane.
7. Select **View Details** to see more information during the migration.
   Details include:
   - Details & Status: Includes amount complete, elapsed time, and more.
   - Steps: Detailed list of the completed steps and the ones remaining
   - Validation Report: List checks for several items, including: missing objects, row counts, access rights, and more.
   - Assessment Errors
   - Migration Errors: Click **View Diagnostics** for more information and recovery steps.
   - Validation Errors: If any checks failed during the Post-Migration Validation, they are listed here.

**Related Information:**

Error Codes during Migration and Post-Migration Validation
Error Codes during Error Detection and RCA

## List of Post-Migration Validations

This service validates the data after migration. It checks correctness of the data and detects issues that would prevent users from using the new system. PMV is invoked by the migration service at the end of each job and at the end of the migration. This table lists the different validations that are performed.

The following databases are not validated for three issues (Missing Objects, Row Counts, and Access Rights):

DBCMNGR, PDCRSTG, PDCRCANARY1M, SQLJ, PDCRCANARY0M, TD_SYSFNLIB, TD_SYSXML, PDCRCANARY3M, PDCRADM, TDSTATS, PDCRACCESS, EXTERNAL_AP, PDCRINFO, TD_SERVER_DB, CRASHDUMPS, SYSUDTLIB, PDCRCANARY4M, SYSSPATIAL, LOCKLOGSHREDDER, PDCRTPCD, PDCRADMIN, ALL, EXTUSER, PUBLIC, PDCRDATA, TD_SYSGPL, SYSBAR, DBC, PDCRCANARY2M, TDPUSER, SYSTEMFE, TDWM, SYSUIF, TDQCD, SYSLIB, TDMAPS, SYS_CALENDAR, SYSJDBC, SYSADMIN, DEFAULT

| Validation | Brief Description | What validation do we do? |
|---|---|---|
| Missing Objects | Lists all objects missing on target when compared with source. | We check if all the objects are migrated to target. We compare the objects of source with target and list all the objects that are missing on target. We consider all objects except journal tables. Journal tables are not migrated by DSA, so we don't check journal tables.<br>• If an object is present on source system but not in target system, it is treated as a missing object.<br>• If an object is present on target system but not in source system, it is not reported.<br>**Note:**<br>• Excluded databases are not validated.<br>• System databases listed before this table are not validated. |
| Row Counts | Lists the tables whose row count is different on target when compared to source. | We check whether the number of rows of a table on source and target are the same. We compare row counts for Queue tables, NOPI tables and regular tables. For the tables whose row count doesn't match, we list the table names along with its row count on target and source machines.<br>**Note:**<br>• Excluded databases are not validated.<br>• System databases listed before this table are not validated. |
| Check Table | Lists the tables along with error information when check table failed. | Checktable is run on target system in parallel mode with error only option. It will check dictionary as well as user-defined objects. Checktable will scan Tables, Journals, JIs, HIs, SPs, UDFs, UDMs, JARs and UIFs. The checktable output is parsed to extract all the |

| Validation | Brief Description | What validation do we do? |
|---|---|---|
| | | errors grouped by error text. We will show only errors and warnings and don't show skipped type errors.<br>Check table command that we use: check all tables at level one with no error limit skiplocks in parallel priority=m error only<br>**Note:**<br>Excluded databases are not validated. |
| DbcCheckTable | Lists the DBC tables along with error information when check table failed. | Checktable on DBC user is run at level two at the end of migration. The command used is:<br>`check DBC at level two with no error limit skiplocks in parallel priority=m error only ;` |
| Scandisk | Shows the scandisk output. | Runs scandisk utility using Ferret with priority 0 (Low) and shows the report if there are any errors. |
| TdLocaleDef | Lists the differences between `tdlocaledef` file of source and target. | Compares `tdlocaledef.txt` config file of source system with target system and list out all differences. `tdlocaledef.txt` is used to define or change how the database formats numeric, date, time, and currency output. |
| RI Issues | Lists the tables information who have UnResolved, InConsistent, and Invalid RIs. | Identifies Unresolved, InConsistent and Invalid RIs by using dbc tables.<br>• UnresolvedRI state is seen in case of forward references, where a referential constraint is specified on a Child table that references a non-existent Parent table.<br>• After Restore, the current state of an RI is set to InconsistentRI. They are re-validated using REVALIDATE REFERENCES FOR command.<br>• Invalid state is seen in case of rollback operations on parent tables, where some foreign key values present in child table are missed in Parent table.<br>**Note:**<br>Excluded databases are not validated. |
| Cylinder Allocation By Temperature | Lists the these two ratios on target machine:<br>SSD:HDD<br>HOT: (WARM+COLD) | This issue will compute the ratios of SSD:HDD and HOT data : (WARM+COLD) data on target machine.<br>http://kcs-one.teradata.com/KCS/id/KCS011148<br>http://cks.teradata.com/support/general/kcs.nsf/id/KCS011480<br>https://teraworks.teradata.com/pages/viewpage.action?spaceKey=GSCPDE&title=How+to+change+the+allocation+method |
| Access Rights | Lists the access rights that are extra or missing in target compared to source. | We try to find out if any access rights are missing or added during migration on the target compared to the source.<br>If there are any access rights that are not migrated, then those missing access rights are listed in the output.<br>If there are any extra access rights in the target that are not present in source, then those added access rights are listed in the output. |

| Validation | Brief Description | What validation do we do? |
|---|---|---|
| | | This will list missing or extra added access rights by object wise.<br>**Note:**<br>• Excluded databases are not validated.<br>• System databases listed before this table are not validated. |
| Database/User with Negative Perm Space | Lists the databases or users whose current perm is greater than max perm. | After migration some database/user's current perm may vary due to database settings (for example, fallback or compression) mismatch between source and target systems. This lists all databases whose current perm space is more than max perm space.<br>**Note:**<br>Excluded databases are not validated. |
| Low Spool Space | Evaluates whether the target system is meeting spool space recommendations. | Lists users/databases whose spool space on target system is low. This may be because of difference in compression or fallback protection settings between source and target systems.<br>**Note:**<br>Excluded databases are not validated. |
| Vprocs with less free cylinders | Validates the available free cylinders of AMPs. | Lists the AMPS whose free cylinder availability is less than 15% of total cylinders allocated to the AMP. |

# Access Rights Mismatches That May Show in the Validation Report

Mismatches for access rights may show in the validation report due to new objects and databases that are created by running DIPALL on the target system.

# Objects on Target That May Show as Missing in the Validation Report

Some objects may appear as missing in the validation report even though they are present on the target because of autogenerated names that are different on the target. See the following example.

System defined join indexes have autogenerated names that are recreated on the target as part of the migration. They might be created with different suffix numbers:

- Source: EN_USAGE_INSTANCE_TJ1008
- Target: EN_USAGE_INSTANCE_TJ1032

# Troubleshooting for DTU

## Troubleshooting Deployment

If you need assistance, contact: DTU, Engg Support Team.

### How do I decrypt my Ansible inventory file?

During deployment, the inventory files is encrypted with ansible-vault. If the deployment fails or is cancelled, you must decrypt the inventory file before you can start the deployment again.

```
ansible-vault decrypt inventory --vault-password-file="secrets/.vault_pass.yaml"
```

### Can non-root users run the deployment?

Yes, sudo users can be used for source and target, if the NOPASSWD option for that user is added to the `/etc/sudoers` file in both source and target systems.

### Where are the logs of the deployment script?

Logs are available on the DTU Monitor in: `/var/opt/teradata/dtu_deploy/dtu_deploy_logs`

### If the script exits with errors, can I just restart it?

No, contact DTU Support: DTU, Engg Support Team.

### If the script is stopped (cancelled, power outage), can I just restart it?

No, follow these steps:

1. Run the cleanup script: `sh dtu-cleanup.sh`.
2. Delete the bridge, if it exists.
3. Run the deployment script again.

### How do I know where the execution failed?

The deployment executes in seven stages. Check the logs at: `/var/opt/teradata/dtu_deploy/dtu_deploy_logs`.

At the end of the log, a message tells you during which stage the deployment failed. See Stages of Deployment for a list of the activities in each stage.

## Stages of Deployment

### Stage 1: Pre-deployment checks

- Checks that the Ansible inventory is proper and able to open the ssh connections to source and target.

- Verifies the bridge network is not available in the DTU Monitor.
- Validates that the source and target database systems are up and have the correct database versions.
- Validates all prerequisites.
- If any checks fail, exits the deployment and notifies the user.

### Stage 2: Deploy the VMs

- Install the KVM hypervisor.
- Configure the network public bridge and attach the NIC to the bridge.
- Deploy 2 VMs (1 Docker VM and 1 DSC VM) on the hypervisor using images from the bundle.
- Assign the static IP addresses to all VMs.

### Stage 3: Generates certificates

DTU deployment uses secure communication between the different components (DTU services, tparest, filebeat, ClientHandler, DSC) and the systems.

- Creates the self signed CA.
- Generates ssl certificates for all the services in DTU and signs the certificates with the CA.
- Creates the SAN (Subject Alternative Name) files for the source, target and DSC using the hostnames provided in the inventory.
- Generates the certificates for the source, target, and DSC with SAN and signs the certificates with the CA.

### Stage 4: Deploys the DSC

- Copies the BARCmdline, DSC, filebeat, tdactivemq, and tparest rpm files to the DSC system.
- Removes any existing packages on the system.
- Installs the following packages on the DSC system.
  - BARCmdline
  - DSC
  - filebeat-oss
  - tdactivemq
  - dsc-dtu-agent
- Copies the certificates generated for the DSC system and puts copies in the tparest, DSC, and filebeat installation locations, then restarts the service.

### Stage 5: Deploying to the source system

- Copies the PUTTools, filebeat, and tparest rpm files to the source system.
- Uses pcl to copy the rpms to all the source database nodes.
- Removes any existing filebeat, tparest, and PUTTools packages in the system.
- Installs the following packages in the source database nodes:
  - PUTTools

For target database of 17.00 or later, PUTTools must be 02.02.00.10 or later.

  - filebeat-oss
  - tpa-rest-server

- Copies the certificates generated for the source system and puts copies in the tparest and filebeat installation locations, then restarts the services.

### Stage 6: Deploying to the target system

- Copies the PUTTools, filebeat, ClientHandler, and tparest rpm files to the target database system.
- Uses pcl to copy the rpms to all the target database nodes.
- Removes any existing filebeat, tparest, and PUTTools packages in the system.
- Installs the following packages in the target database system nodes:
  - PUTTools
  - filebeat-oss
  - clienthandler
  - tpa-rest-server
- Copies the certificates generated for the target system and puts copies in the tparest, tdconfig, and filebeat installation locations, then restarts the services.

### Stage 7: Deploying DTU services

- Copies the DTU Docker images to the Docker node.
- Copies the generated certificates to the Docker node.
- Runs the DTU containers with Docker compose.
- Verifies all the containers are up and running.

# Troubleshooting the Pre-Migration Assessment

These tables help with troubleshooting any errors that may occur during the PMA.

If you need assistance, contact: DTU, Engg Support Team.

## Fault Isolation During DTU Job Creation and Assessment

| Error code and message | When? | Remedy |
|---|---|---|
| 2803: Unable to retrieve PUTTools version. | Assessment job tries to verify the PUTTools version on source or target system. | Tpa-rest-server may be down. Restart the server. |
| 2804: PUTTools are not installed on source system. | Assessment job checks whether PUTTools is installed on the source system. | Required version of PUTTools must be installed on the source system. |

| Error code and message | When? | Remedy |
|---|---|---|
| 2904: Postgres database is down. | While assessment job is running, Postgres database went down and is not available for saving and retrieving information for pre-migration assessment service. | Restart the Postgres database service. |
| 2908: Unknown issue while connecting to <source/target> (<system_name>) via JDBC. | When assessment job is running and trying to run some SQL on the source or target system via JDBC. | This is a software issue. Please contact DTU team. |
| 2909: PDE state is down on <source/target> (<system_ name>) database system. | System details are entered for running an assessment job. | Restart the database on the specified system. |
| 2910: Logons are disabled on <source/target> (<system_ name>) database system. | System details are entered for running an assessment job. | Enable logons on the specified database system. |
| 2911: <Source/Target> host (<system_name>) not reachable. | System details are entered for running an assessment job. | Enter correct system details. |
| 2916: Unable to connect to <source/target> system <system_name>. | System details are entered for running an assessment job. | Tpa-rest-server on the specified system may be down. Restart the server. |
| 3005: Given assessment job name already exists. | User enters an assessment job name that was already used in previous assessment runs. | Enter new assessment job name and start the assessment. |
| 3006: Could not connect to tpa-rest-server on source. | When source system details are entered for an assessment job, source system status is verified via tpa-rest-server running on source system. | Restart the tpa-rest-server on the source system. |
| 3007: Could not connect to tpa-rest-server component on target. | When target system credentials are entered for an assessment job, target system status is verified via tpa-rest-server running on target system. | Restart the tpa-rest-server on the target system. |
| 3008: Pre-migration assessment is already running on specified source and target systems. | User tries to submit a new assessment job with source and target systems on which an assessment job is already running. | Verify that an assessment job is not running before trying to start another one. |
| 3009: Assessment with specified assessment name is not running. | User tries to abort an assessment job. | Assessment job must be in a running state to abort. |
| 3012: Child assessment for given assessment name is still running. Please abort child assessment and then delete assessment job. | When user tries to delete an assessment job and is used as parent assessment for a running partial assessment. | Abort the running partial assessment job, and then try to delete the required assessment job. |

| Error code and message | When? | Remedy |
|---|---|---|
| 3014: Parent assessment job name is not valid. | For running partial assessment job, a valid full assessment job name must be given as input. | Enter a valid full assessment job name as parent assessment job name. |
| 3022: On <source/target/DSC> system filebeat is not installed. | During health check of assessment job. | Install filebeat on the specified system. |
| 3026: {0} and {1} must not be same machine. | When assessment job is submitted source and target systems cannot be same. | Give source and target as different systems when giving input to assessment job. |
| 3032: Source and target systems seem to be interchanged. | When assessment job is submitted and source and target system names are interchanged. | Fix assessment job input, give proper source and target system names. |
| 3034: SSL certificates on the <system_name> system are not present or not proper. | During health check of required components when assessment job running. | There is a problem in DTU deployment process, please contact DTU team. |
| 3038: One or more databases do not exist in the source system. | When the database names specified in exclude list `.txt` file are not present in source system. | Remove the database names that are not present in source system from exclude list `.txt` file and upload the modified file. |
| 3039: One or more system databases which can not be excluded from migration are part of the Exclude List. | The exclude list `.txt` file contains DBC, SYSLIB, SYSUDTLIB, or TD_SERVER_DB. | Remove the system database names from exclude list `.txt` file and upload the modified file. |
| 3040: Database(s) do not exist in the source system and system database(s) that cannot be excluded from migration are part of the Exclude List. | The database names specified in exclude list `.txt` file are not present in source system, or the file contains DBC, SYSLIB, SYSUDTLIB or TD_SERVER_DB database names. | Remove the database names that are not present in the source system and system database names from exclude list .txt file and upload the modified file. |
| 3041: Duplicate IPs detected. {0} | A node on source and target have the same IP (different network interfaces having same IP). | Fix the duplicate IPs on the node and submit the system details again. |
| 3042: Duplicate IPs check failed. | While checking for duplicate ips when system details are submitted. | Check whether tpa-rest-server is down on the source/target machine. If tparest-server is up, please contact DTU team. |
| Failed to verify source system health. | While entering source system details during DTU job creation. | Check whether the source server details are correct.<br>Check whether the source server address or host is accessible in the network. |
| Failed to verify target system health. | While entering target system details during DTU job creation. | Check whether the target server details are correct. |

| Error code and message | When? | Remedy |
|---|---|---|
| | | Check whether the target server address or host is accessible in the network. |
| Unable to configure SMTP, please try again later. | When configuring SMTP server for notification. | Check whether the SMTP server details are correct.<br>Check whether the SMPT Server address or host is accessible in the network. |
| Failed to verify DSC system health. | While entering DSC system details during DTU job creation. | Check whether the DSC server details are correct.<br>Check whether the DSC server address or host is accessible in the network. |
| Failed to verify migration user credentials. | While entering migration user details during DTU job creation. | Check whether the migration user details are correct.<br>Check whether migration user is created. |
| Error in creating a new Job. Please try later. | While creating the DTU job. | If unable to create the DTU job please contact DTU support team. |
| File type is not correct. | While giving an input file for exclude database list or include database list during DTU job creation. | Exclude database list and input database list must be in a text file with database names separated by CR/LF. |
| Please select include DBC. | While creating DTU job for selective migration. | DBC migration must be done first for any selective migrations. If the DTU job created is the first selective migration then include DBC. |
| Unable to upload the file. Please try again later! | While creating DTU job, unable to upload the exclude database list or include database list. | Please contact DTU engineering. |
| Source system detail is invalid. | When create DTU job is submitted and source system is not reachable. | Please contact DTU engineering. |
| Email list exceeded 100. | While entering the recipients mail address during DTU job creation. | Only 100 mail address are allowed in each recipient's list. |
| Enter correct email | While adding email address in the email recipient list in the email configuration during DTU create job. | Enter valid email address. |
| Something went wrong, Could not copy. | While copying email address in the email configuration during DTU job creation. | Check whether the email address is proper. |

| Error code and message | When? | Remedy |
|---|---|---|
| Source, target or DSC system is not configured. | While selecting media server IP address during DTU job creation. | Please contact DTU support team. |
| Failed to prepopulate input details. Please enter data manually. | While creating consecutive DTU jobs after the first DTU job. | Please enter the details manually to proceed. Then is a problem in copying the details from one job to next job. Contact DTU support team. |
| Failed to fetch the media servers list. | While selecting media server IP address during DTU job creation | Please contact DTU support team. |
| Source-Target swap check failed! | While selecting media server IP address during DTU job creation. | Source and target systems might have been swapped. Please contact DTU support team. |
| No media servers list found or network fabric detected. | While selecting media server IP address during DTU job creation. | Problem with configuring source and target with DSC. Contact DTU support team. |
| Failed to retrieve the assessment categories. | While starting assessment or reassessment in job details page. | Contact DTU support team. |
| Failed to start assessment | While clicking on submit button of the Start Assessment or Reassessment dialog. | Contact DTU support team. |
| Please enter valid input. | While entering the assessment name to start the assessment. | Enter a valid assessment name. |
| Please enter all the inputs. | While entering details for assessment or reassessment. | Enter all the required details. |
| Error in exporting Assessment validation report. Please try later. | While clicking on download button on View Details page for the assessment report. | Contact DTU support team. |
| Error in loading assessment. Please try later. | While opening View Details page. | Contact DTU support team. |
| Failed to fetch the system details. | While opening migration details in View Details page. | Contact DTU support team |
| Error in creating a new migration. Please try later. | After clicking on Start Migration in Job Details page | Contact DTU support team. |
| Failed to resume the migration. | Migration went to a halt state and after clicking on Resume Migration in Job Details page. | Contact DTU support team. |
| Error in exporting Migration status report. Please try later. | While clicking on download button on View Details page for migration report. | Contact DTU support team. |
| Failed to fetch the migration jobs. | While clicking on the steps menu of migration in View Details page. | Contact DTU support team. |

| Error code and message | When? | Remedy |
|---|---|---|
| Failed to fetch the migration status. | While clicking on the migration details in View Details page. | Contact DTU support team. |
| Failed to fetch the error list. | While clicking on the migration errors menu of migration in View Details page. | Contact DTU support team. |
| Failed to fetch the migration status. | While clicking on the migration details in View Details page. | Contact DTU support team. |
| Failed to fetch the list of migrations. | While clicking on the history of View Details page. | Contact DTU support team. |
| Unable to connect with migration service. | While clicking on the migration details in View Details page. | Contact DTU support team. |
| Failed to fetch Latest Assessment ID. | While clicking on the View Details page. | Contact DTU support team. |

# Troubleshooting the Migration

## Resolving a Migration Problem

Any job failure during migration, causes the migration to halt.

If you need assistance, contact: DTU, Engg Support Team.

1. Go to the Migrations ⋮ > **Details** page.
2. Select **Migration Errors** then **View Diagnostics**.
3. Follow the specified steps to fix the error.
4. Check the system diagnostics on the source, target, and DSC systems to verify their health.
5. Check the logs to verify the software components status.
6. Resume migration.

## Aborting a Hung Job

If a particular job is hung, you can abort that job, continue the migration, and then submit the aborted job manually.

1. Log on to the DSC.
2. Abort the hung job:
   `dsc abort_job -n <job_name>`
   DTU continues the migration.
3. When the migration is complete, submit the aborted job:
   `dsc run_job -n <job_name>`

## Commands to Gather Diagnostic Data

All of these commands must be run from the command prompt of the specified machine. Use these commands to verify the following information:

- Whether DTU services are running or not: Run this command from the machine where DTU services are running.

  ```
  docker ps
  ```

- The DSC status: Run this command from the DSC machine.

  ```
  /etc/init.d/dsc status
  ```

- ActiveMQ status: Run this command from the DSC machine.

  ```
  /etc/init.d/tdactivemq status
  ```

- ClientHandler status: Run this command from the target machine.

  ```
  /etc/init.d/clienthandler status
  ```

- TPA REST server status: Run on source, target, and DSC machine.

  ```
  /etc/init.d/tpa-rest-server status
  ```

- Target group: Run this command from the DSC machine.

  ```
  dsc list_components -t target_group
  ```

- Media server: Run this command from the DSC machine.

  ```
  dsc list_components -t media_server
  ```

- Filebeat is running: Runs on all nodes of source, target and DSC machines.

  ```
  pcl -s "pidof filebeat"
  ```

- BARDSmain is running: Runs on all nodes of source and target machines.

  ```
  pcl -s "pidof dsmain"
  ```

- DSA job status: Run this command from the DSC machine.

  ```
  dsc job_status –n <job_name>
  ```

- DSA job status log: Run this command from the DSC machine.

  ```
  dsc job_status_log –n <job_name>
  ```

## Error Codes during Migration and Post-Migration Validation

| Error code and message | When? | Remedy |
|---|---|---|
| 2325: Unable to get all hostnames in <*source/target /DSC*> database system. | During health check processing of the migration job to see whether filebeat is running on all the nodes of the source, target and DSC systems. | Check whether tpa-rest-server is running on all the nodes of the systems supplied. If everything looks fine and tpa-rest-server is running properly, contact DTU team. |
| 2326: Unable to reach FileBeat in <*source/target/ DSC*> system. | During health check processing of the migration job if filebeat is not installed or not running on some node of the source, target or DSC system. | This is a DTU deployment problem. Check whether filebeat is installed on all the nodes of source, target and DSC systems. |
| 2330: Unable to reach <*source/target*> Logstash. | During health check processing of the migration job if Logstash of source or target is not working. | This is a DTU deployment problem. Check whether Logstash service for source and target are up and running are not. |
| 2331: Unable to get DBS version of <*source/ target*> system. | During health check processing of the migration job, if unable to check if database version is as expected on the <*source /target*> systems. | Tpa-rest-server may be down. Please check and bring it up. |
| 2333: Service <*service_ name*> health check failed. | During health check processing of the migration job, if any of the DTU services is down. | Bring the specified DTU service up. |
| 2334: Required env variables not found. | During health check processing of the migration job, if any of the required environment variable for Logstash is missing. | This is a DTU deployment problem, please contact DTU team. |
| 2401: Migration name <*migration_name*> is already used. Please try a different name. | When user tries to start migration. | Enter a different migration job name and start the migration. |
| 2812: Failed while estimating migration time due to unknown error. | When a running migration job contacts premigration assessment service to get time estimation for migration. | Follow the remedy specified. If all components are healthy then, this may be due to an internal error in premigration assessment service. Please contact DTU team. |
| 2816: Run job failed for job: <*job_name*>. | When DSA job is submitted by migration service for running. | Follow the remedy specified. If all components are healthy then, this may be due to an internal problem in migration service or DSA. Please contact DTU team. |
| 2821: EDR service is unreachable. Migration input registration failed. | When migration services tries to initiate or pass migration job | Check whether error detection and recovery service is up and running. |

| Error code and message | When? | Remedy |
|---|---|---|
| | details to error detection and recovery service. | |
| 2825: Filebeat agent initialization failed on source system. | When migration service tries to configure Filebeat on the source system, tpa-rest-server on the source tries to start Filebeat on all the nodes of the source system. | This may be a deployment problem. Please contact DTU team. |
| 2826: Filebeat agent initialization failed on target system. | When migration service tries to configure Filebeat on the target system, tpa-rest-server on the target tries to start Filebeat on all the nodes of the target system. | This may be a deployment problem. Please contact DTU team. |
| 2827: Filebeat agent initialization failed on DSC system. | When migration service tries to configure Filebeat on the DSC system, tpa-rest-server on the DSC tries to start Filebeat on all the nodes of the DSC system. | This may be a deployment problem. Please contact DTU team. |
| 2828: Parallel migrations are not allowed. Migration with migration job name <*migration_job_name*> is running. | When user tries to submit a new migration job when already a migration job is running. | Only one instance of migration can be run at a given time. Parallel migrations are not allowed. |
| 2832: Error occurred while getting DBS version information. | During health check process of migration job.<br>Migration checks if supported version of DBS is running on source and target. | Check whether tap-rest-server is up and running to retrieve the required information. |
| 2834: DBS version compatibility with DSC failed. | During health check process of the migration job.<br>DSC version used does not support source or target database version for migration. | This is a deployment issue. Please install appropriate version of DSC. |
| 2835: Unsupported DBS release version for migration. | During health check process of the migration job.<br>Database version of source or target system is not supported by DTU application. | Upgrade the database version to DTU supported version and then start the migration. |
| 2836: Internal server error. | While migration is in progress. | Unknown internal server problem in migration service. Please contact DTU team. |
| 2842: Parallel migrations are not allowed. DTU Job <*dtu job name*> is already running. | When user tries to start migration while another migration is running in any of the DTU jobs. | Wait for the currently running migration to complete and then start this migration. |

| Error code and message | When? | Remedy |
|---|---|---|
| 2845: Unable to start the migration. Reason - <*error message*>. | When user tries to start migration. | Unknown internal server problem in migration service. Please contact DTU team. |
| 2847: DTU job state update failed. Please contact support engineer. | When migration service calls premigration setup service to update DTU job state. | Unknown internal server problem in migration service. Please contact DTU team. |
| 2848: DTU job state update failed due to pre-migration setup service unavailable, retrying. | When migration service calls premigration setup service to update DTU job state. | Follow the remedy specified. If all components are healthy, then this may be due to some internal error in premigration setup service. Please contact DTU team. |
| 2850: DIP job is taking longer time than estimated. Please wait, analyzing it for details. | When DIP job is taking more time than estimated. | Follow the remedy specified. If all components are healthy then, this may be due internal server problem. Please contact DTU team. |
| 2851: Slow data transfer rate detected. Please wait, analyzing it for details. | When data transfer rate of the DSA job drops significantly. | Follow the remedy specified. If all components are healthy then, this error may be transient and may get cleared automatically. Please contact DTU team if the error persists. |
| 2852: No data transfer detected since last 20 minutes. Please wait, analyzing it for details. | When there is no data transfer of a DSA job from last 20 minutes. | Follow the remedy specified. If all components are healthy then, this error may be transient and may get cleared automatically. Please contact DTU team if the error persists. |
| 2853: Unknown migration error. Reason - <*error message*>. | While migration is in progress. | Unknown internal server problem in migration service. Please contact DTU team. |
| 2909: PDE state is down on <*source/target /DSC*> (<*system_name*>) database system. | While migration is in progress. | Bring database up on the specified system. |
| 2910: Logons are disabled on <*source/ target*> (<*system_name*>) database system. | While migration is in progress. | Enable logons on the specified system. |
| 2911: <*source/target*> (<*system_name*>) host not reachable. | While migration is in progress. | Tpa-rest-server may be down on the specified system. Bring the tpa-rest-server up. |
| 2916: Service discovery failed for <*DTU service_name*>. | During health check process of the migration service. | Check whether the specified DTU service is up and running or not. |
| 2920: Pre-migration setup failed due to <*specific_reason*>. | When migration service calls premigration setup service to | Follow the remedy specified. If all components are healthy, then this may be due to some internal error |

| Error code and message | When? | Remedy |
|---|---|---|
| | configure system or prepare migration plan. | in premigration setup service. Please contact DTU team. |
| 2924: Unable to fetch (map) JSON string from Java object. | While migration is in progress. | Follow the remedy specified. If all components are healthy, then, this may be due to internal error in migration service. Please contact DTU team. |
| 2927: Unable to restart the service on crash. Issue: <*reason*>. | While migration is in progress. One of the DTU services crashed and didn't restart. | One of the DTU services has a resilience problem. Please contact DTU team. |
| 2928: Health for <*DTU component*> failed. Message: <*failure detail*>. | During health check. | The specified DTU component is down, please check and bring it up. |
| 2929: Enabling DBC logons failed on target machine. | During migration process enabling DBC logons on the target machine failed. | Check whether tpa-rest-server is down on the target machine. If tpa-rest-server is up please contact DTU team. |
| 2933: Setting 432 dbscontrol flag failed on target machine. | When tpa-rest-server is down on target control node. | Check whether tpa-rest-server is running on all the nodes of the systems supplied. If everything looks fine and tpa-rest-server is running properly, contact DTU team. |
| 4000: Post migration validation summary API failed. Reason: <*reason*>. | When post migration validation is complete, and user tries to get the post migration validation summary report. | Follow the remedy specified. If all components are healthy then, this may be due to an internal server problem. Please contact DTU team. |
| 4001: Post migration validation detailed report API failed. Reason <*reason*>. | When post migration validation is complete, and user tries to get the post migration validation detailed report. | Follow the remedy specified. If all components are healthy then, this may be due to an internal server problem. Please contact DTU team. |
| 4002: Validation reports are not available while migration is running. | When migration is still in progress, and user tries to check validation report. | User can check the post migration validation report once the validation is completed after migration. |
| 4003: Enabling all logons failed on target machine. | When migration service tried to enable all logons on the target machine. | Check whether tpa-rest-server is down on the target machine. If tpa-rest-server is up please contact DTU team. |
| 4101: Error occurred while configuring source and target machines with DSC. | When premigration setup service tries to configure source and target systems with DSC. | Follow the remedy specified. If all components are healthy then, this may be due internal server problem. Please contact DTU team. |
| 4102: Error occurred while creating DSA jobs. | During migration process when premigration setup service tries to create the migration plan. | Follow the remedy specified. If all components are healthy then, this may be due internal server problem. Please contact DTU team. |

| Error code and message | When? | Remedy |
|---|---|---|
| 4103: Error occurred while getting migration time estimation from assessment. | When migration service tries to get the time estimation for migration from premigration assessment service. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4105: Error occurred while running migration jobs. | When migration is in progress and during execution of the DSA jobs. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4107: Error occurred while analysing partially migrated jobs. | When migration service is analysing the failed DSA jobs. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4108: Error occurred while creating delta jobs for partially migrated jobs. | When migration service tries to create new job for the failed DSA job using premigration setup service. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4109: Error occurred during post migration validation. | When post migration validation is running after the migration. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4110: Error occurred while aborting migration. | When user tries to abort a migration job. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4111: Error occurred in migration. | When migration is in progress. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4112: DSC did not report any error message. | When the migration is in progress and DSA job execution failed, but migration service did not receive any error message from DSC. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4113: Error occurred during health check of source and target machines. Reason : <*reason*>. | During health check process of the migration service. | Check whether tpa-rest-server is down. |
| 4114: Reconfig system failed. Reason : <*reason*>. | When one of the nodes goes down on source or target, and migration service tries to reconfigure the system with DSC. | Follow the remedy specified. If all components are healthy then, this may be due to internal server problem. Please contact DTU team. |
| 4118: Unable to create DSA Job. | While migration is in progress. | Follow the remedy specified. If all components are healthy then, this may be due internal server problem. Please contact DTU team. |

| Error code and message | When? | Remedy |
|---|---|---|
| 4119: DTU job object list validation failed. | When user tries to start migration. | Follow the remedy specified. |
| 4120: Unable to create delta jobs plan. Reason - <*message*> | While migration is in progress. | Follow the remedy specified. If all components are healthy then, this may be due internal server problem. Please contact DTU team. |
| 4121: <*missing objects count*> Objects <*missing objects list*> found missing on source database. Possibly these objects were removed after the last successful assessment. | When user tries to start migration. | Follow the remedy specified. |

## Error Codes during Error Detection and RCA

| Error code and message | When? | Remedy |
|---|---|---|
| 2327: Service <*service_name*> health check failed. | During health check process of migration.<br>Migration service calls error detector service for health check, which in turn checks its dependent services like Logstash and Kafka. | If any dependent service is down, please check and bring the dependent service up. |
| 2329: EDR for given migration job name is running. Please abort and then delete. job name : <*job_name*>. | User tries to delete a migration job while error detector service is processing a migration failure. | User must first abort the migration job and then delete the migration job. |
| 2333: EDR failed to provide object error remedies. | Migration passed an error code for object error that is not handled by error detector and root cause analysis service. | This is an unhandled case. Please contact DTU team. |
| 3003: Unable to reach <*source/target*> Logstash. | During health check process of migration.<br>Source or target Logstash is not reachable. | Specified Logstash is down. Bring the Logstash up. |
| 3004: Logstash environment variables not defined. | During health check process of migration. | Deployment issue. Please contact DTU team. |
| 3105: Internal Error: Invalid type cast. | During root cause analysis of migration failure. | This is a code bug in root cause analysis service. Please contact DTU team. |
| 3006: Rest server returned null response. | During root cause analysis of any failures.<br>DBS API returned NULL response. | Try to run the failed DBS API manually to get proper response. |

| Error code and message | When? | Remedy |
|---|---|---|
| | | If still problem persist contact DTU team. |
| 3007: Rest server returned error response. | During root cause analysis of any failures.<br>DBS API returned error response. | Run the failed DBS API manually to get proper response. If problem persists contact DTU team. |
| 3008: RCA is unable to determine the issue due to internal error. | During root cause analysis of migration failure.<br>If any of the analysers fail. | Possible internal code problem, contact DTU team. |
| 3011: Rest server timed out. RCA is unable to determine the issue. | During root cause analysis of migration failure if call to any of the analyser times out. | Try to do the analysis manually for the analyser that timed out and did not run. |

## Error Types for Which Migration Calls EDS

| Error Type | Description |
|---|---|
| Health Check Error | Error happened during health check of all the components involved during migration |
| Config System Error | Error happened during configuration of source and target with DSC |
| Job Submission Error | Error happened during submission of DSA job |
| Job Execution Error | Error happened during execution of DSA job |
| Object Error | Error happened for few objects in a database during DSA job execution |
| Validation Error | Error happened during validation of migrated data using PMV |
| Slow Down | Migration detects slowness in data migration |
| Not Responding Error | When migration don’t receive DSA job status from DSC |
| DIP Error | Error happened during execution of DIP scripts |

## Errors: List of Analyzers Used by RCA

| Serial. No | Analyzer Name | Purpose | Used in error type |
|---|---|---|---|
| 1 | Active MQ status | Checks activeMq status. | All error types |
| 2 | AMQBlockedMessages | Checks how many messages are in AMQQueue. More than 100 represents an issue. | All error types |

| Serial. No | Analyzer Name | Purpose | Used in error type |
|---|---|---|---|
| 3 | Ampload | Checks the amp saturation on given machine. | Slowness |
| 4 | Bynet | Checks if all machines are configured with same bynet version | Job execution |
| 5 | ClientHandlerStatus | Checks ClientHandler status. | All error types |
| 6 | CnsScreen | Checks if any utilities are running in CNSScreen. | Slowness |
| 7 | CpuUtilization | Checks the CPU utilization for a given machine. Returns the top most CPU consuming processes if CPU use is more than 95%.<br>Check these high consuming processes and take action to lower CPU consumption. | Slowness |
| 8 | DatabaseStatus | Checks if JDBC connection to database is working. | All error types |
| 9 | DSCStatus | Checks DSC status. | All error types |
| 10 | BarDsmainLeftOverProcess | Checks if BarDSMain process is running on a given system. Also checks for leftover processes that are still running. | Job execution |
| 11 | FreeCylinder | Checks if there are enough free cylinders in system. | Slowness |
| 12 | Gateway | Checks how many PE and GateWay sessions are currently running. Verifies if we exceed maximum limit of sessions.<br>• Max PE: 120<br>• Max Gateway: 600 | Slowness |
| 13 | Locks | Checks for any pending locks in the system. | Slowness |
| 14 | PartitionsStatus | Reports if all partitions are busy. | Job execution |
| 15 | MailboxStatus | Checks if any mailbox is hung. | Slowness |
| 16 | PumaTAXStatus | Gives information about problematic processes running on a machine. | Slowness |
| 17 | PumaCVStatus | Identifies problematic AMPs, which might be hung. | Slowness |
| 18 | RollbackStatus | Checks if any rollbacks are running in the system. | Slowness |
| 19 | SessionStatus | Identifies any problematic sessions. | Slowness |

| Serial. No | Analyzer Name | Purpose | Used in error type |
|---|---|---|---|
| 20 | VConfigGdoStatus | Verifies presence of `vconfig.gdo` file. | Slowness |
| 21 | VprocStatus | Checks Vproc (PE/AMP) status and reports any down Vprocs. | Job execution |
| 22 | NtpDrift | Checks for NTP drift between source, target, and DSC machine. | All error types |
| 23 | SlowLun | Checks if any disks are running slow. | Slowness |
| 24 | NodesOnBynetAnalyzer | Checks if all the nodes in system are connected to bynet. | Job execution |
| 25 | NodeStatusAnalyzer | Checks tap (PDE/DBS) status. | All error types |
| 26 | ObjectErrorDefaultAnalyzer | Takes a database error code and provides its remedy. | Object error |
| 27 | JobSubmissionIssueAnalyzer | Checks if there are any issues related to Component configuration. | Job submission |
| 28 | StoppedProcessAnalyzer | Reports any stopped processes. | Slowness |
| 29 | MediaServerOfflineAnalyzer | Checks ClientHandler and target group status. | Slowness |

# Additional Information

## Changes and Additions

| Date | Release | Description |
|---|---|---|
| September 2020 | 1.3 | Added information on the following<br>• phone notifications.<br>• telemetry<br>• block level compression<br>• Skip Stats Collection<br>• Skip Join/Hash Index |
| August 2020 | 1.2.1 | • Added information on the handling of empty databases in the include list<br>• Clarified that Teradata Database 16.00 and 16.10 cannot be used as the source database<br>• Moved time zone string set on target from blocker to warning |
| June 2020 | 1.2 | • Added selective migration, which supports the ability to migrate data in phases over a period of time<br>• Added the ability to receive email notifications of the migration progress |
| March 2020 | 1.1 | Added ability to exclude databases from the migration. |
| December 2019 | 1.0 | Initial release of Data Transfer Utility (DTU) |