VERTICA

A Deep Dive into the

Vertica Management Console Enhancements and Roadmap

Bhavik Gandhi, Vertica MC Developer
Natalia Stavisky, Vertica MC Developer

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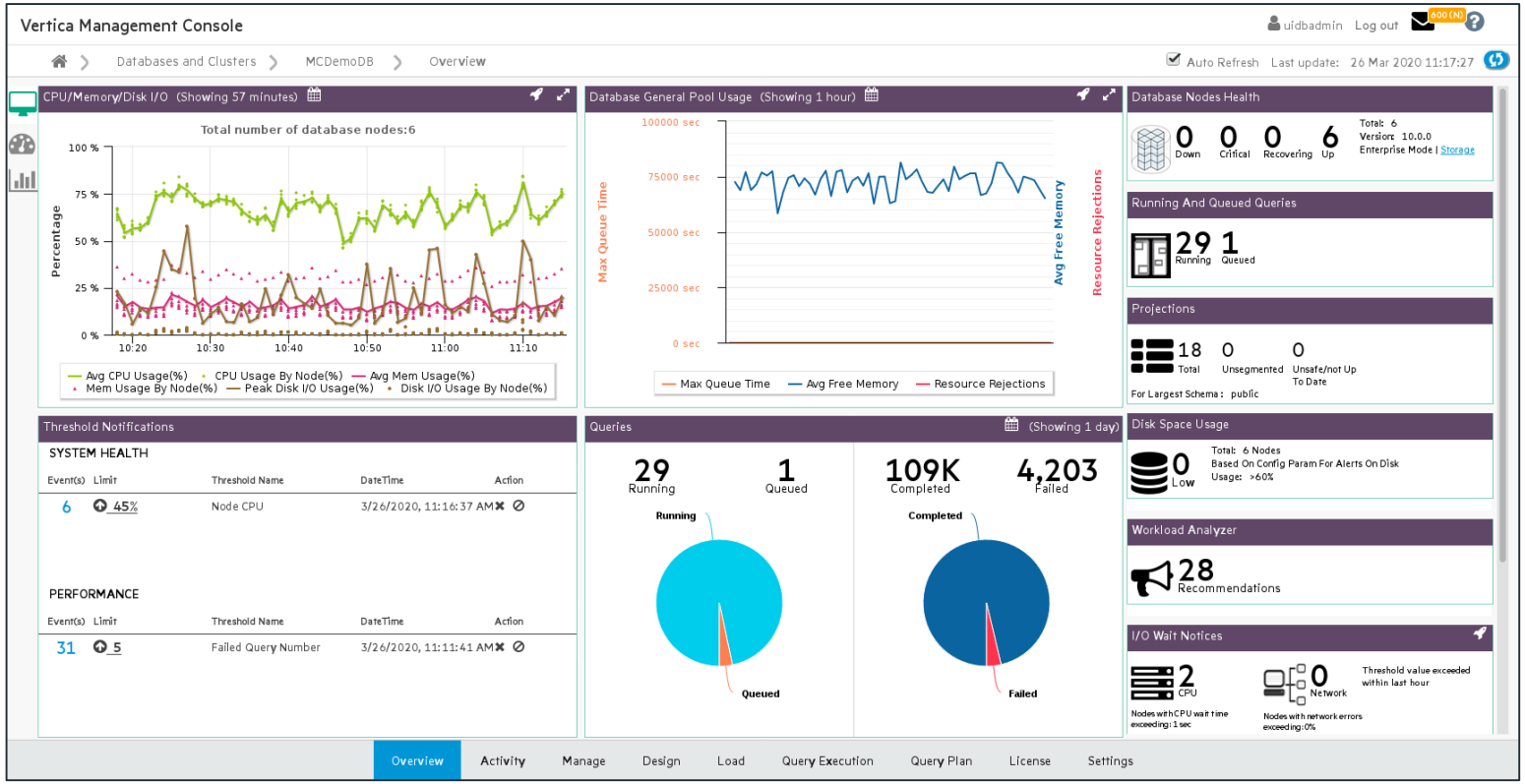
Overview

- Introduction
- Management Console Benefits
  - When queries run too long
  - When alerts are received via email
- Vertica in Eon Mode
  - Provision and revive
  - Manage subclusters
  - Understand your depot
- Management Console Roadmap



Introduction

Bhavik Gandhi, Vertica MC Developer

Vertica Management Console (MC)

- Provisioning a new Vertica cluster?
- Understanding the database workload by monitoring queries?
- Balancing resource pools?
- Setting thresholds and alerts?

The Vertica Management Console is your answer.

Vertica Management Console (MC)

Used by

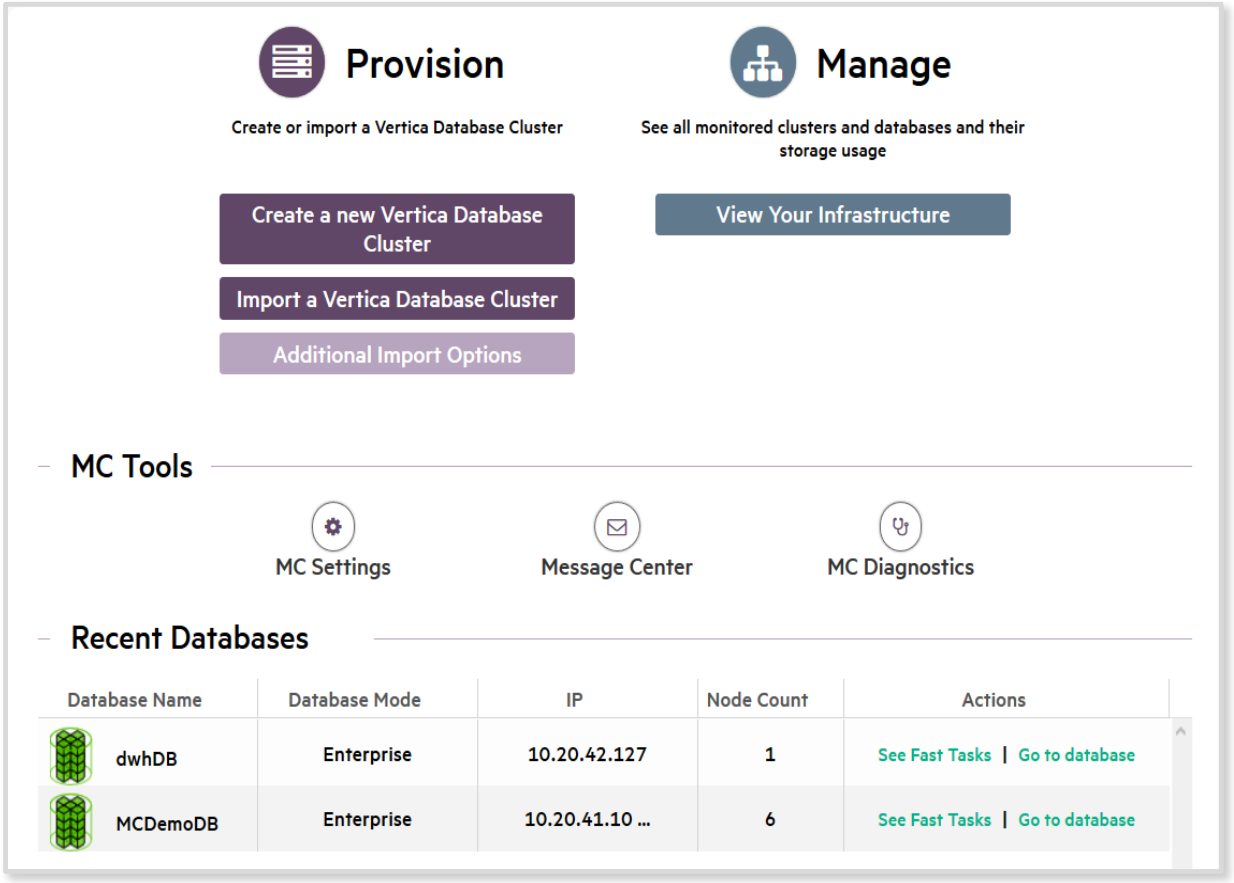
- IT/DB Admins

In both

- Eon Mode
- Enterprise Mode

For

- Provisioning
- Monitoring
- Tooling
- Much More…



Management Console Benefits

Management Console Benefits

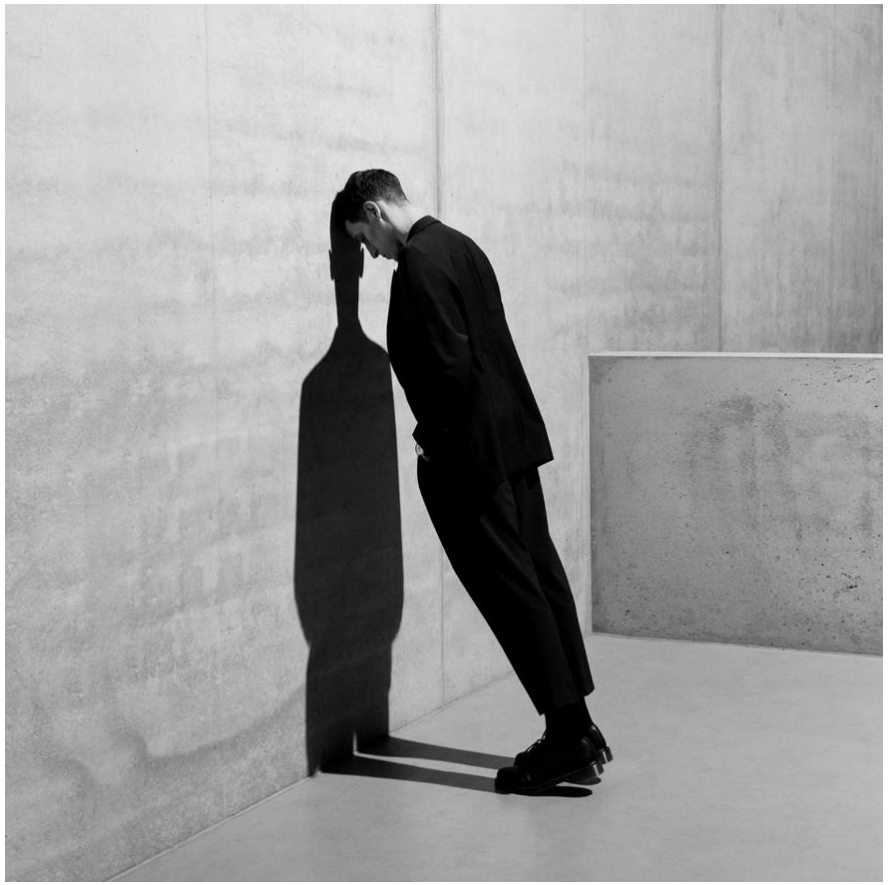
- Optimize resource pool usage
- Help identify critical conditions
- Alert on threshold triggers

Target Causes of System and Workload Performance Problems

Scenario 1: Queries running too long

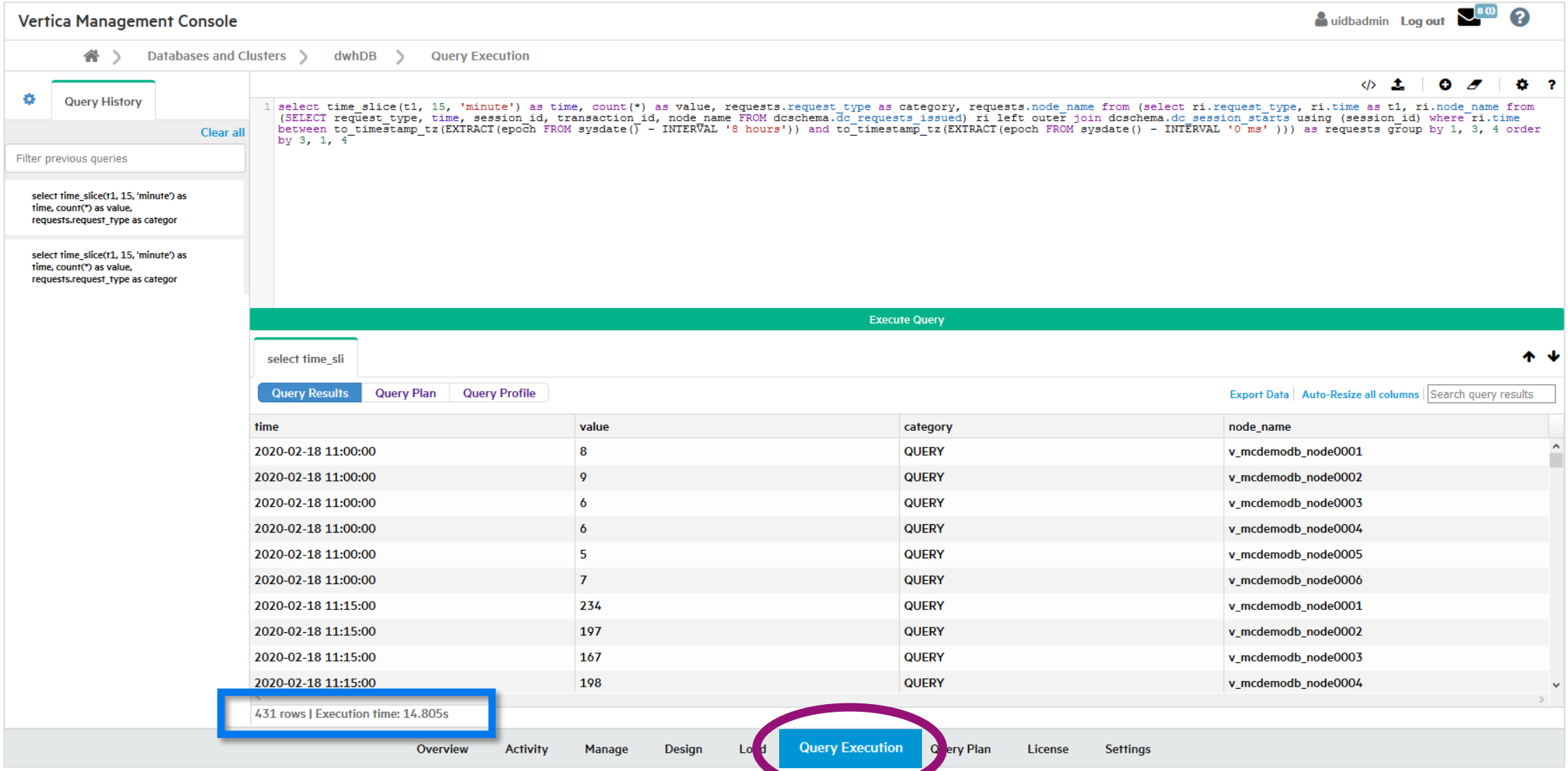
Scenario 2: Alerts received in email

- Resource rejections
- Excessive number of query failures



Scenario 1:
Queries running too long

Query Executes in 14.8 Seconds



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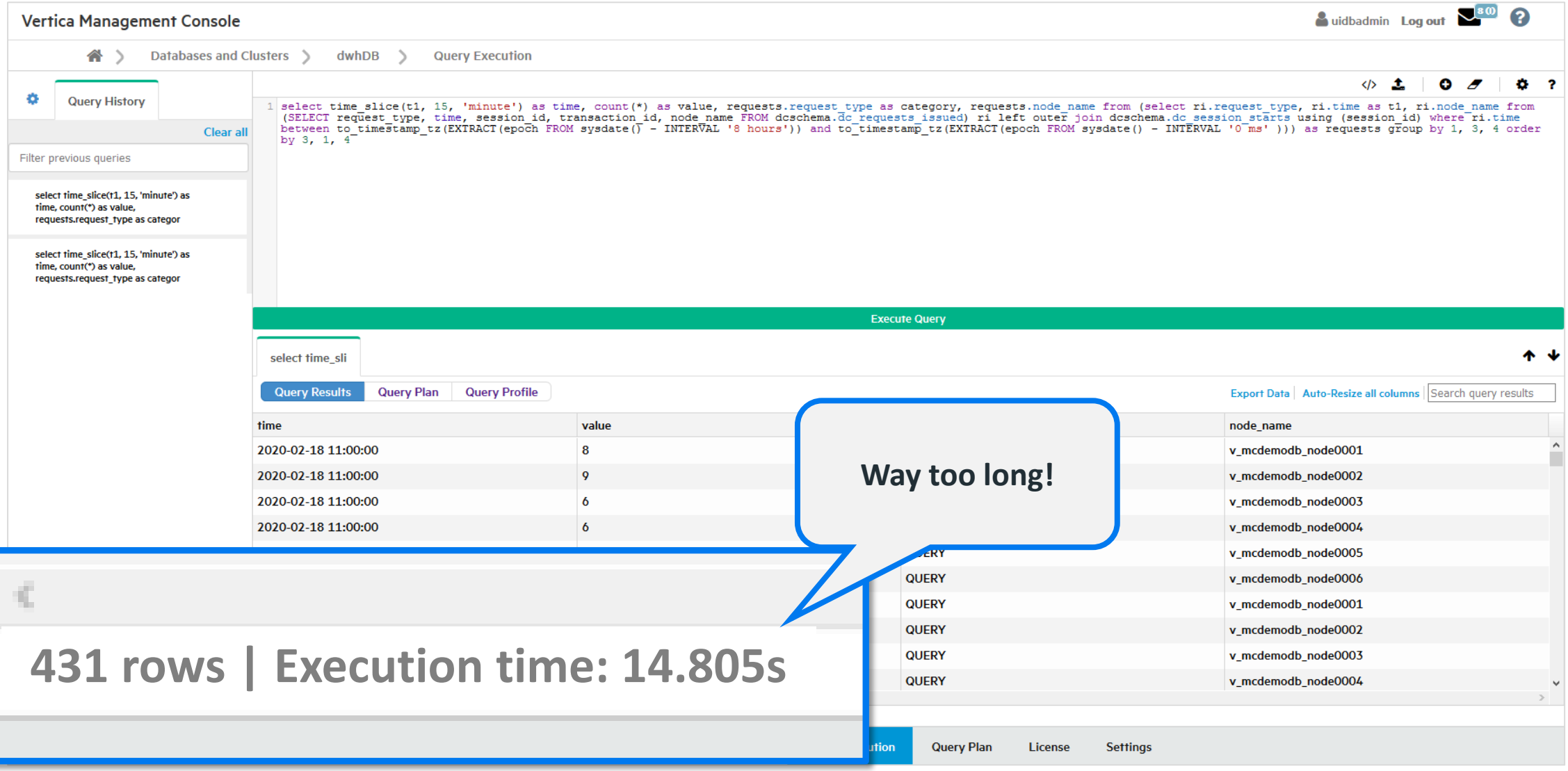

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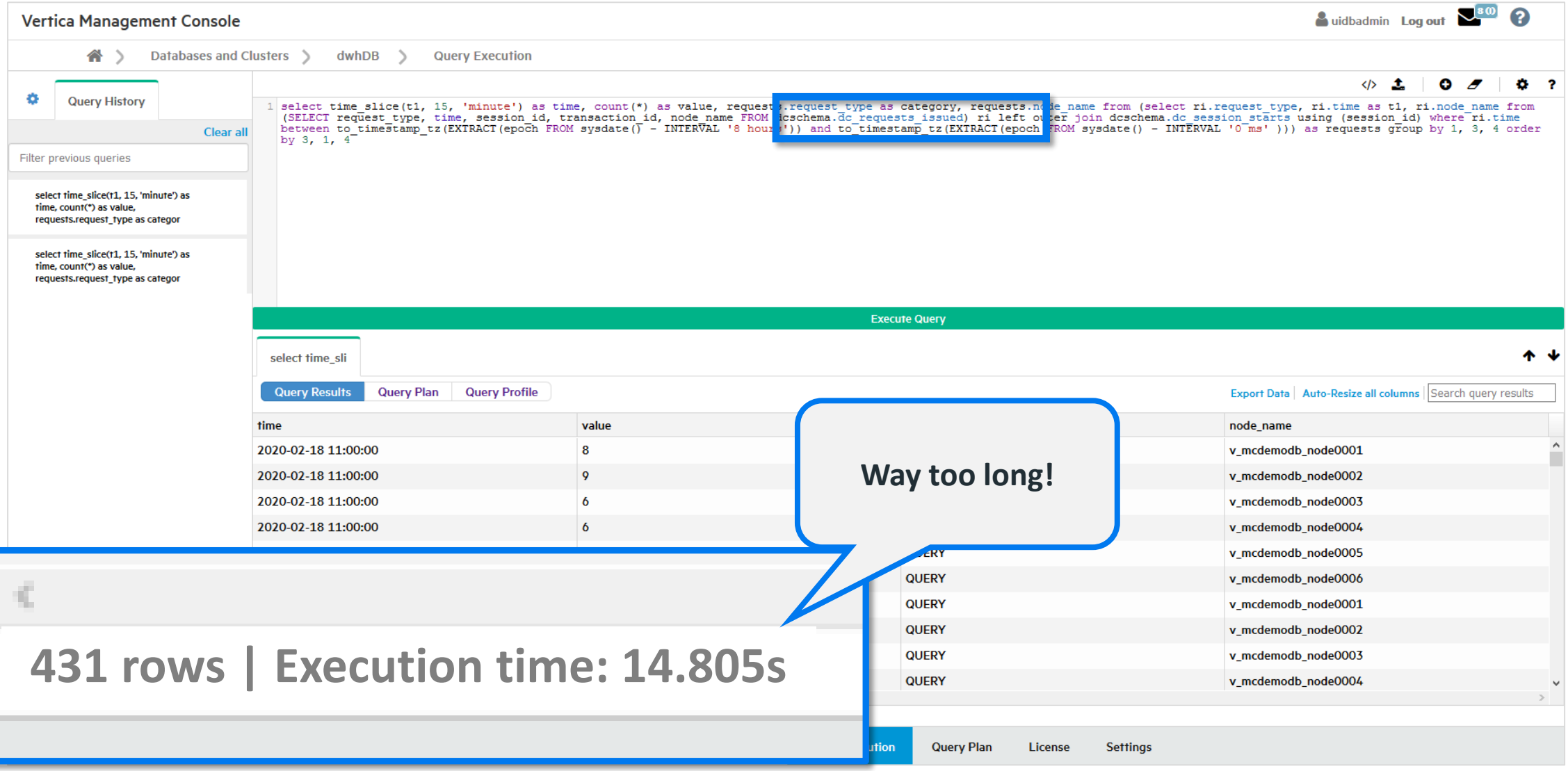

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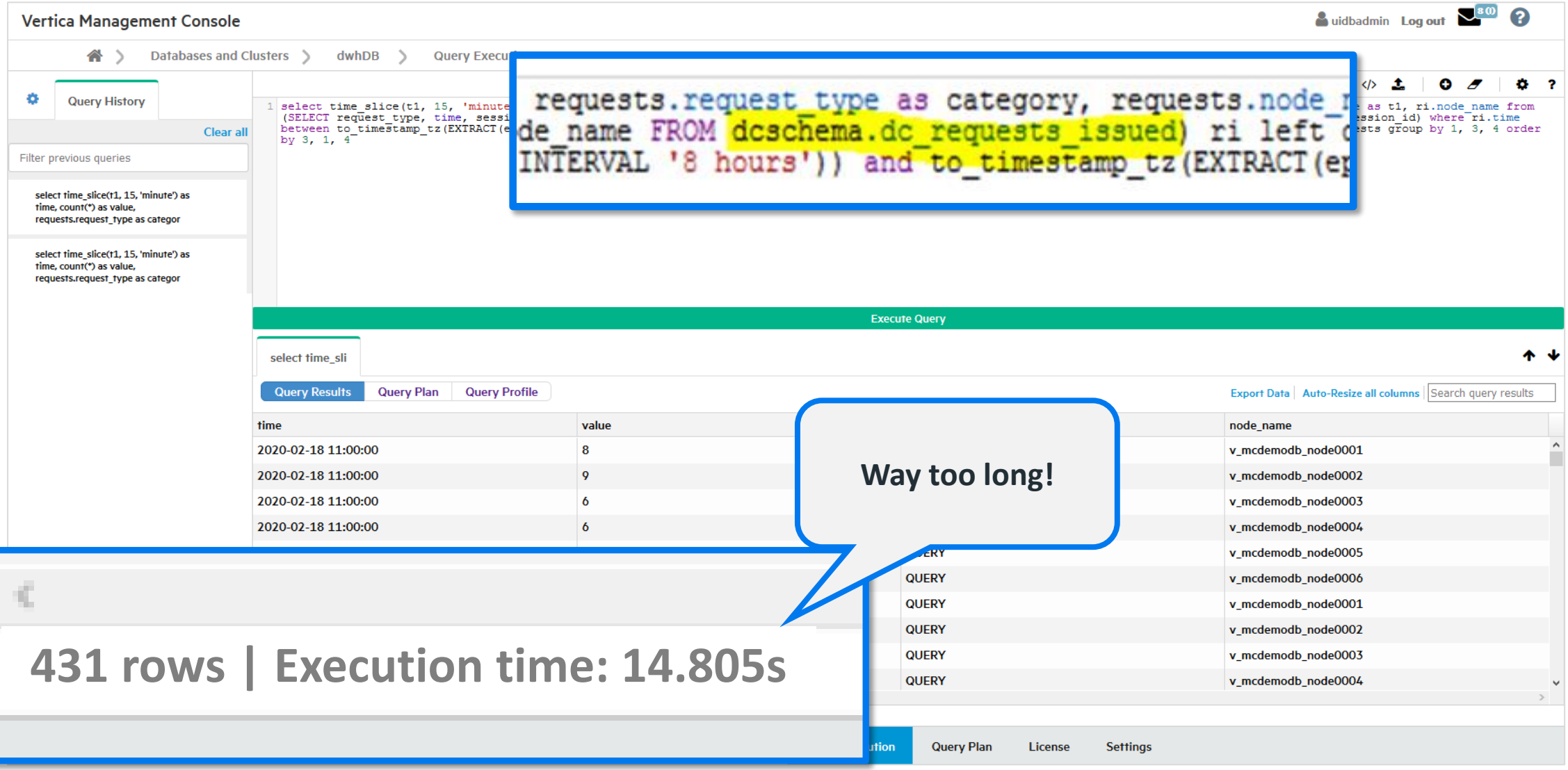
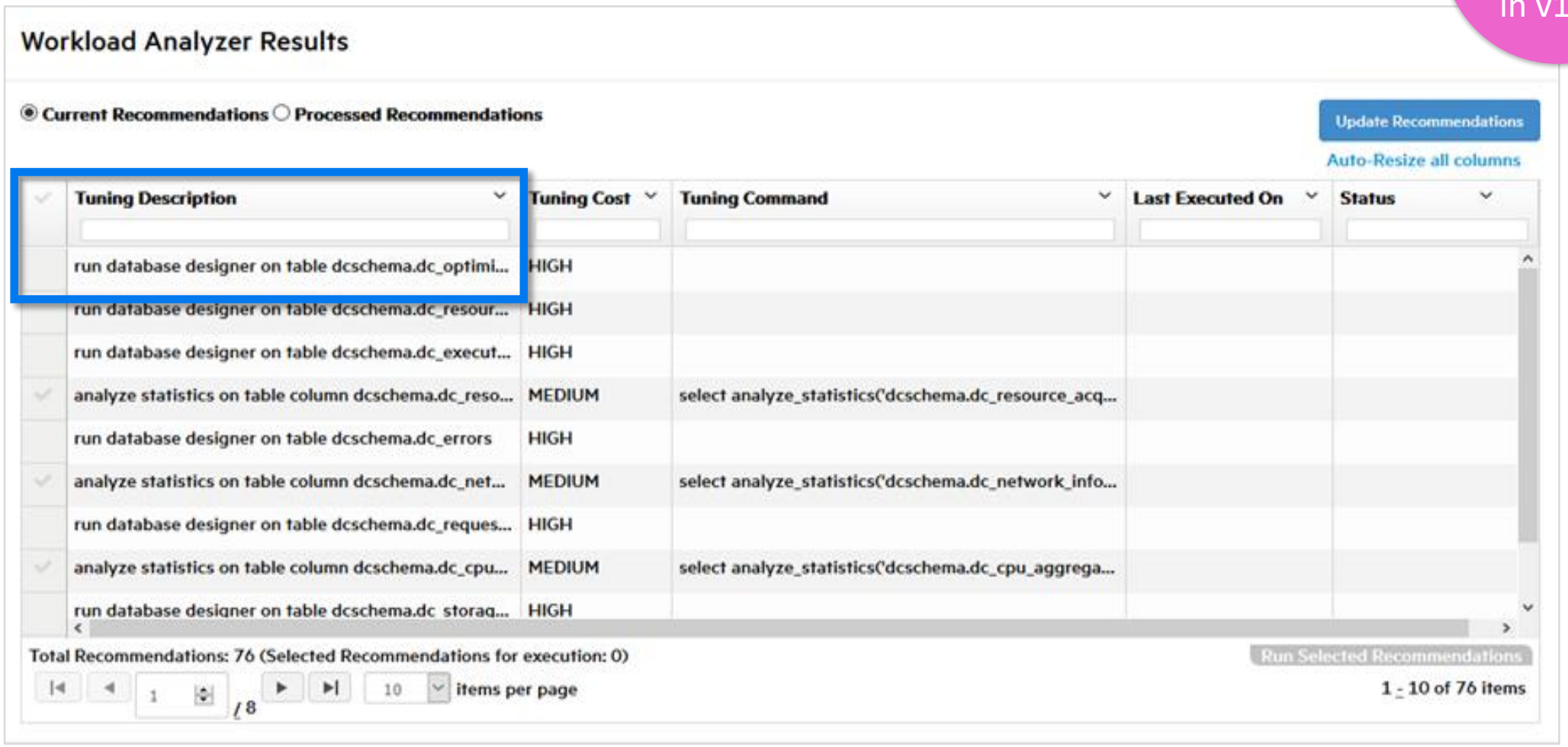


Using Workload Analyzer Recommendations

Improved in v10.0



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Using Workload Analyzer Recommendations

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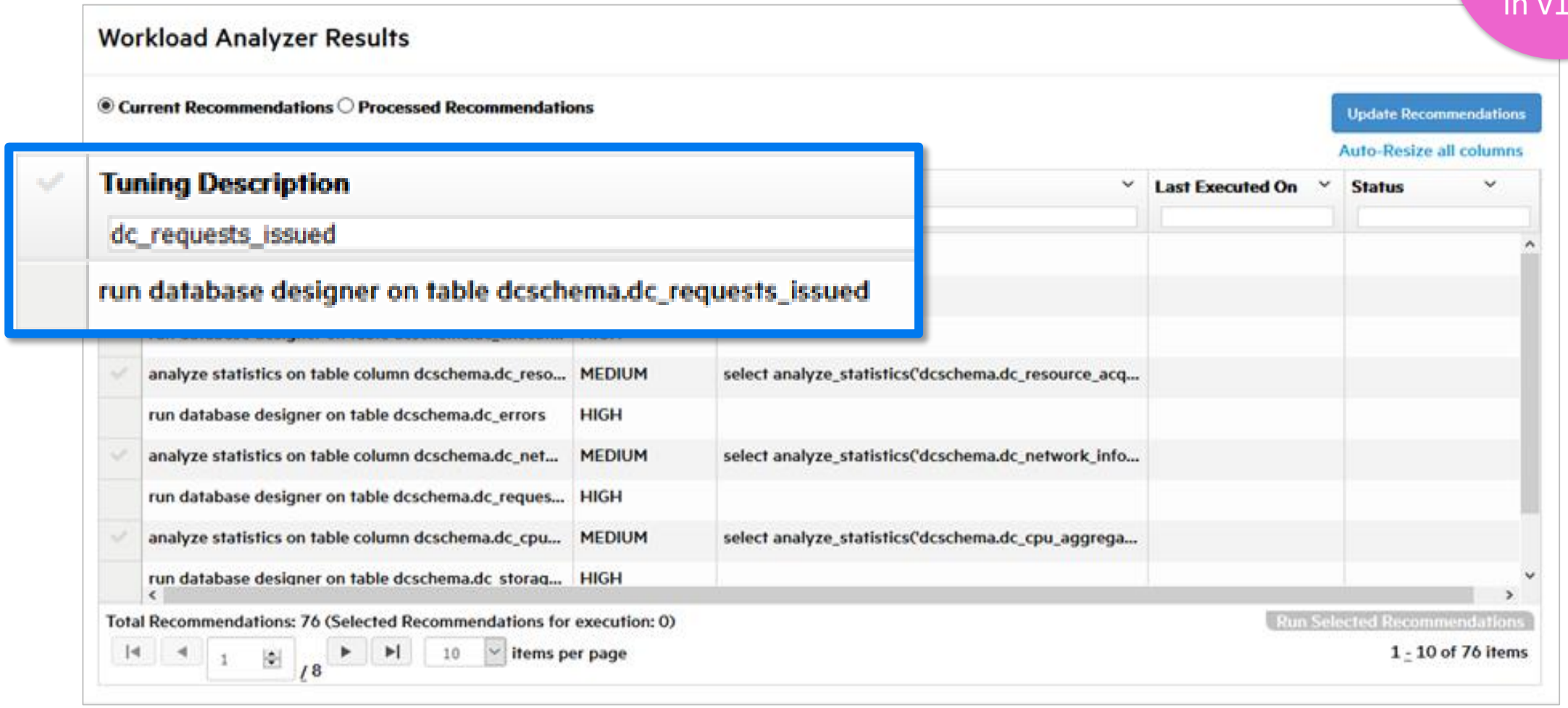

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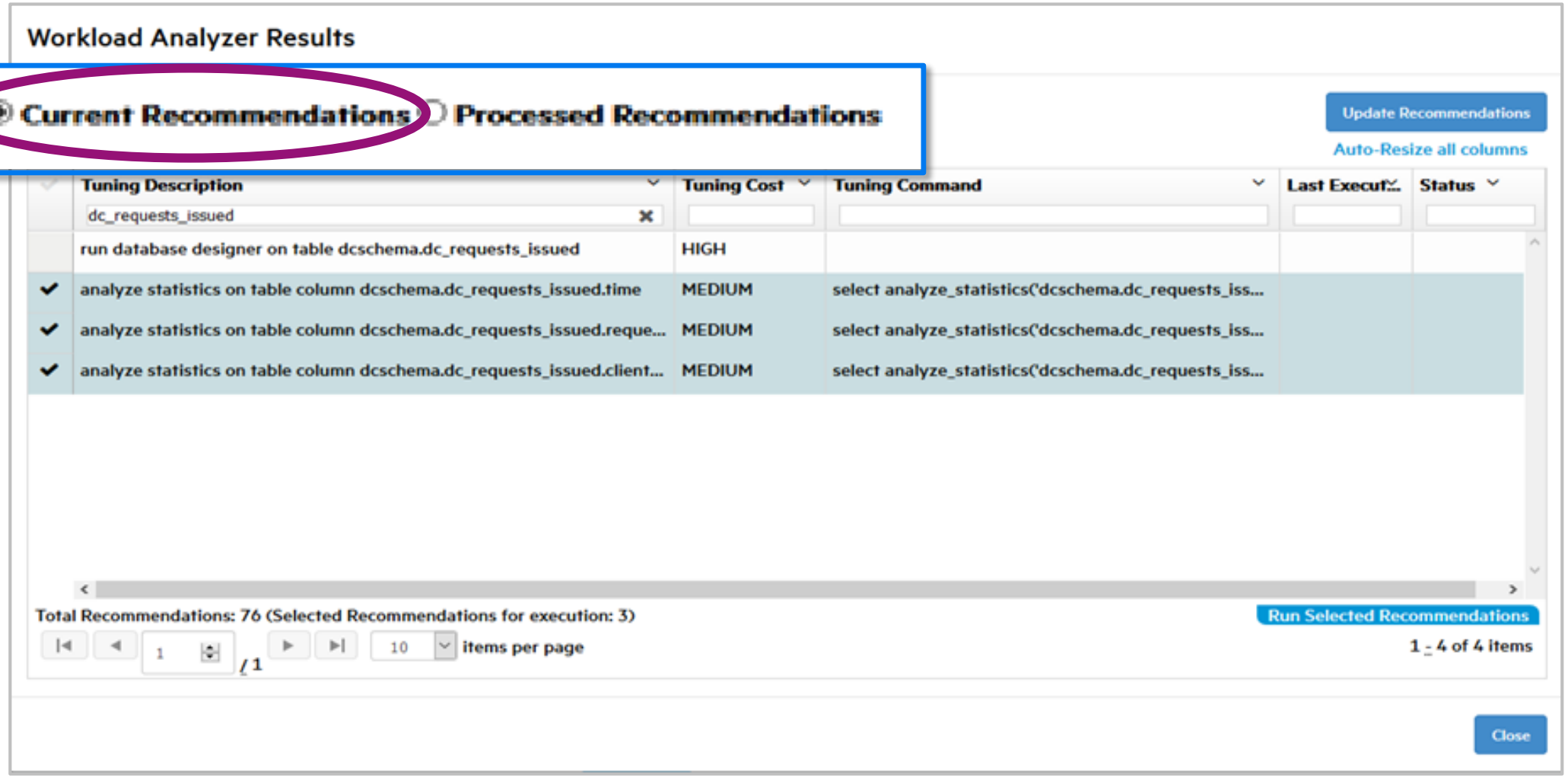
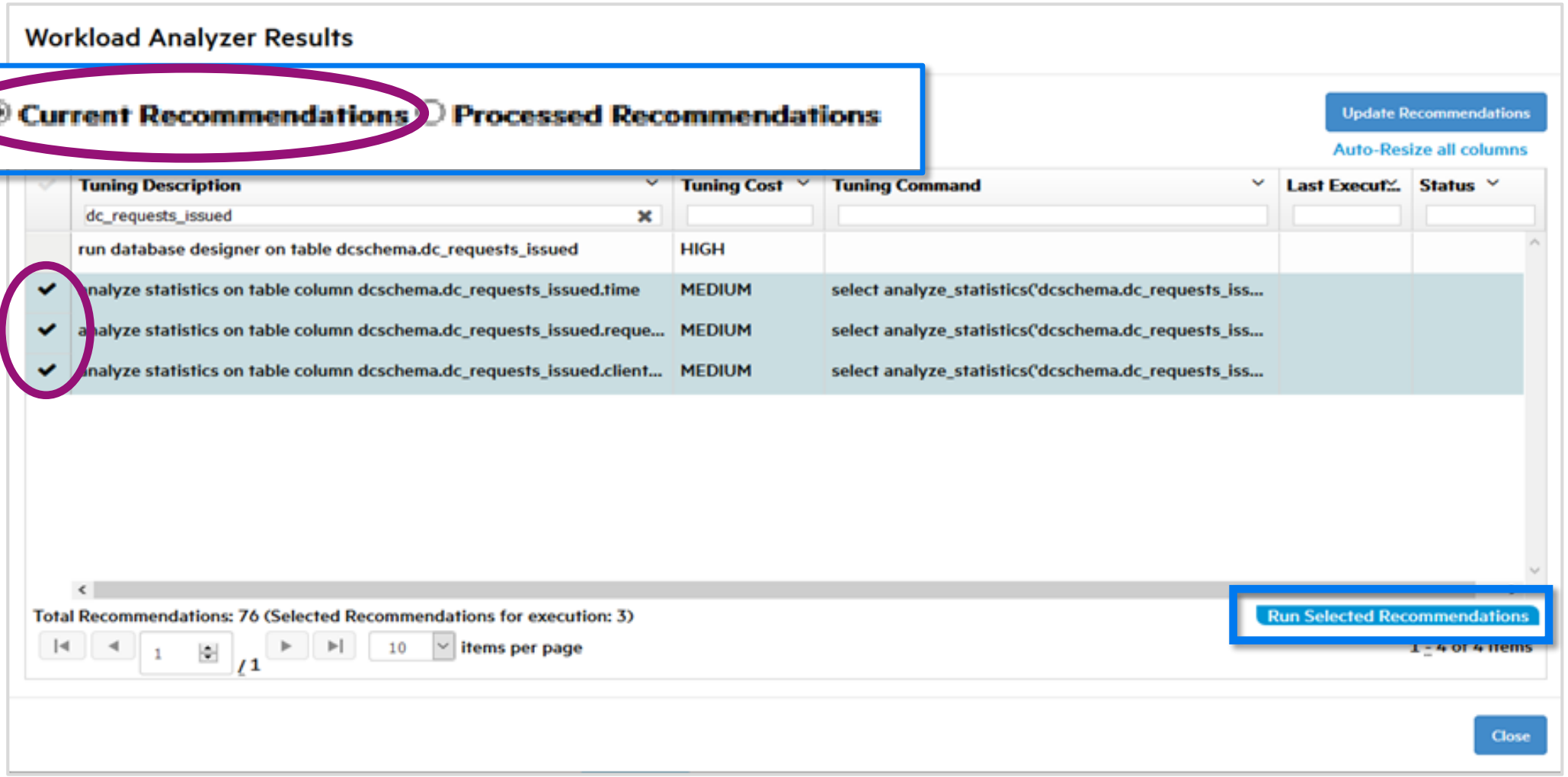
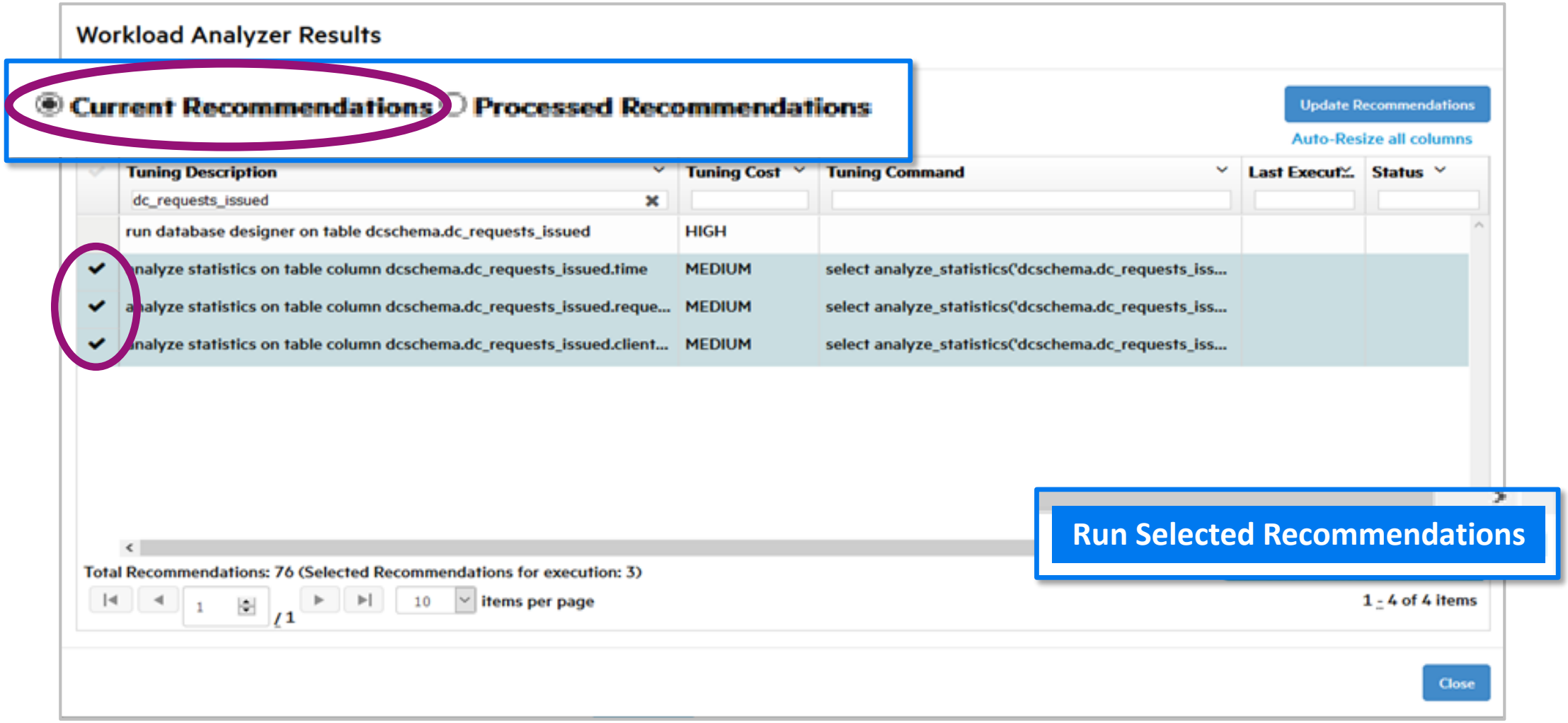


Using Workload Analyzer Recommendations



Using Workload Analyzer Recommendations



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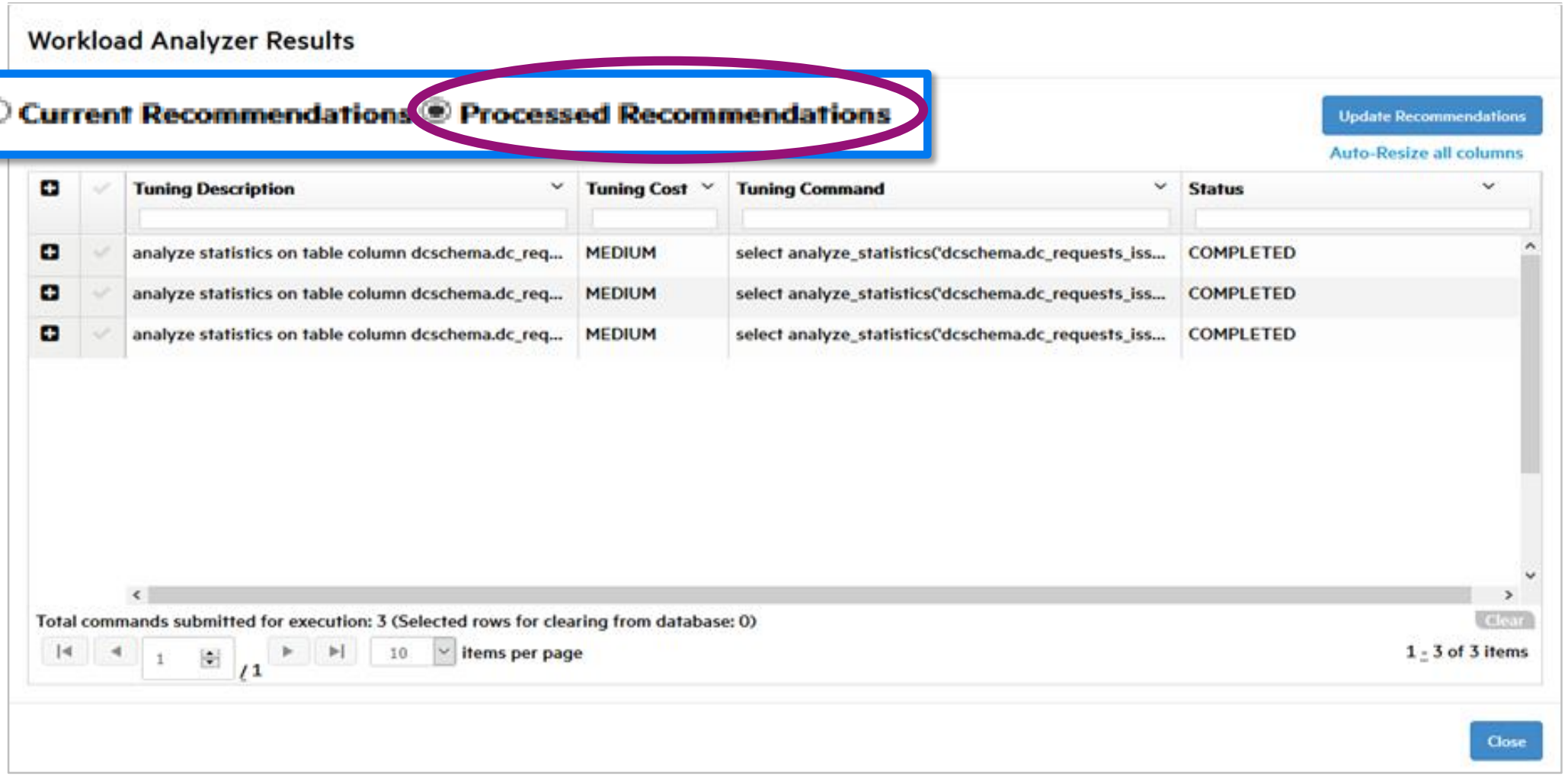
Using Workload Analyzer Recommendations



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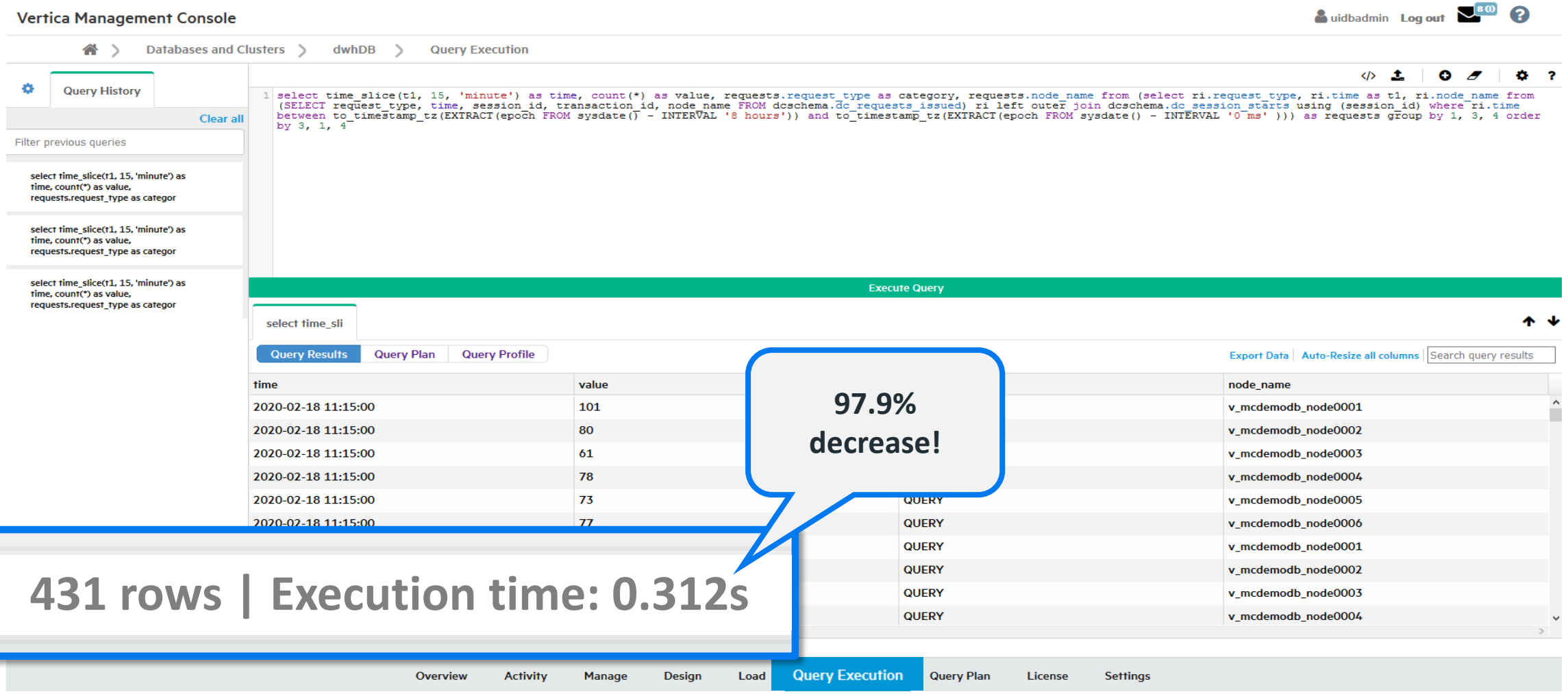
Query Executes in 0.3 Seconds



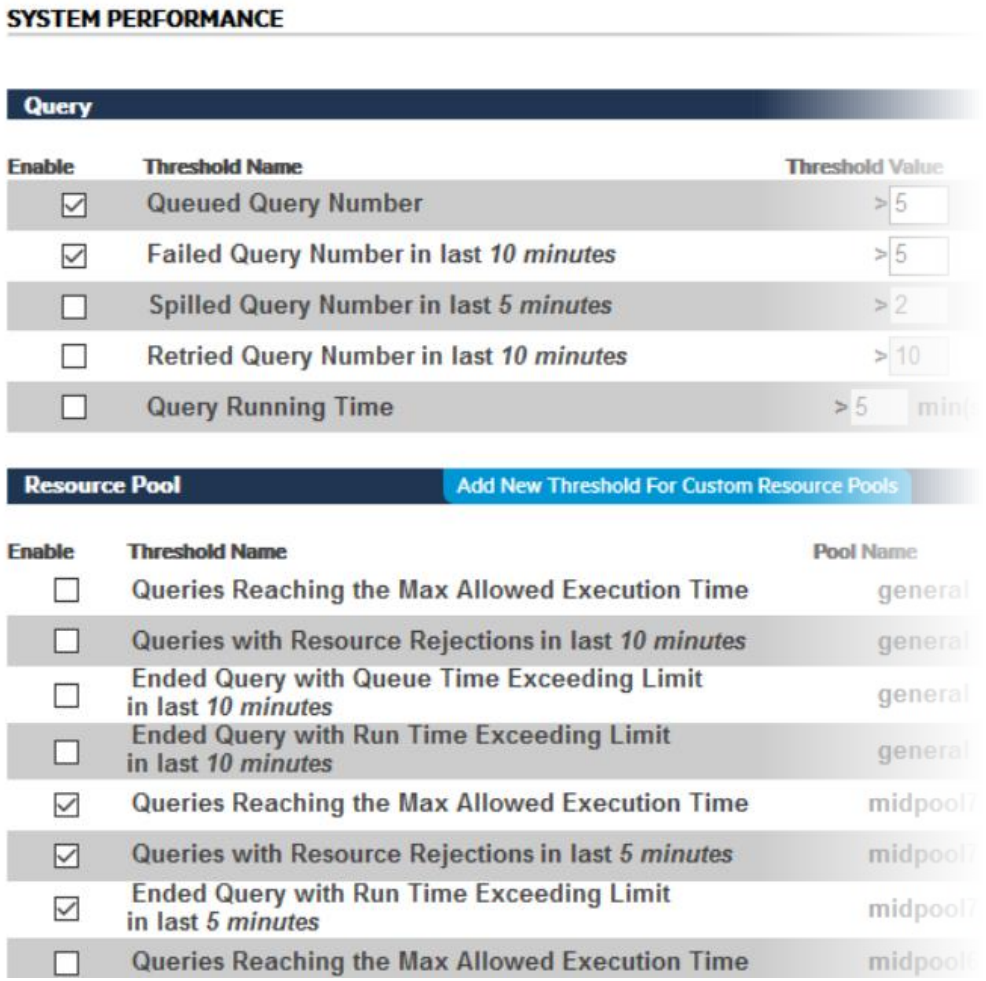
Scenario 2:
Alerts received via email

Alerts: Failed Queries and Resource Rejections

What process can be used to gain a deeper insight?

- Create a set of **thresholds** based on the concerns in your Vertica Database environment

- When **alerts** are triggered, solve the problems with Management Console visualizations.



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MC Sends Database Administrator 2 Email Alerts - 1

Vertica Management Console

1

Resource rejections and …

Recent threshold alerts for: joe.e.walsh-jr@microfocus.com

Resource Pool: midpool7; Threshold : Queries with Resource Rejections > 5

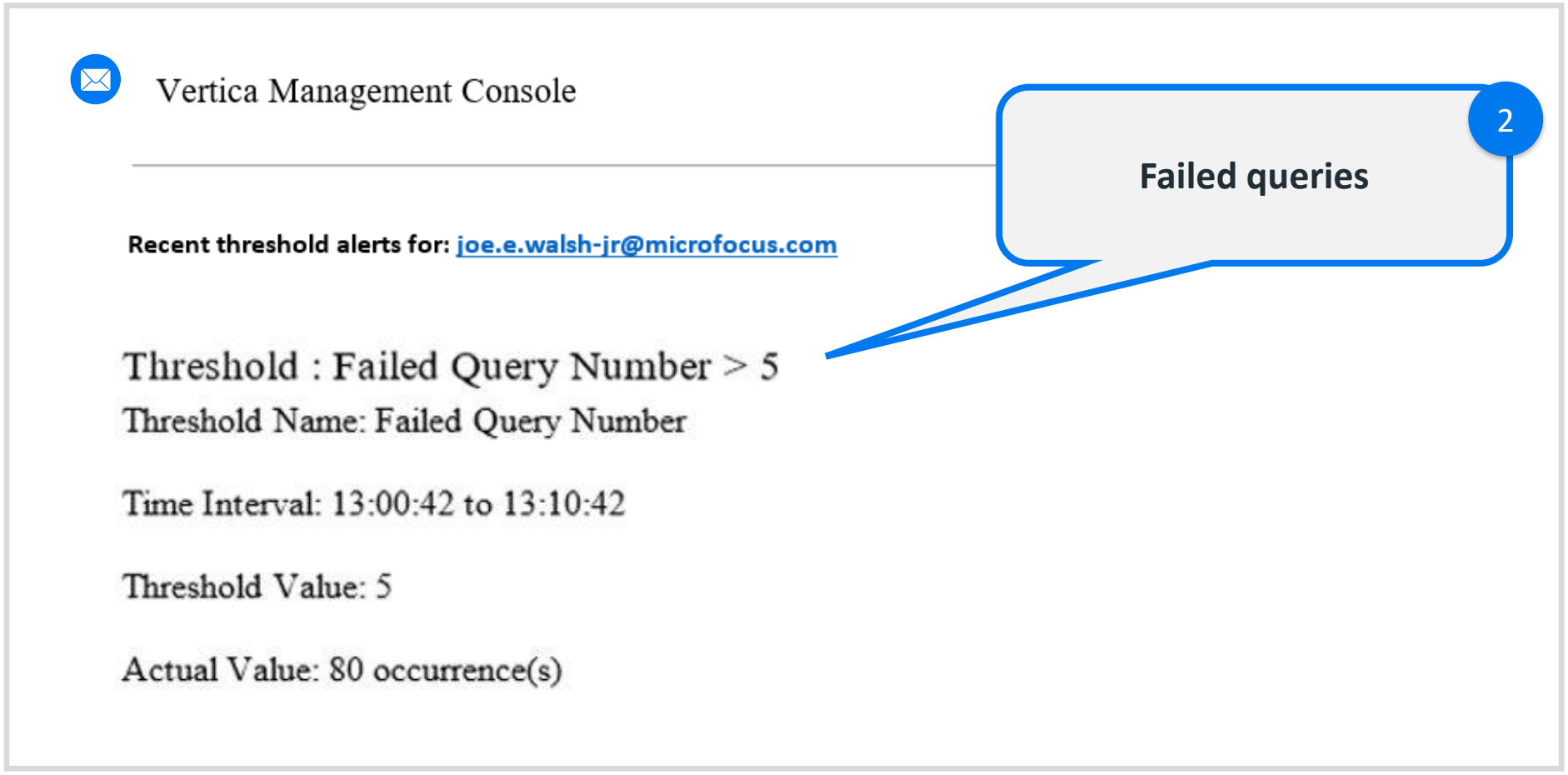
Resource Pool: midpool7

Threshold Name: Queries with Resource Rejections

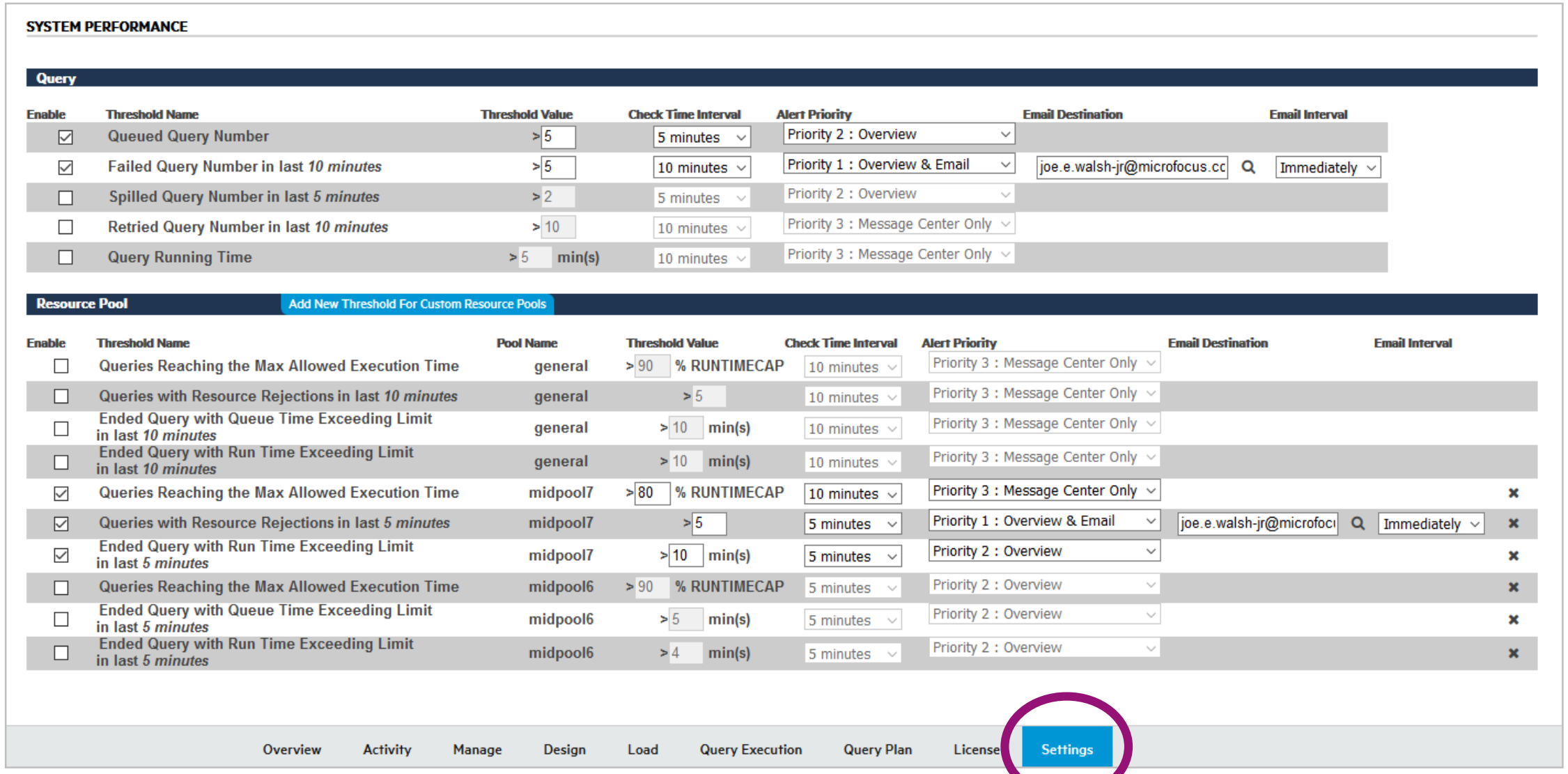
Time Interval: 13:07:37 to 13:12:37

Threshold Value: 5

MC Sends Database Administrator 2 Email Alerts - 2



Settings Tab: Review the Thresholds Set in MC



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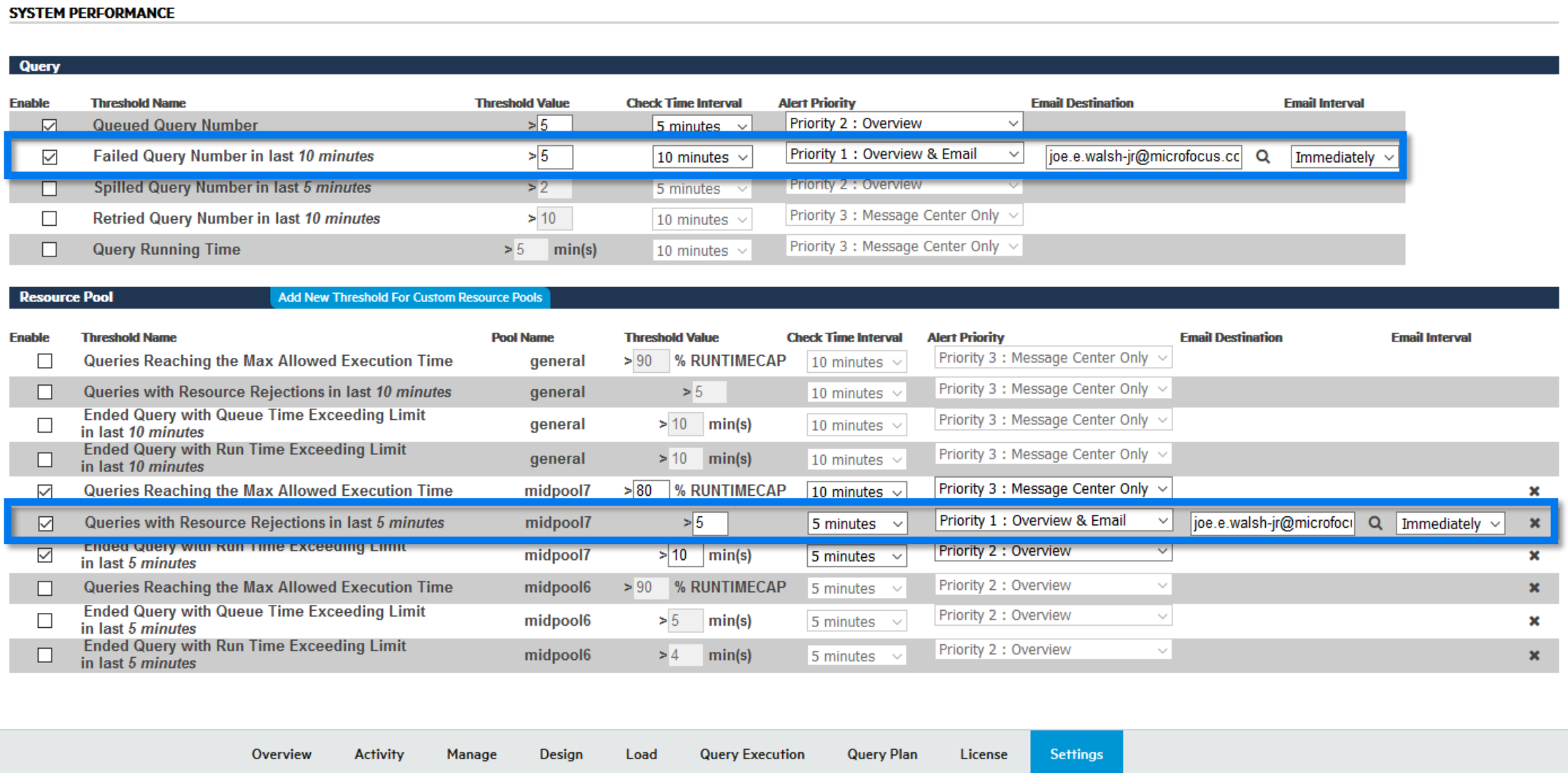

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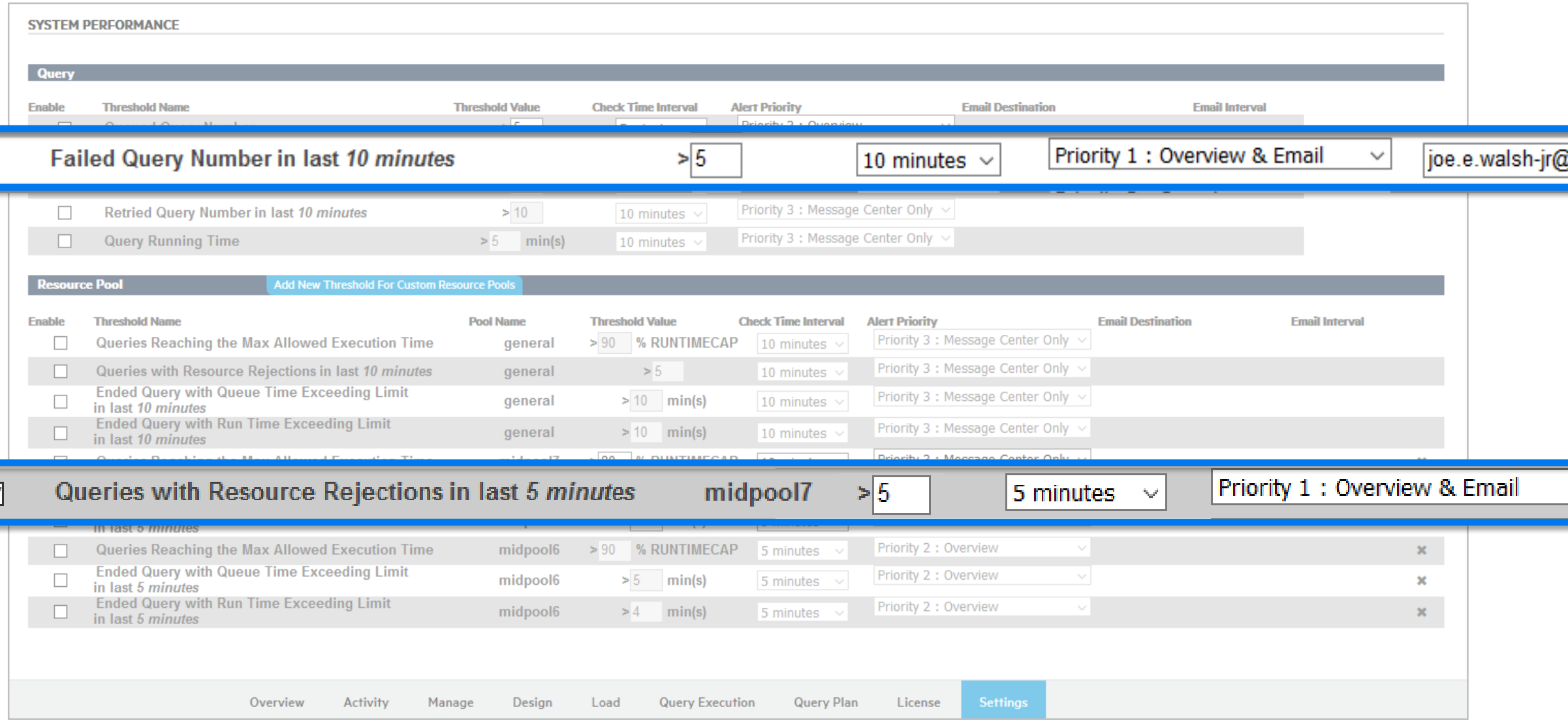

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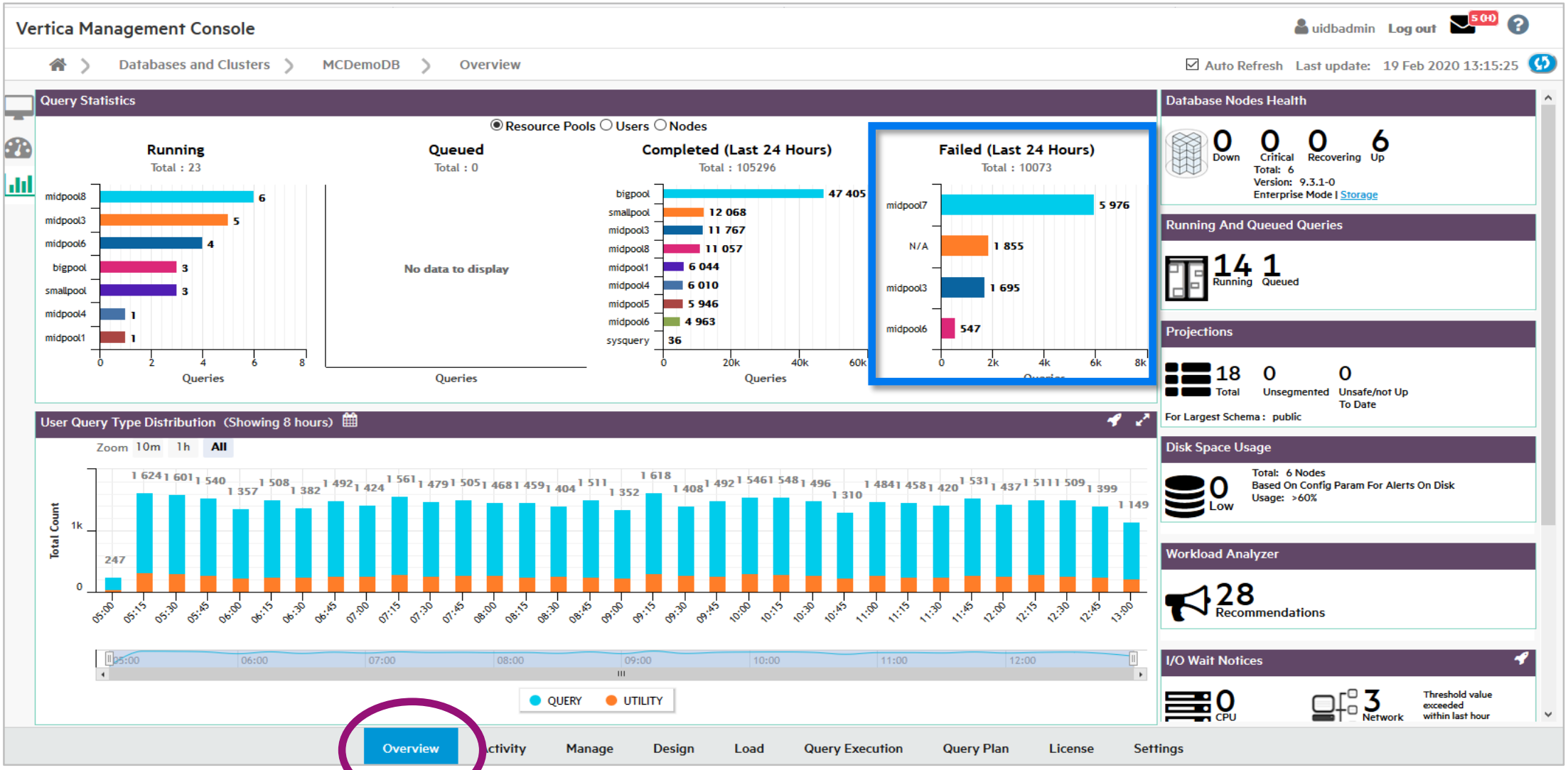
Overview Tab: Review the Query Synopsis



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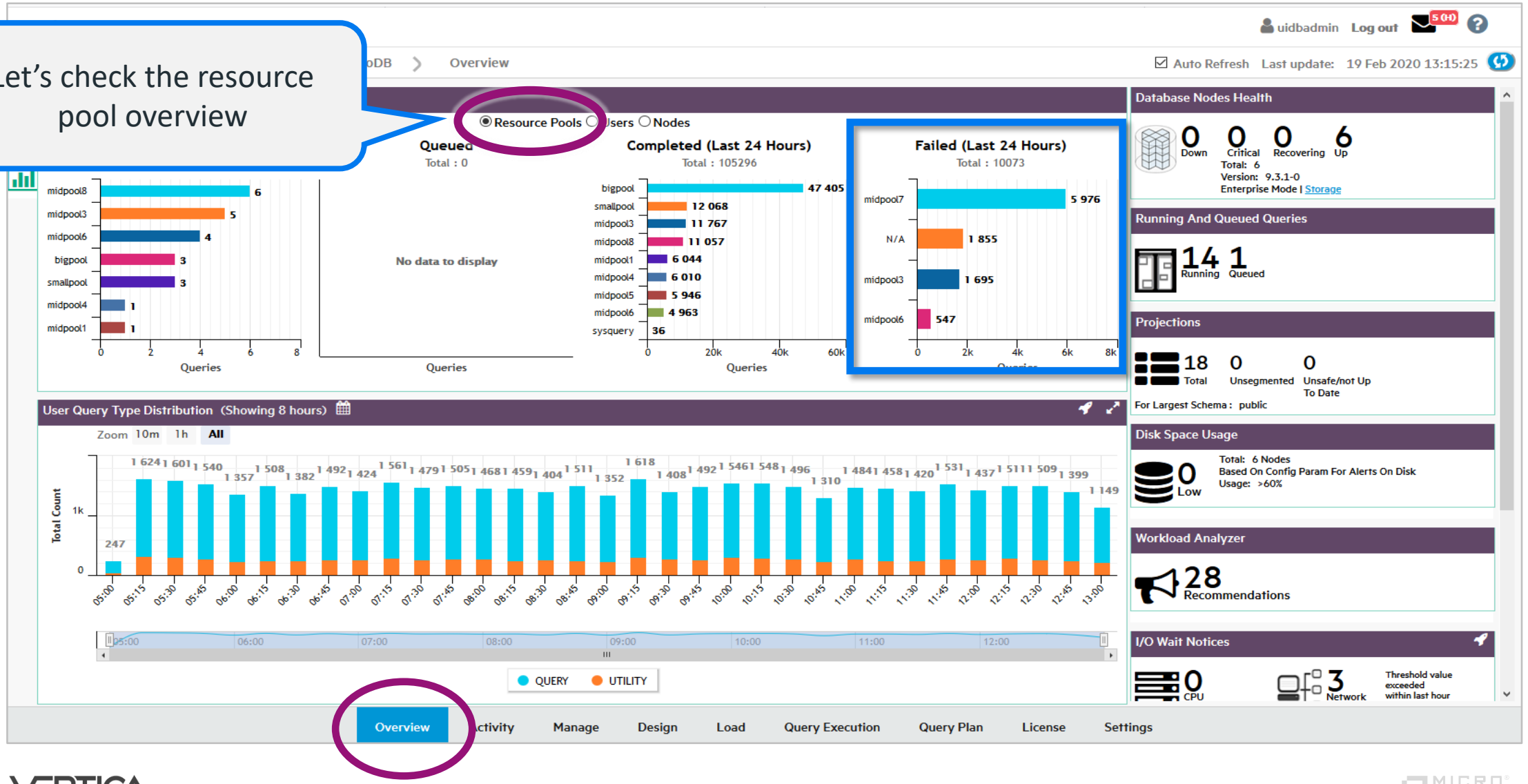
Overview Tab: Review the Query Synopsis

Let's check the resource pool overview



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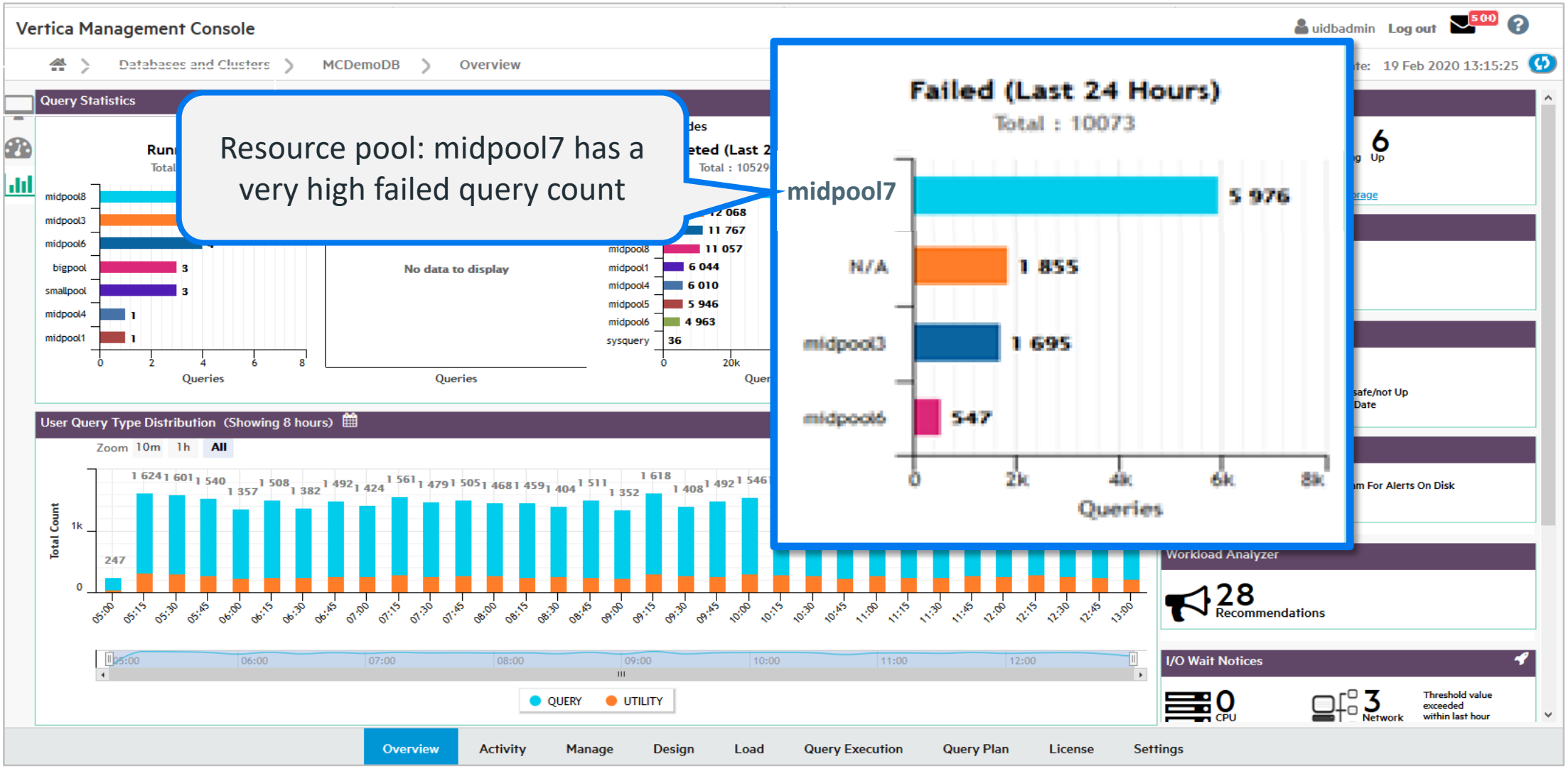

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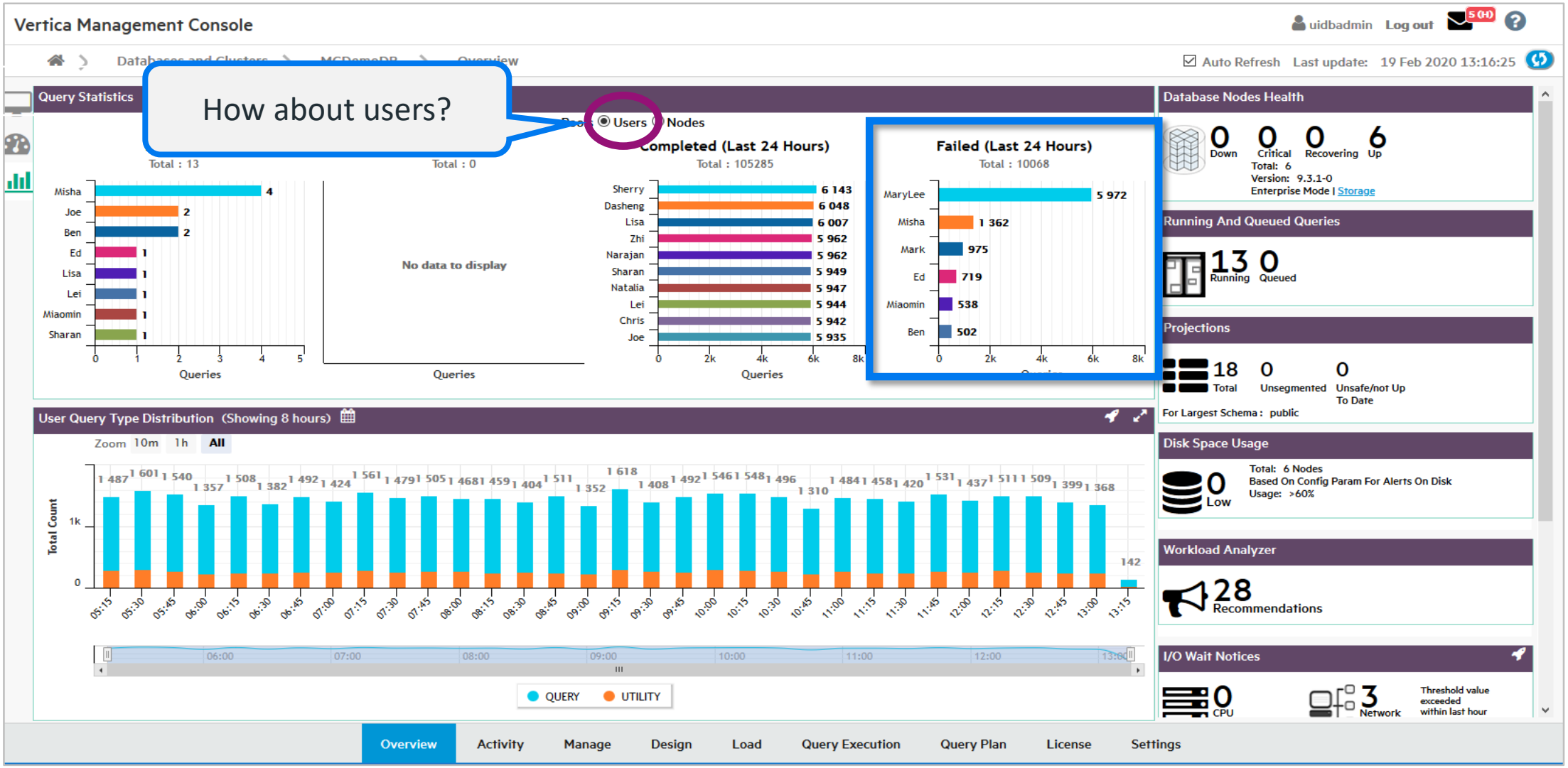

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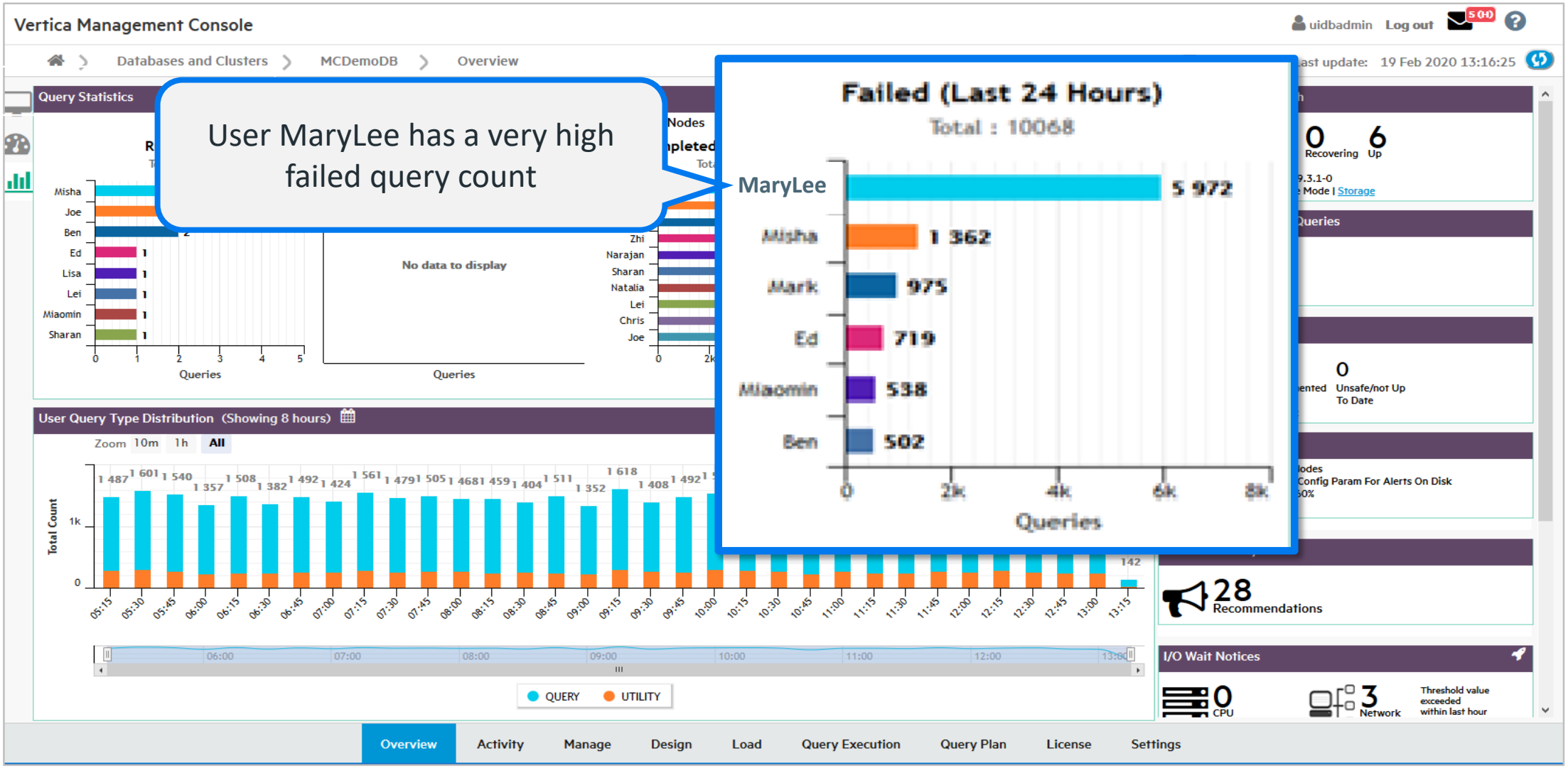

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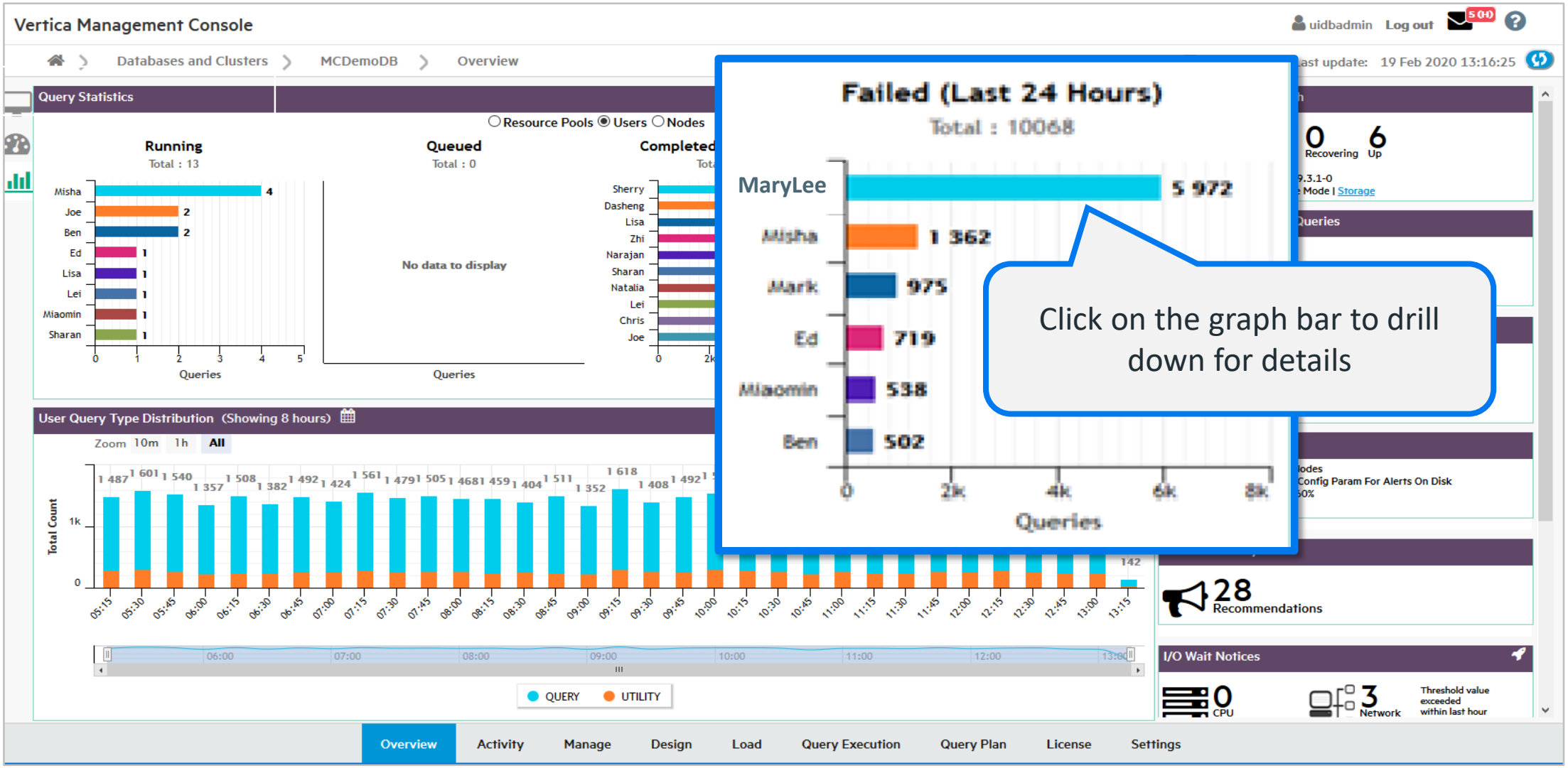

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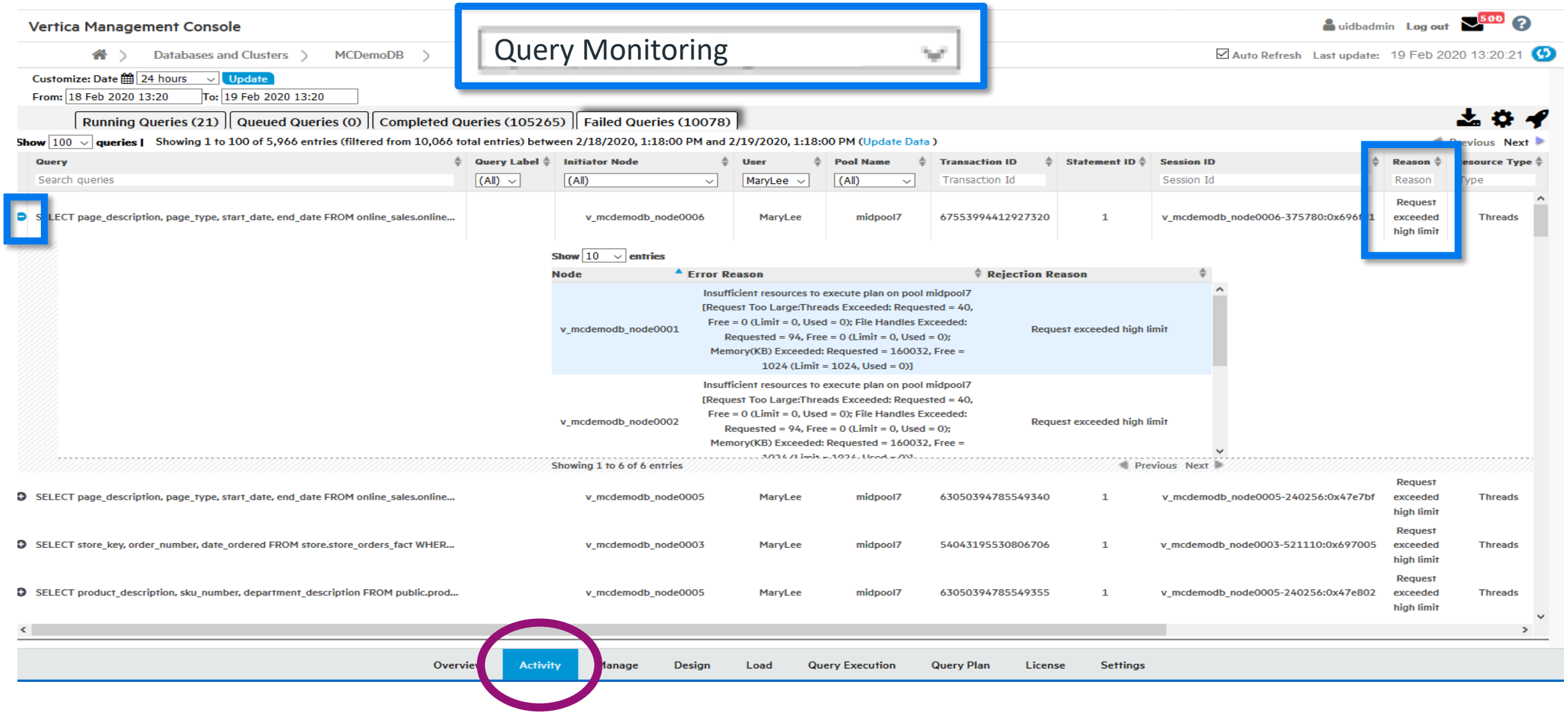
Activity Tab: Query Monitoring for User: MaryLee



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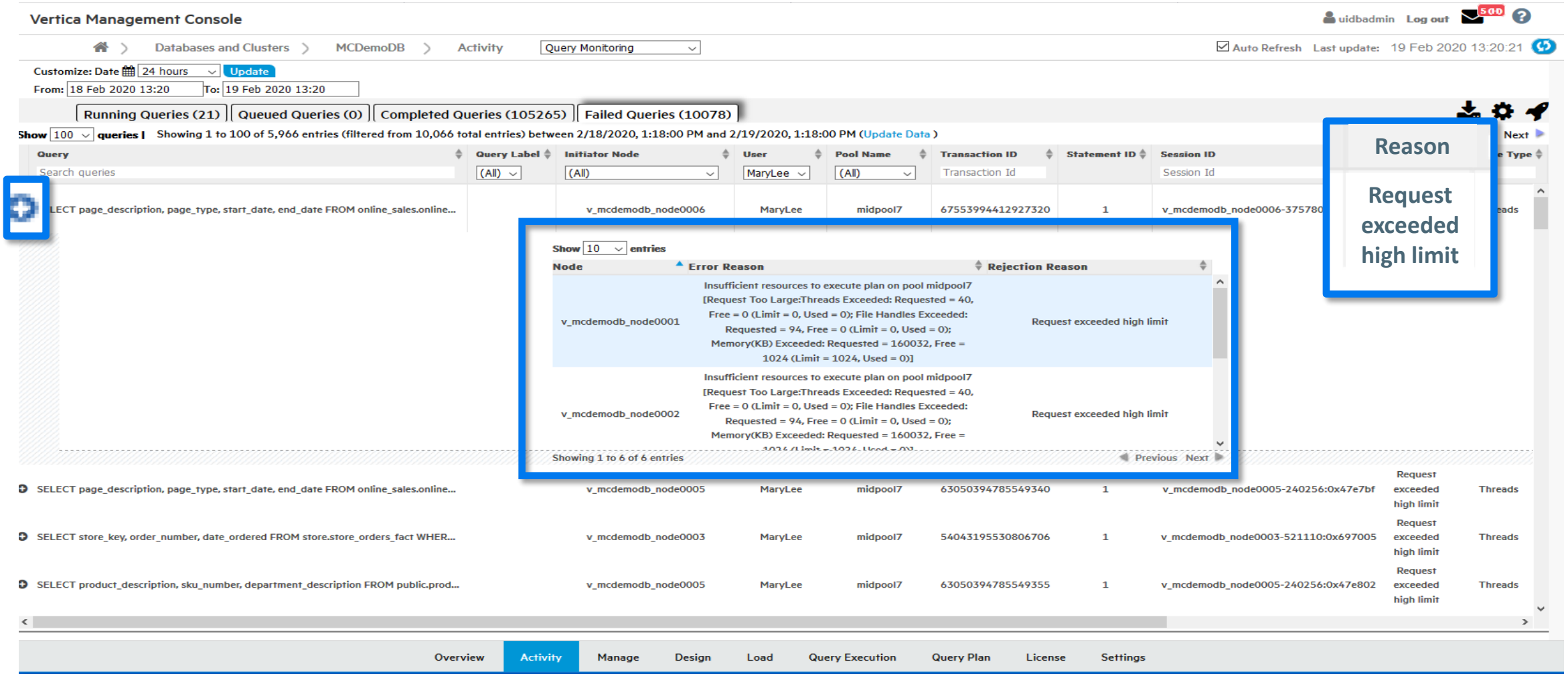

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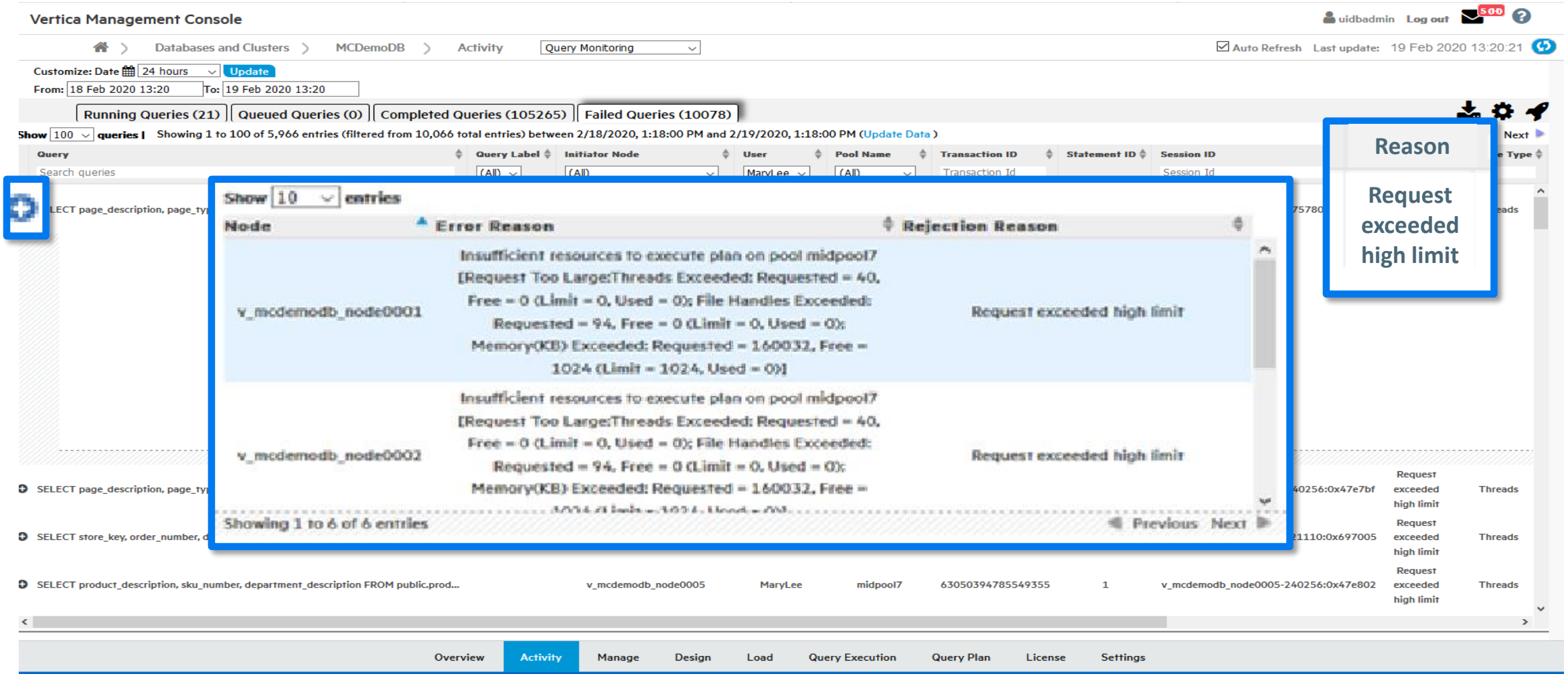

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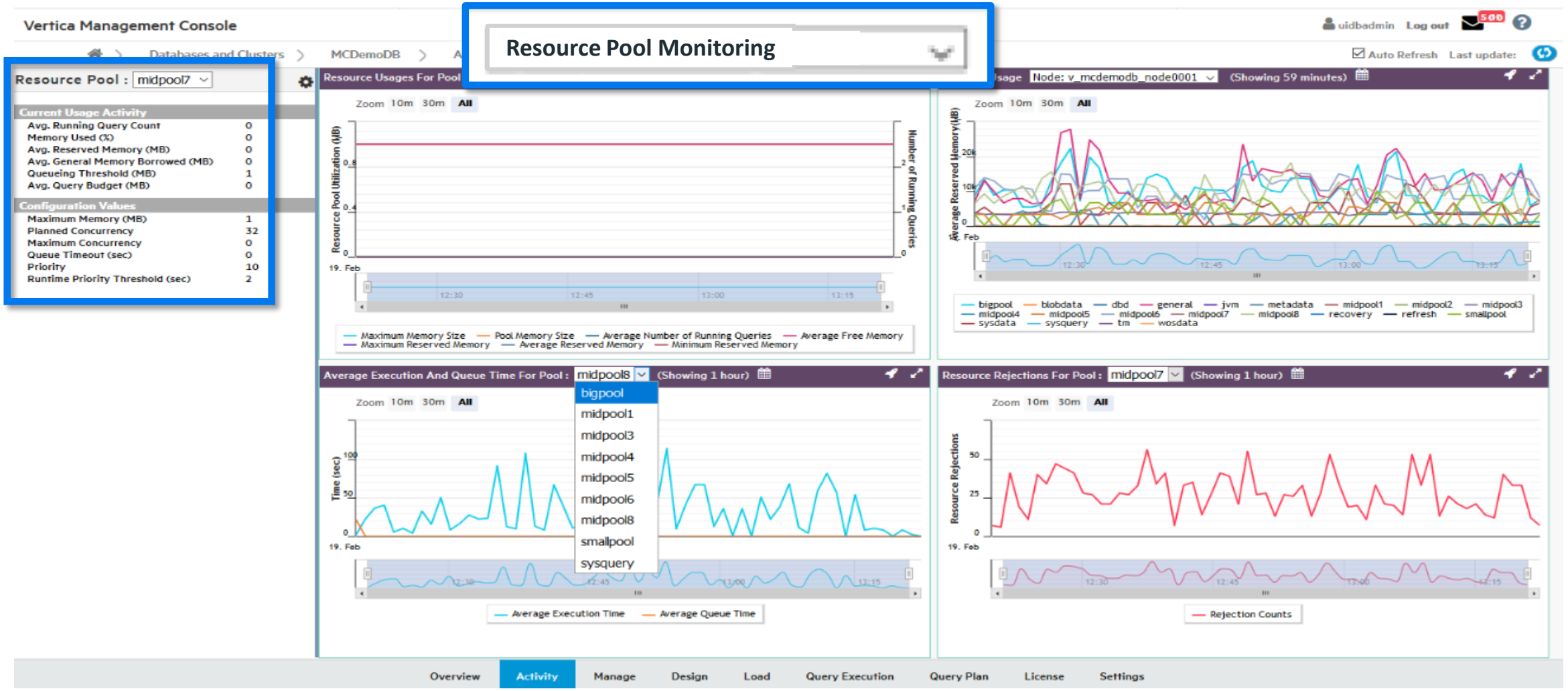
Activity Tab: Resource Pool – midpool7



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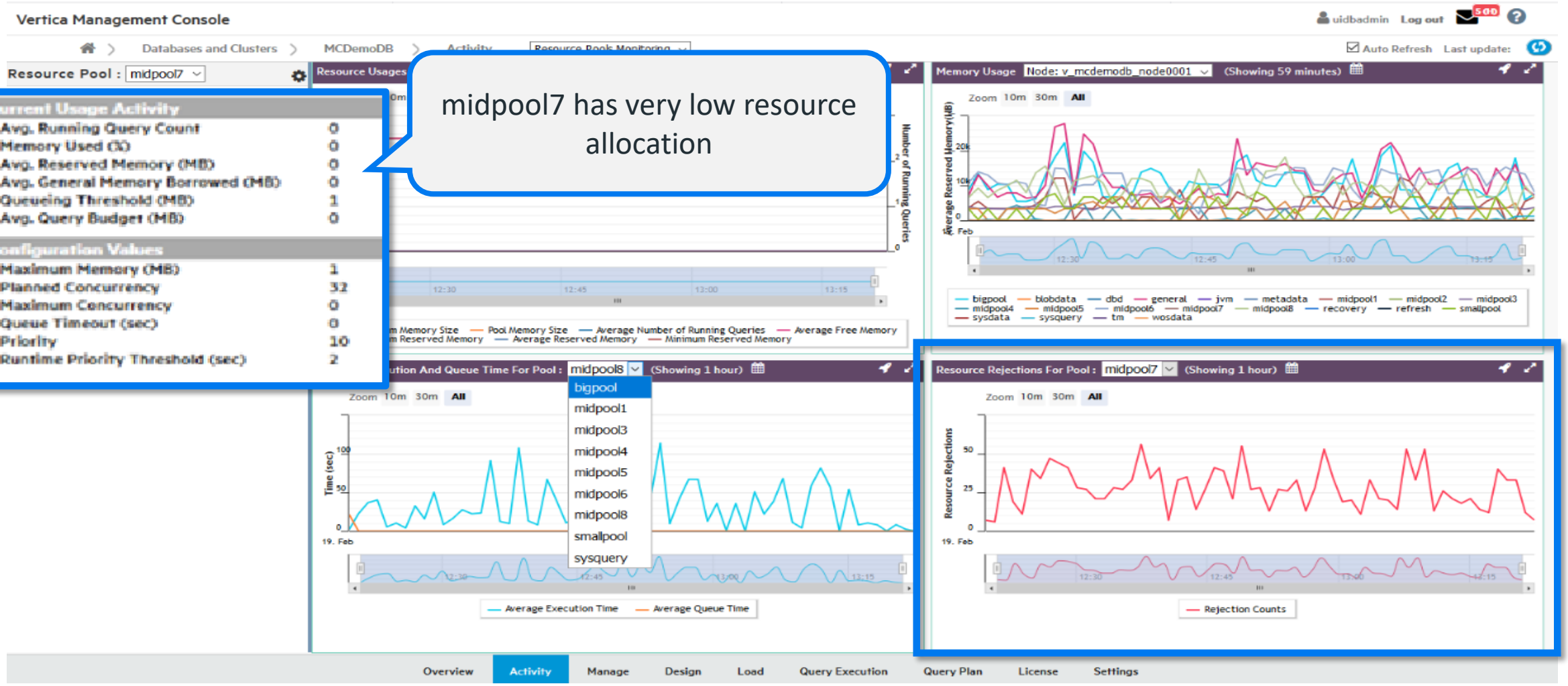

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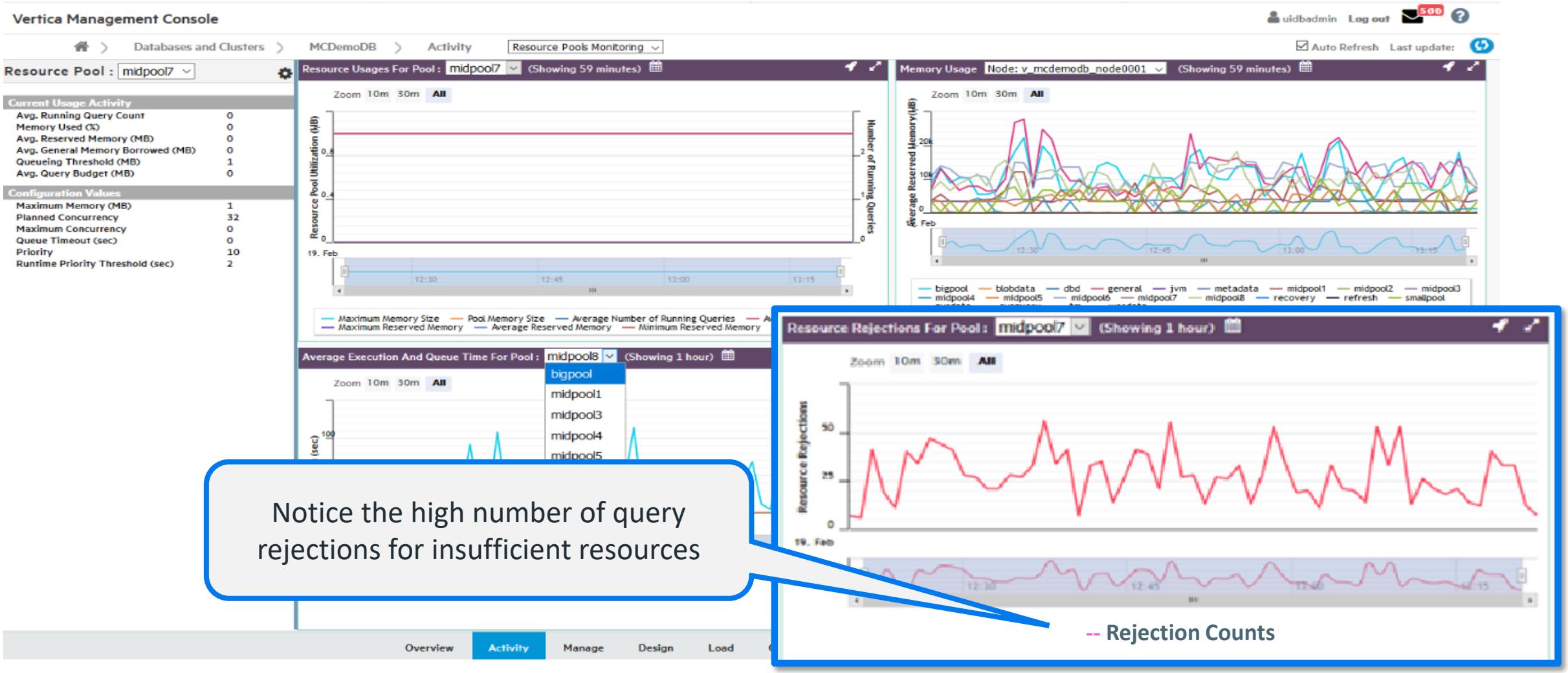
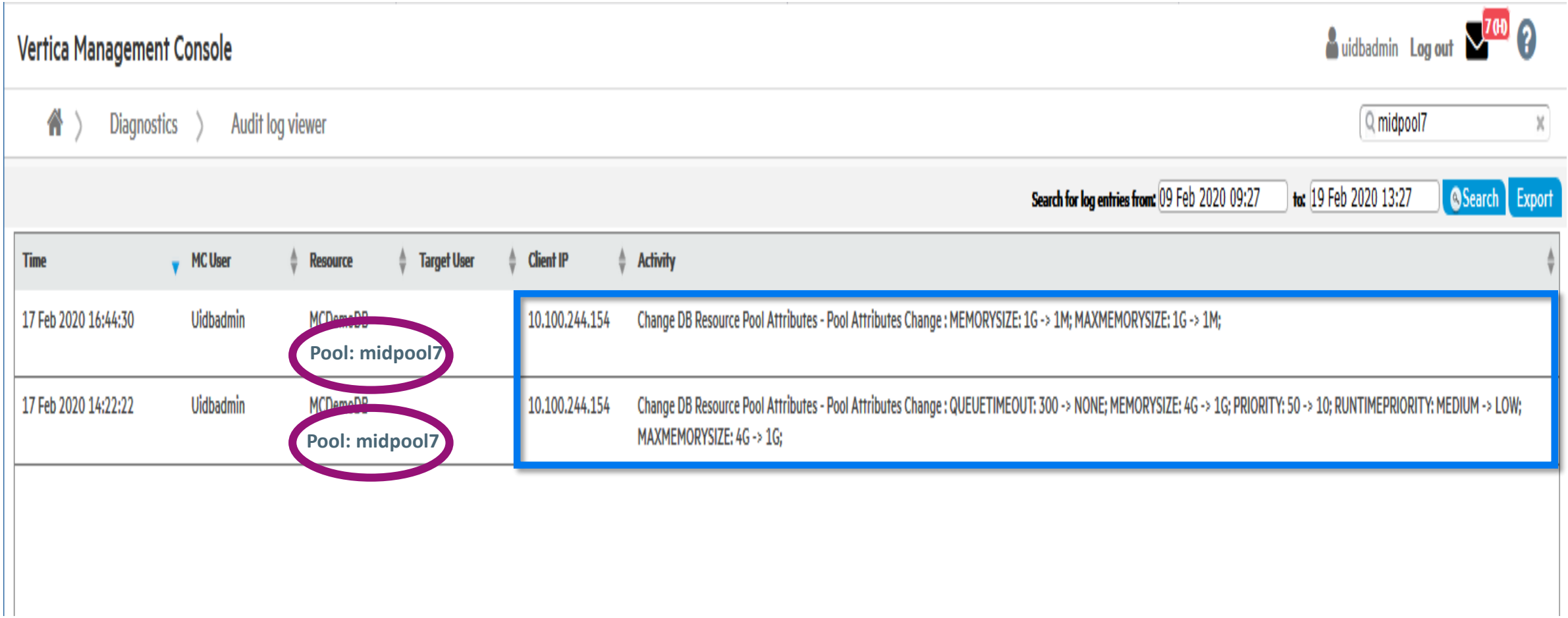


Audit Log – That's weird



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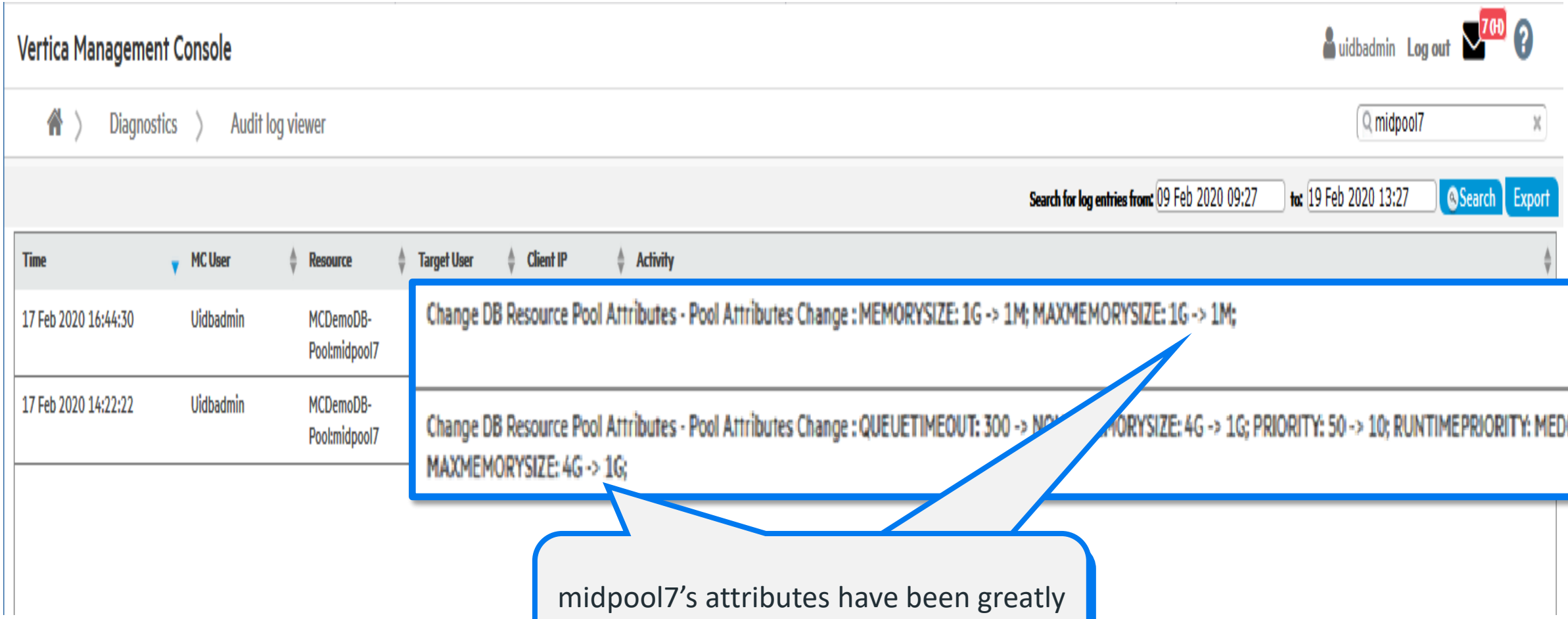
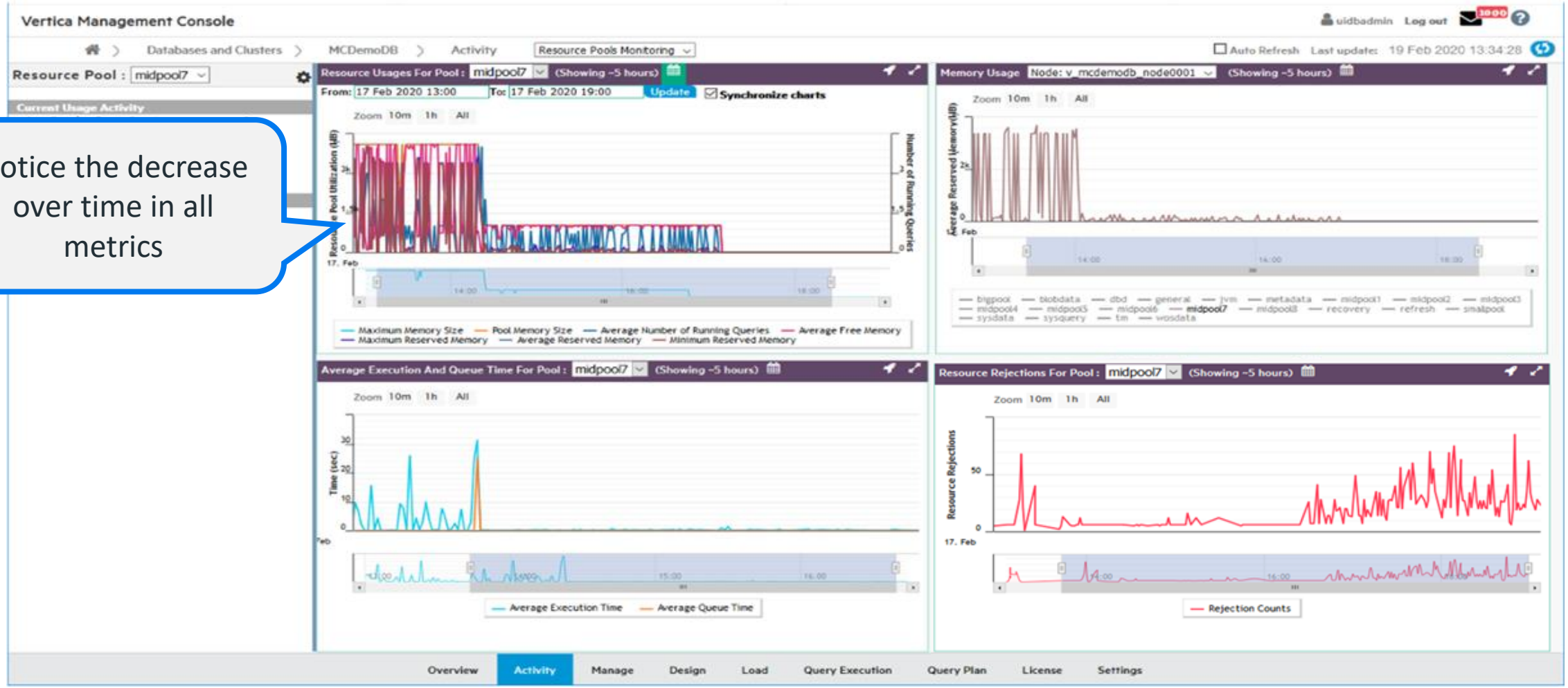


midpool7's attributes have been greatly reduced

Activity Tab: Resource Pool Monitoring - Effects of midpool7 changes

Time Range: Feb 17, 13:00 – 19:00: Midpool7 configuration changes



Notice the decrease over time in all metrics

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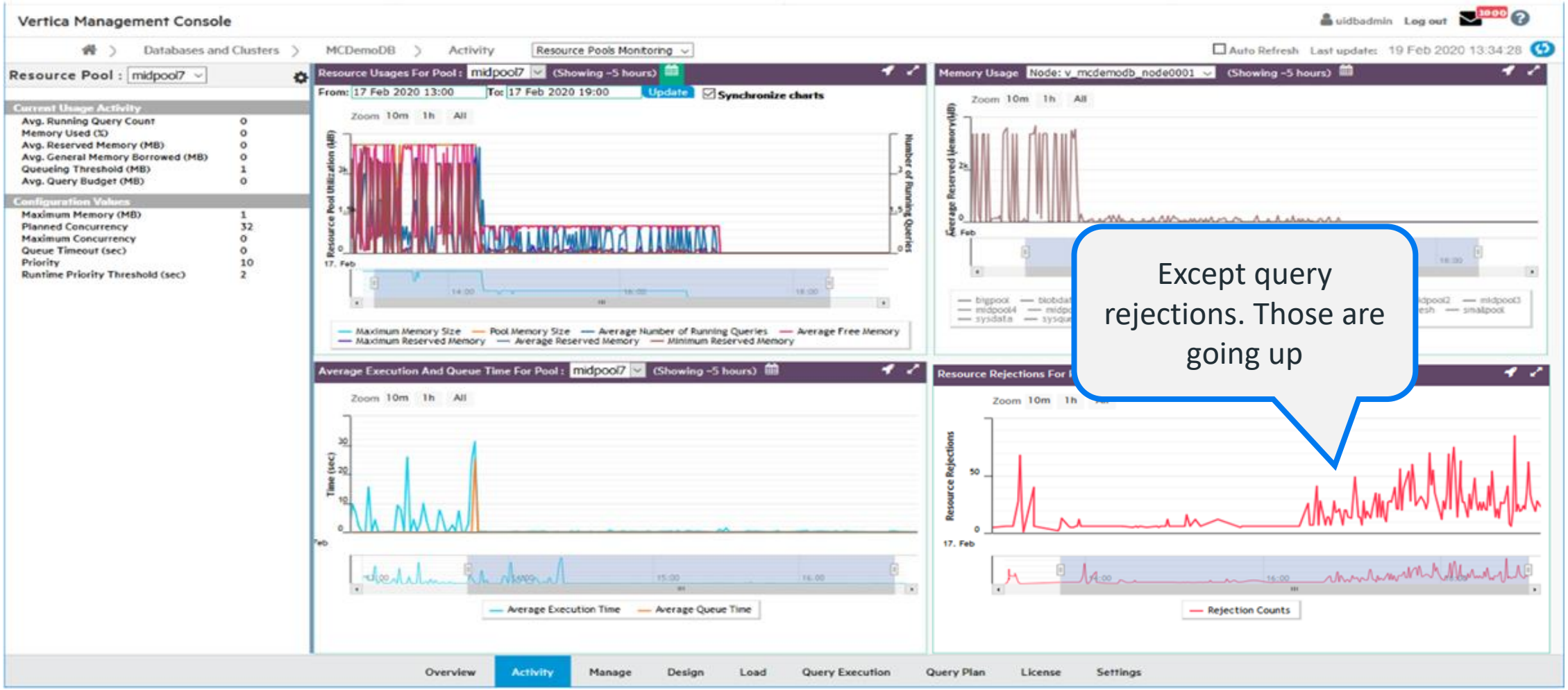
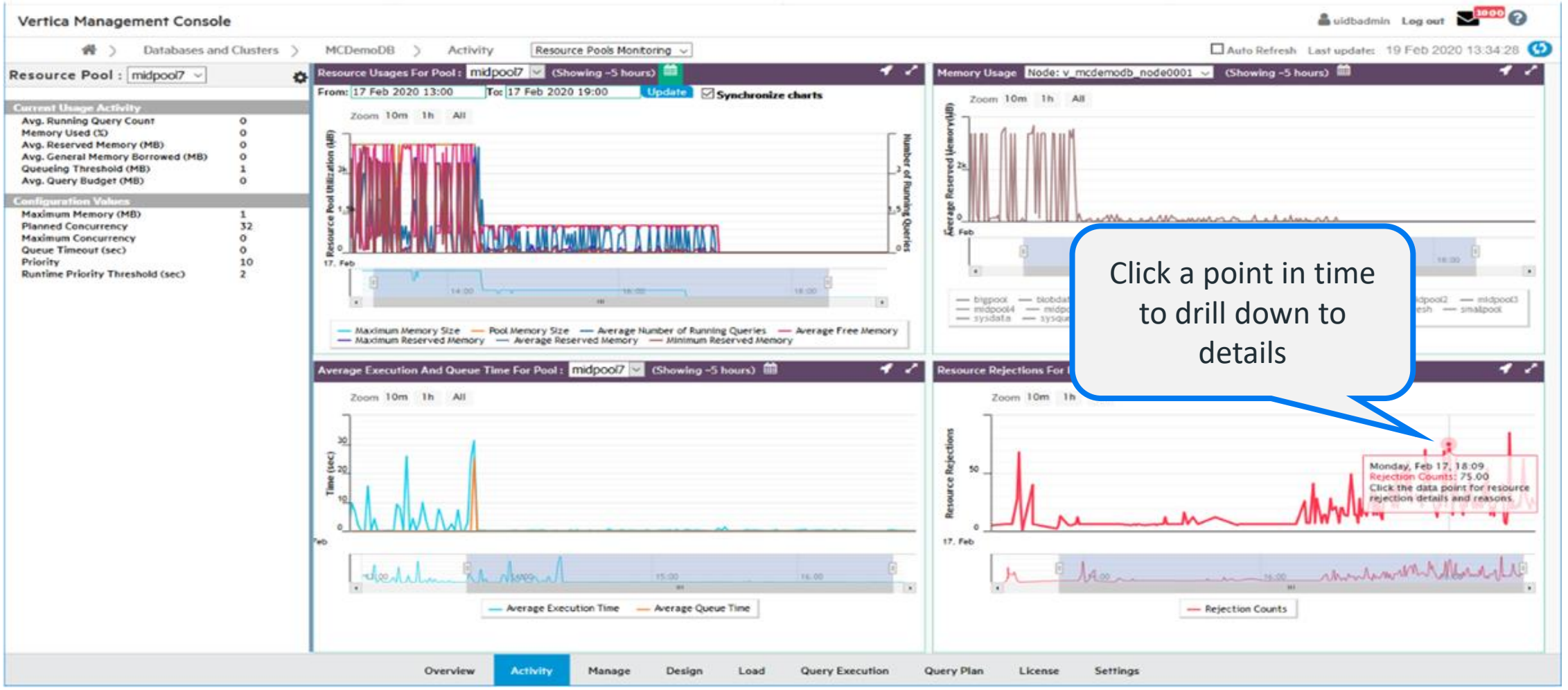


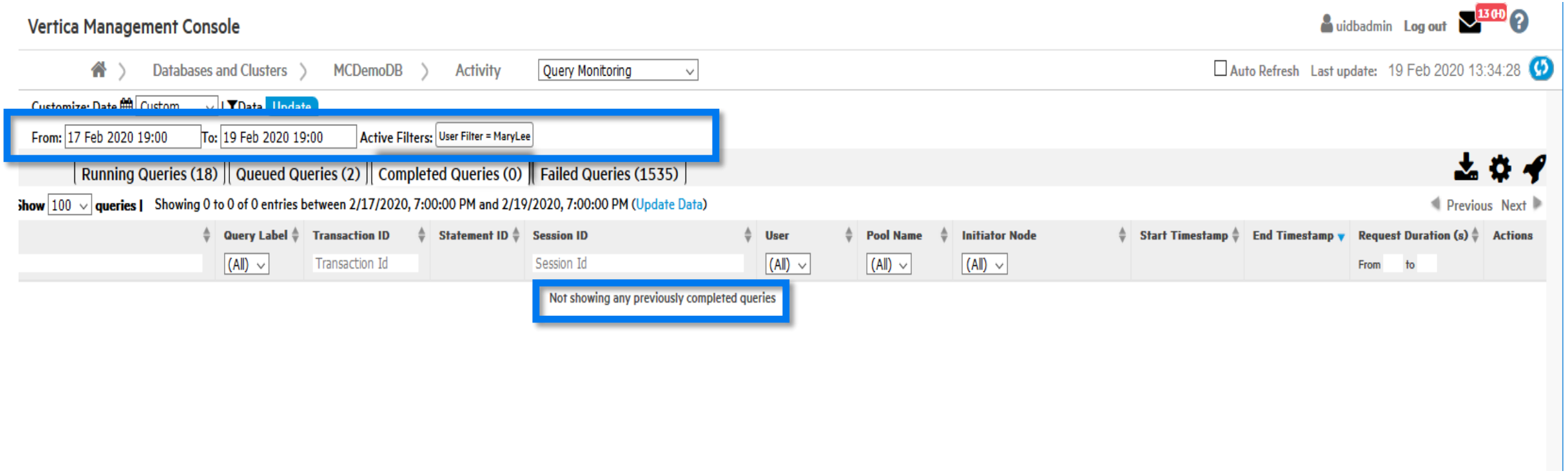
Resource Pool Monitoring: Analyze effects of midpool7 changes

Time Range: Feb 17, 13:00 – 19:00: Midpool7 configuration changes



Activity Tab: Query Monitoring: Effects of midpool7 changes

Time Range: Feb 17, 19:00 – Feb 19, 19:00: Completed Queries – User: MaryLee



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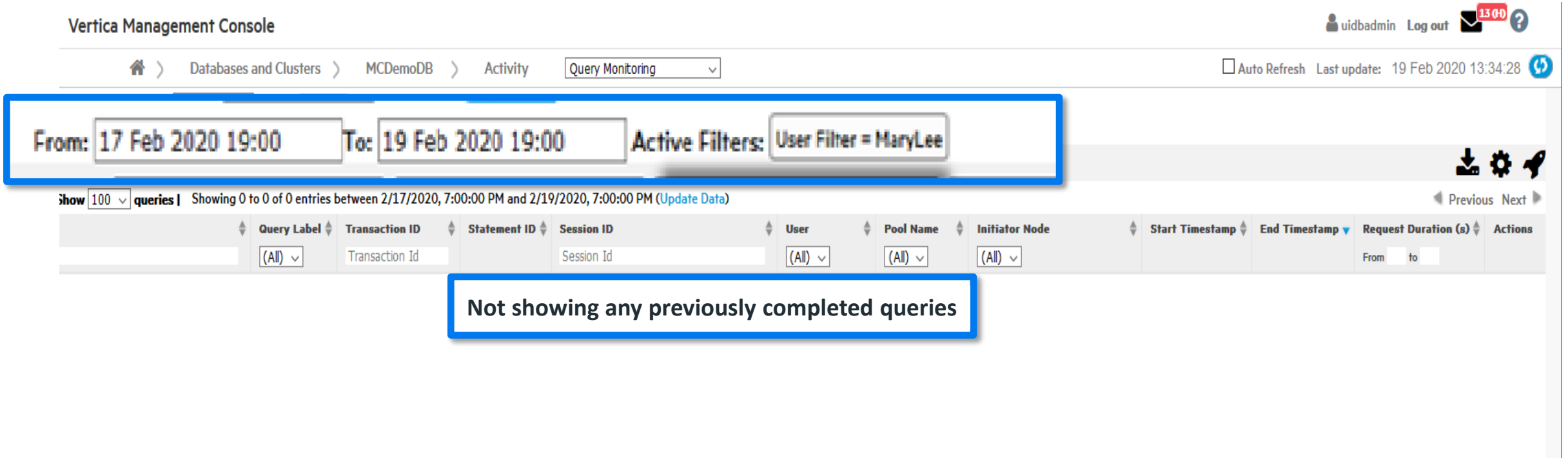

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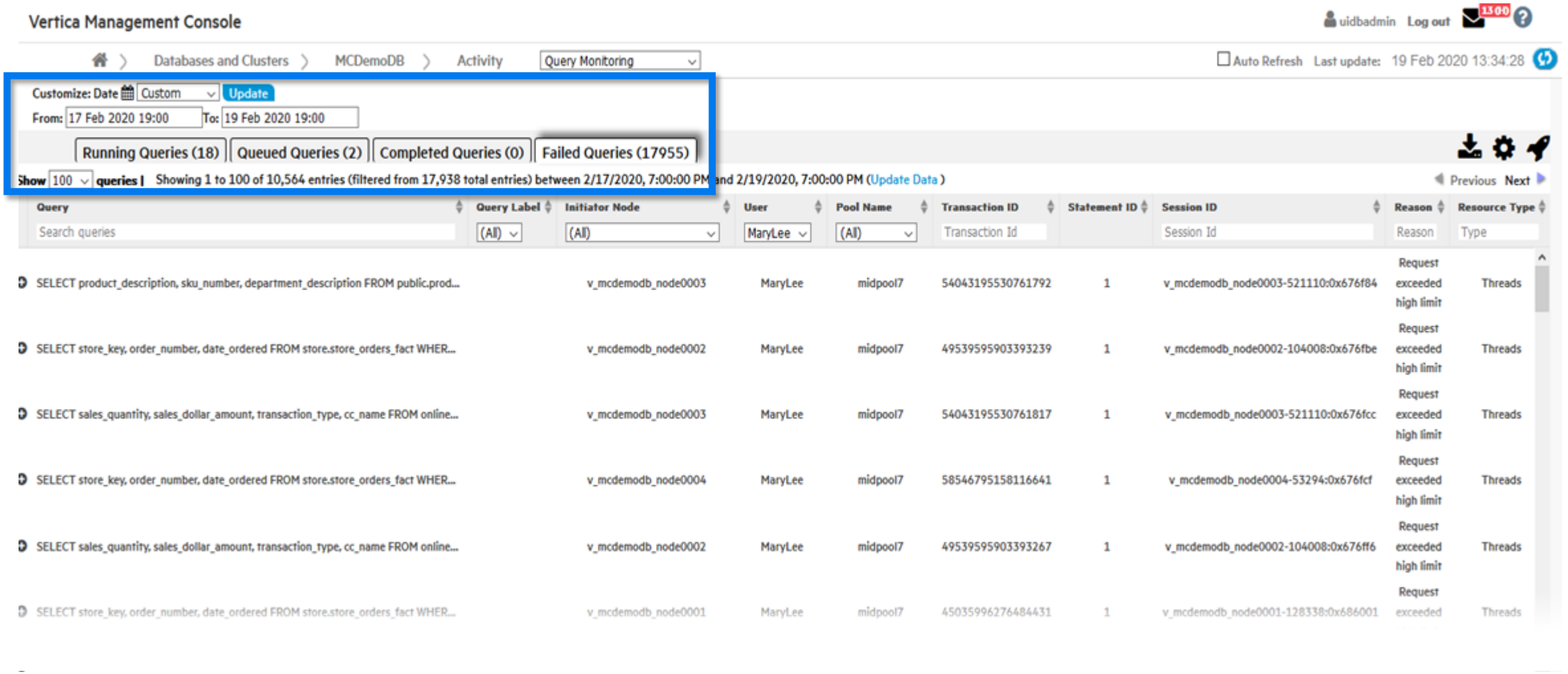
Time Range: Feb 17, 19:00 – Feb 19, 19:00: Failed Queries – User: MaryLee



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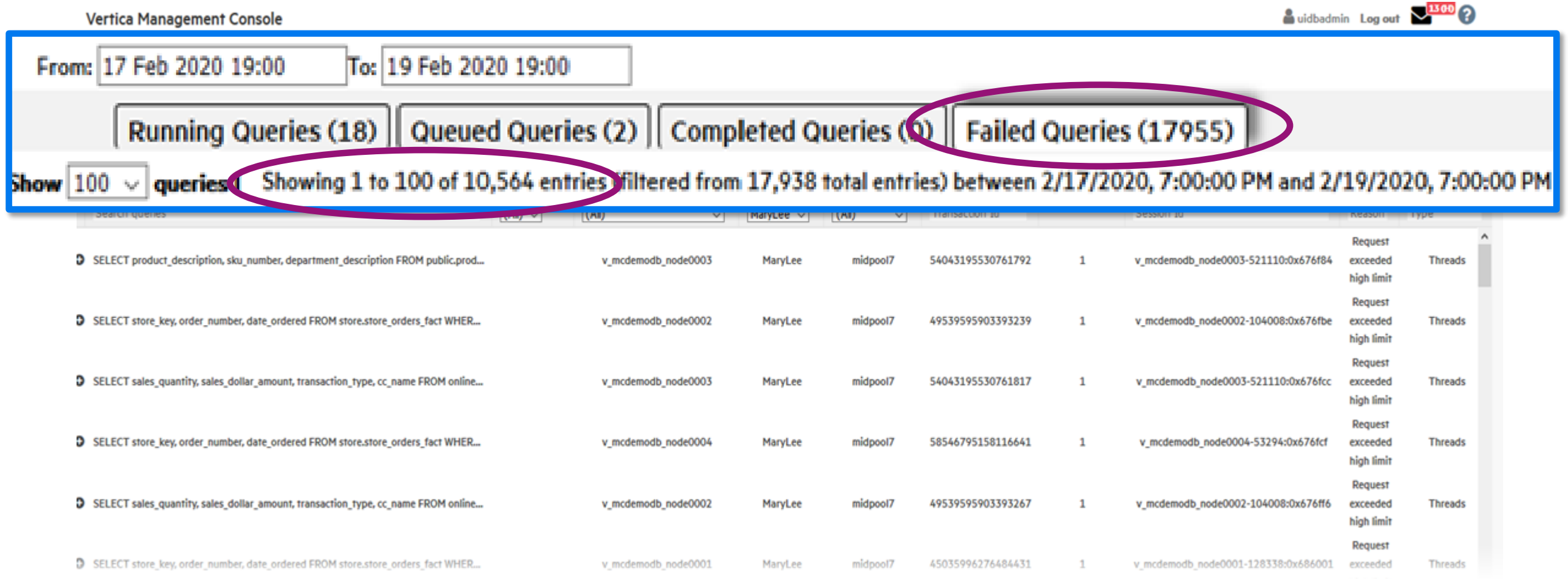
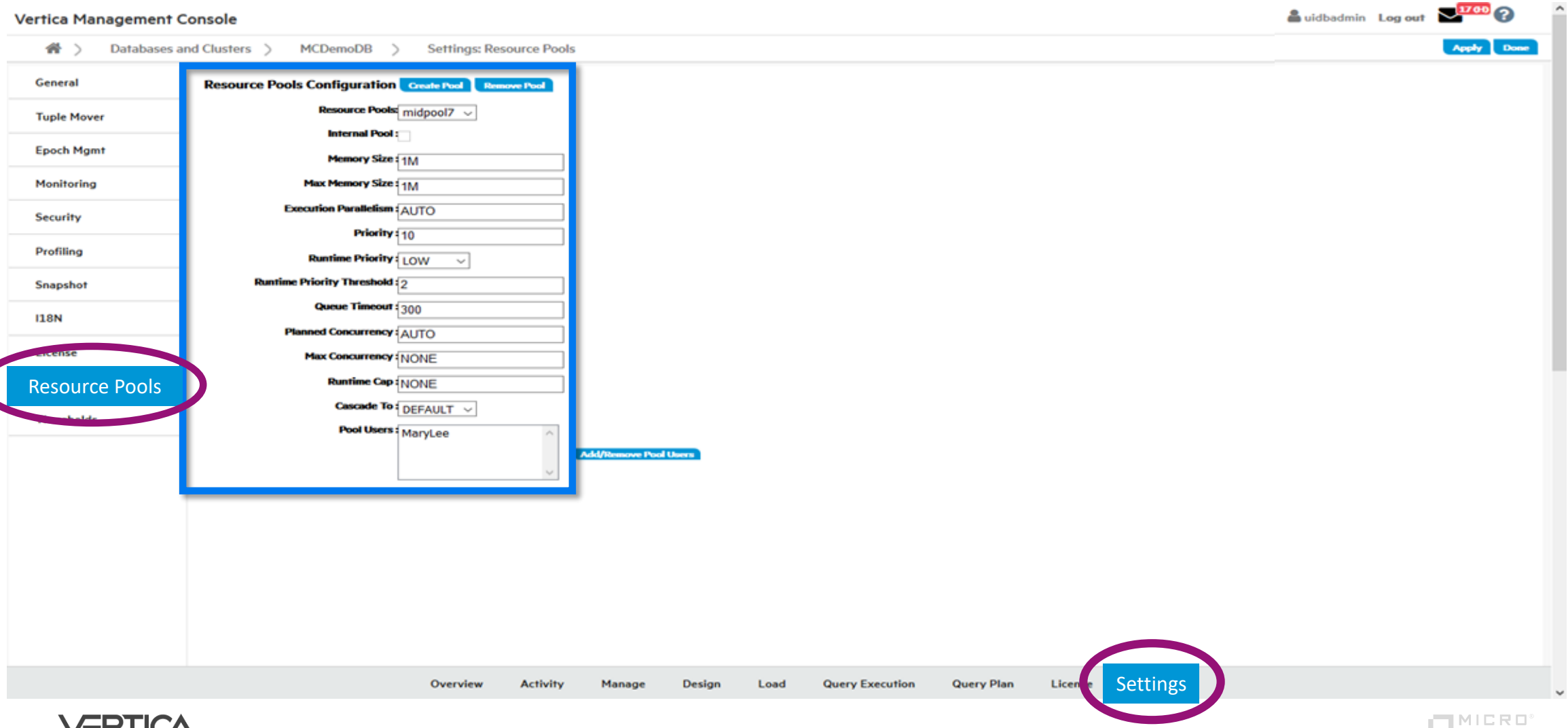
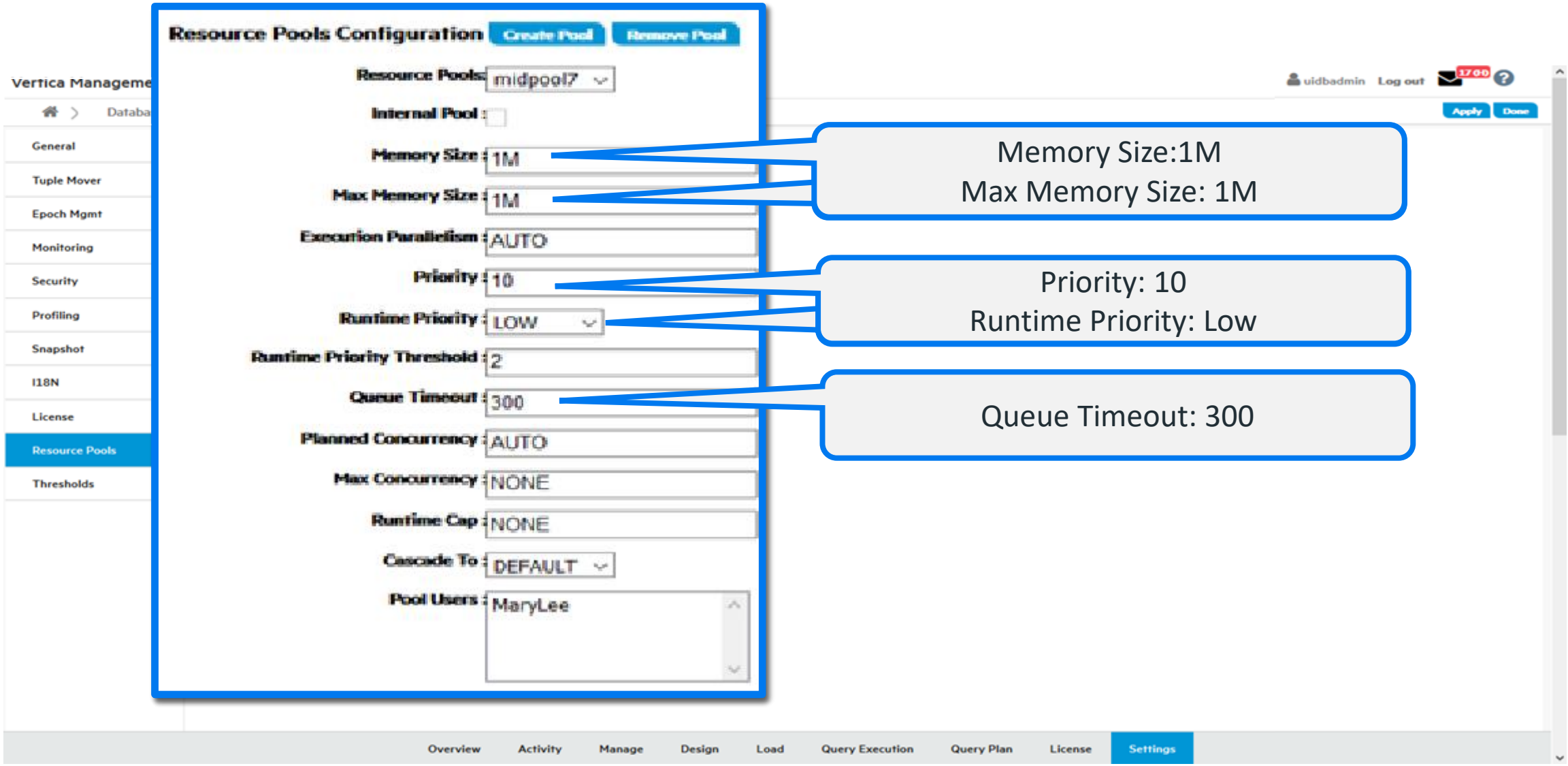


Settings Tab: Resource Pools Configuration



Resource Pools Configuration: Adjust midpool7 attributes



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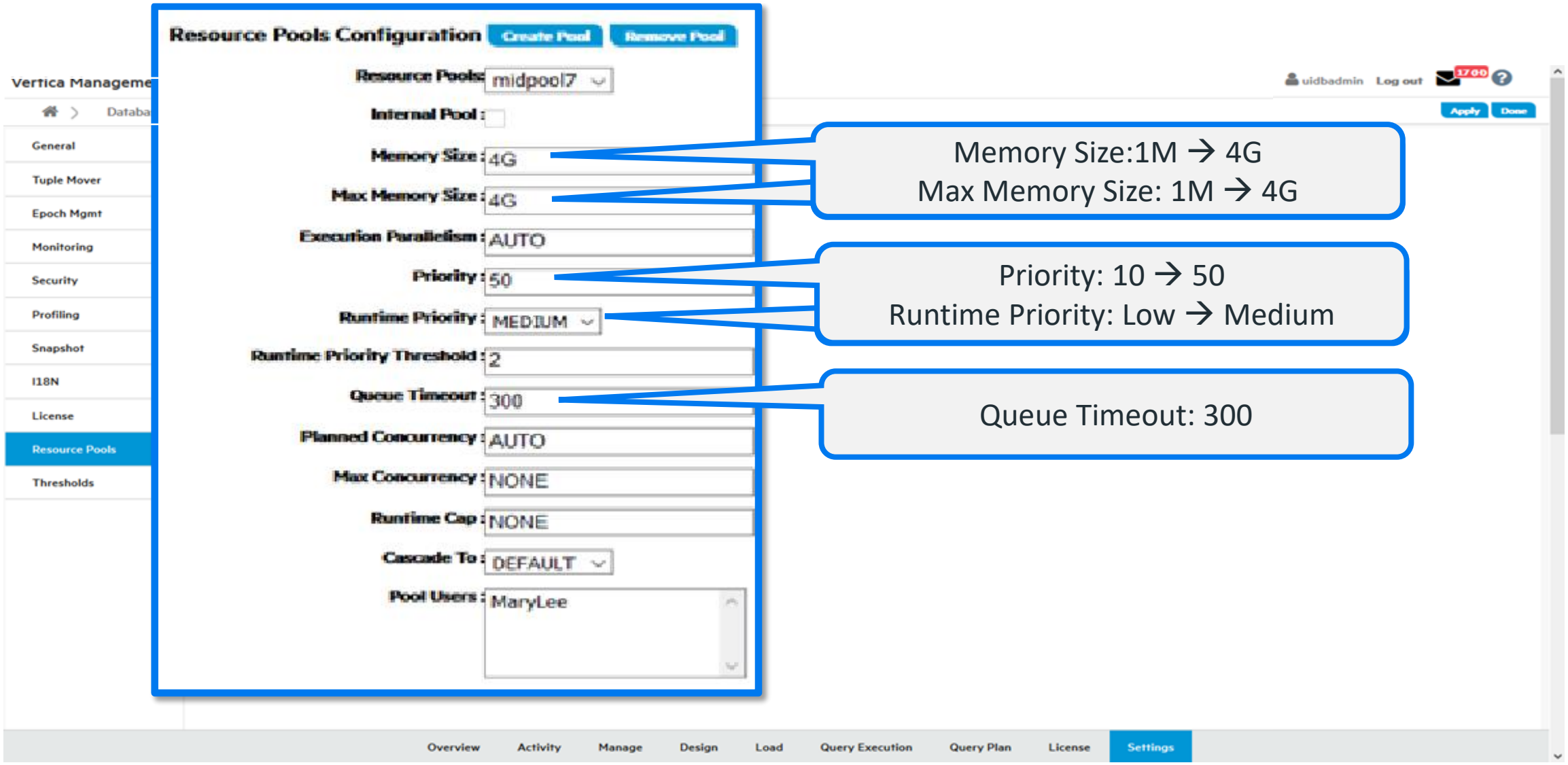

Memory Size:1M → 4G
Max Memory Size: 1M → 4G

Priority: 10 → 50
Runtime Priority: Low → Medium

Queue Timeout: 300

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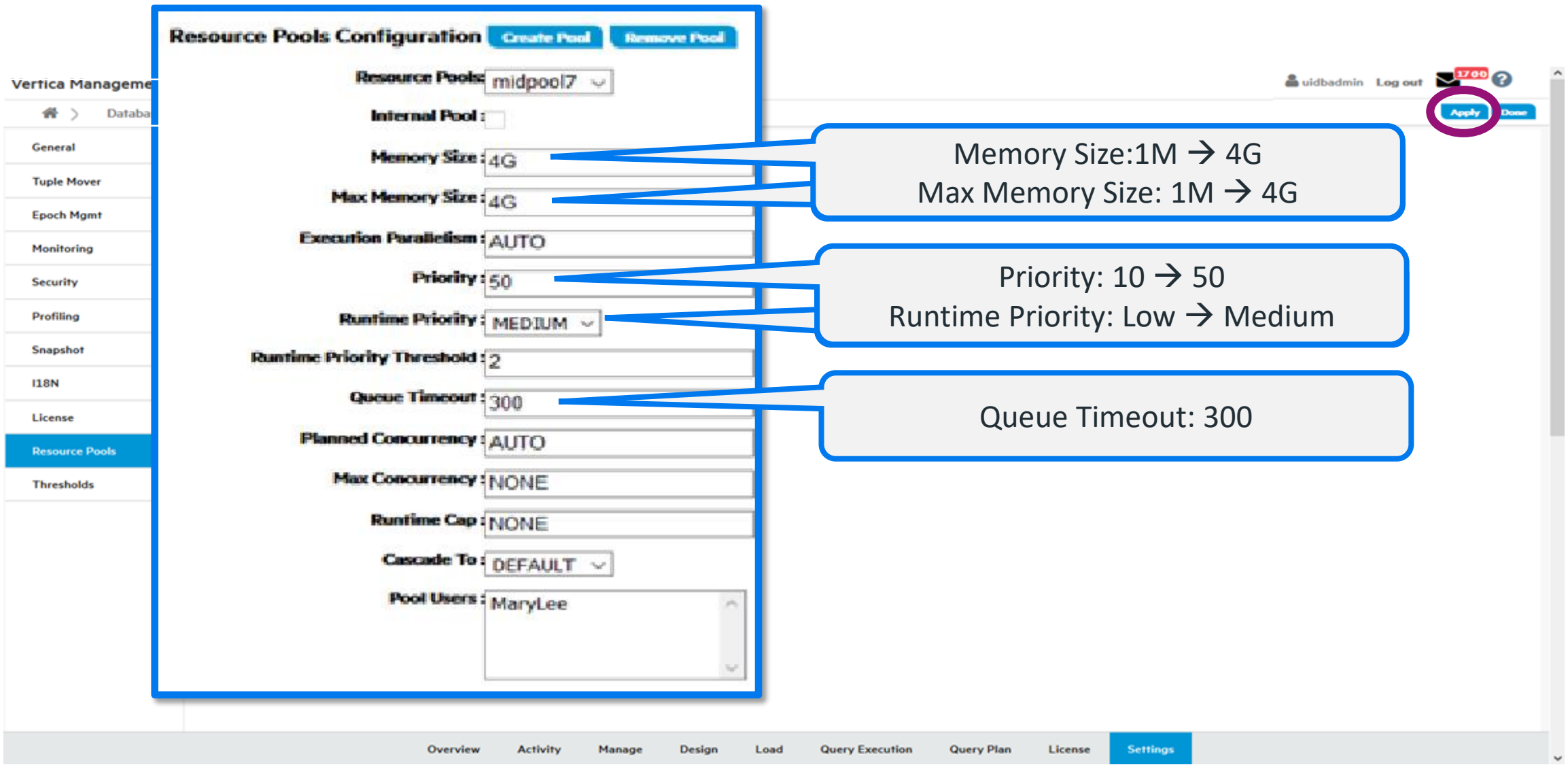
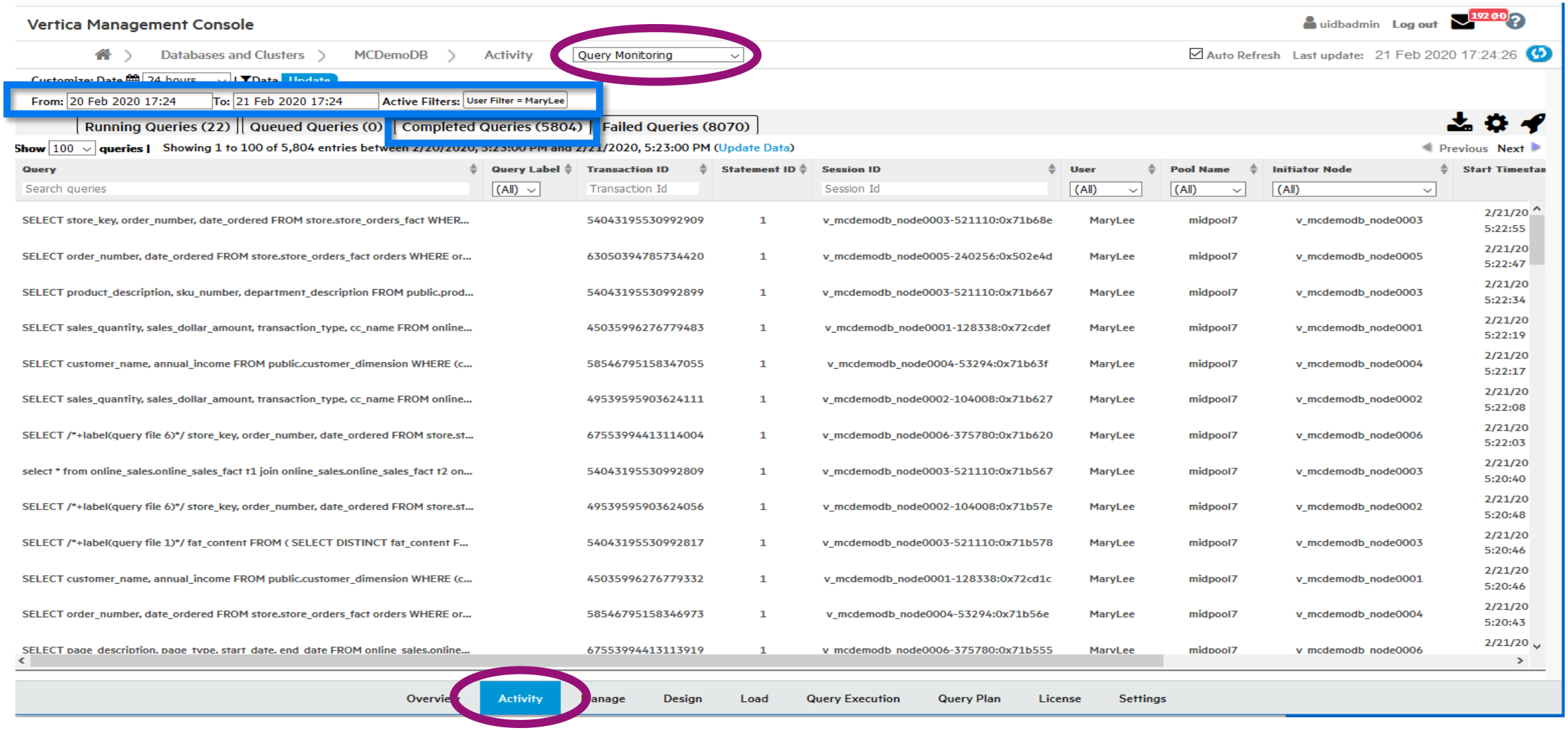
Resource Pools Configuration: Adjust midpool7 attributes



Activity Tab: Query Monitoring – Validation



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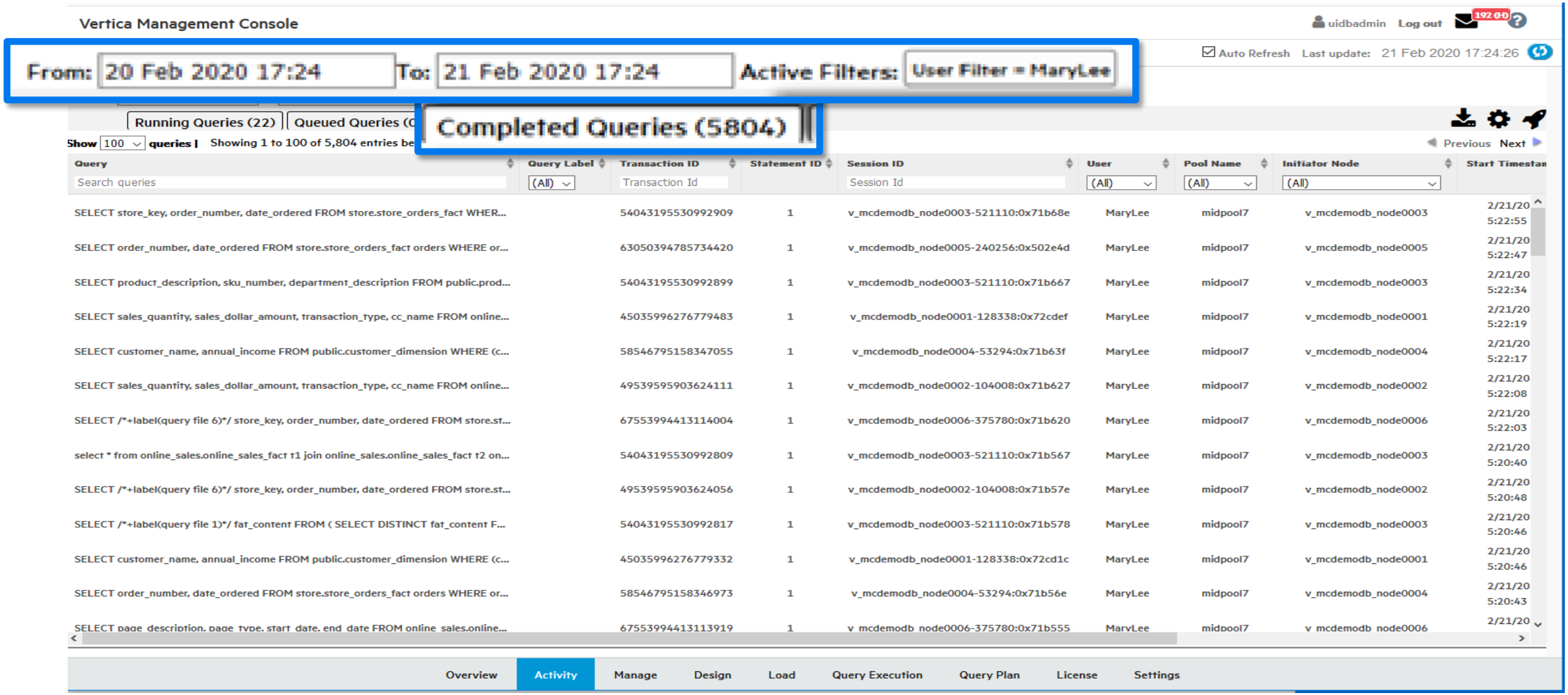

Activity Tab: Resource Pools Monitoring – Validation

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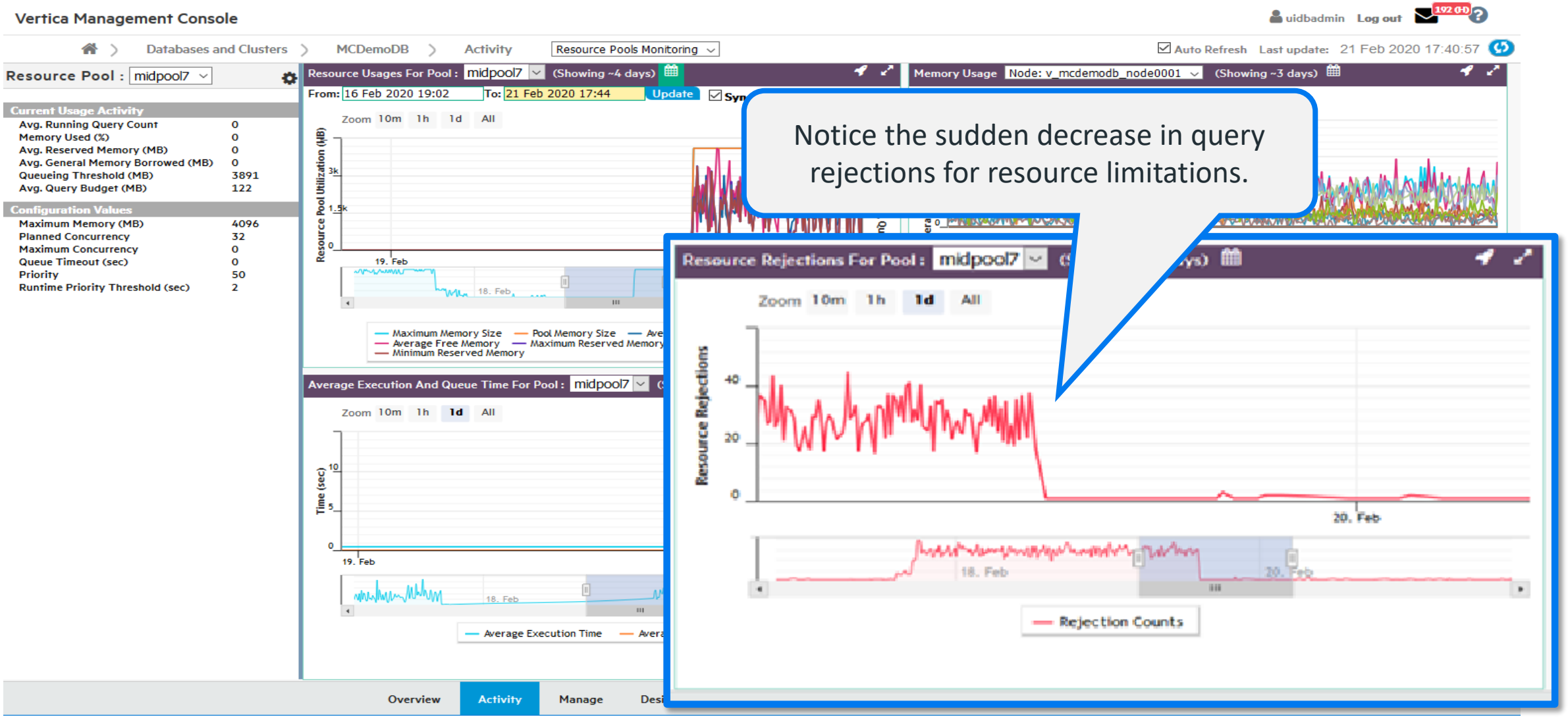

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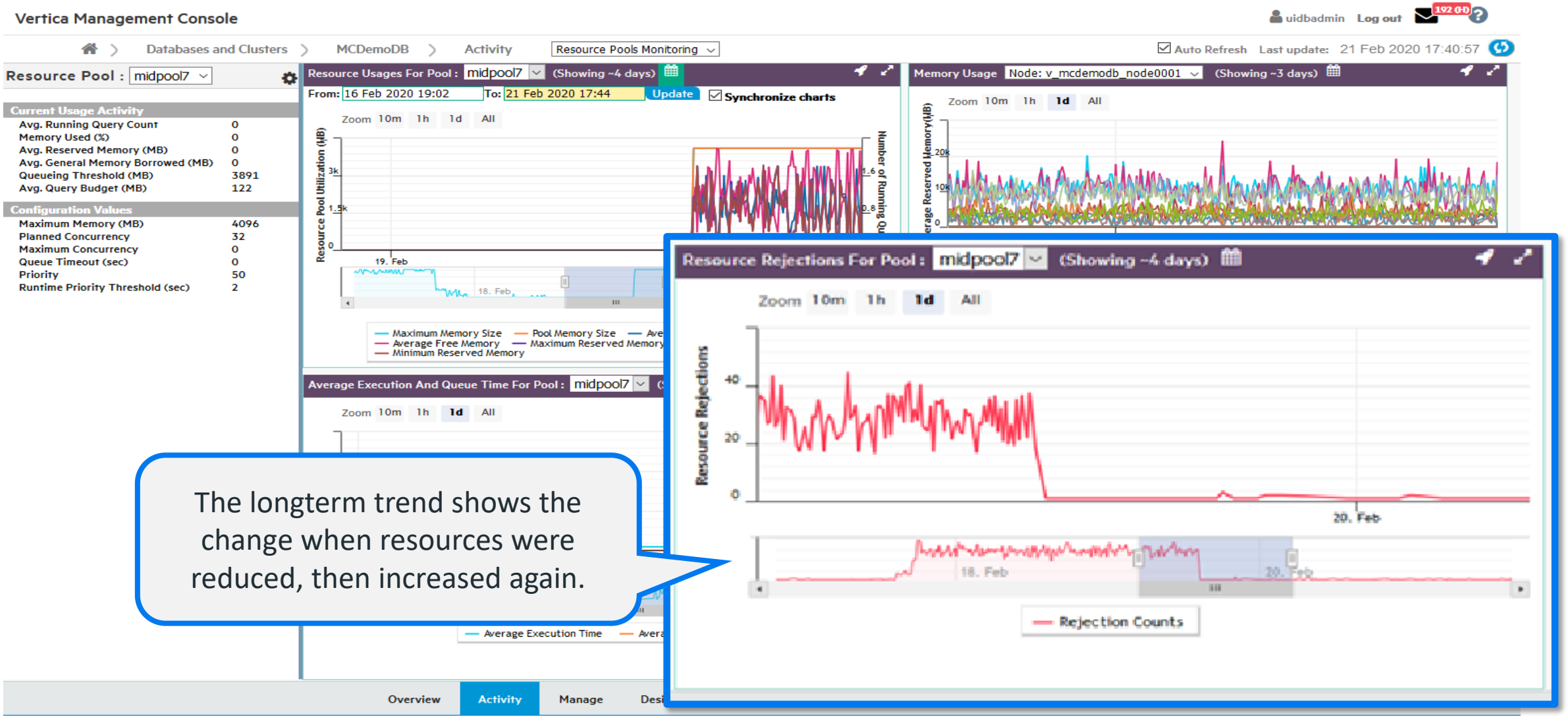

The longterm trend shows the change when resources were reduced, then increased again.

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Vertica in Eon Mode

- Provision and revive

Provisioning and Reviving an Eon Mode Database

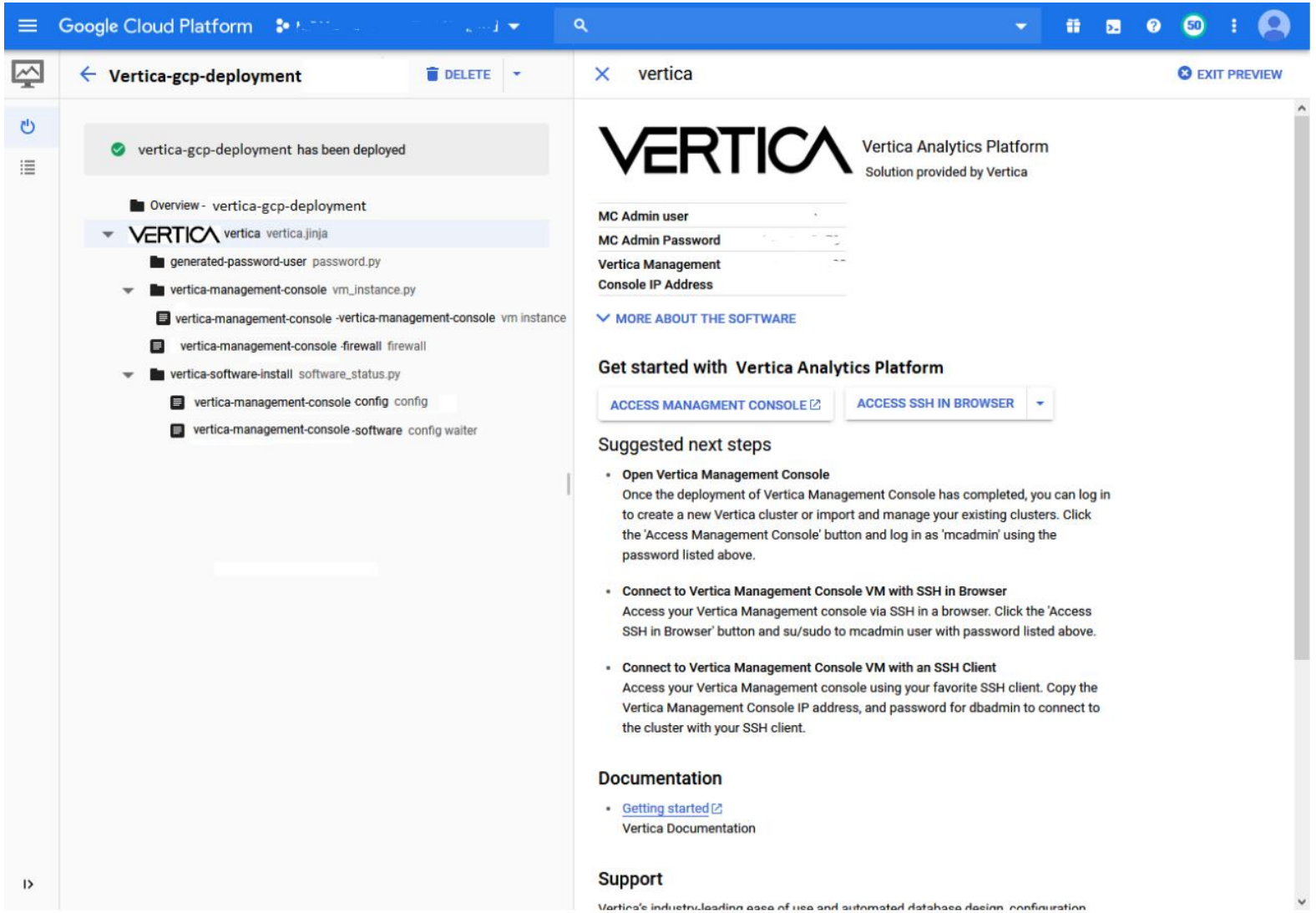
Many environments are supported including:

Provision Vertica Management Console

Provision Management Console from your environment

Such as

Google Cloud Platform



Provision Vertica Management Console

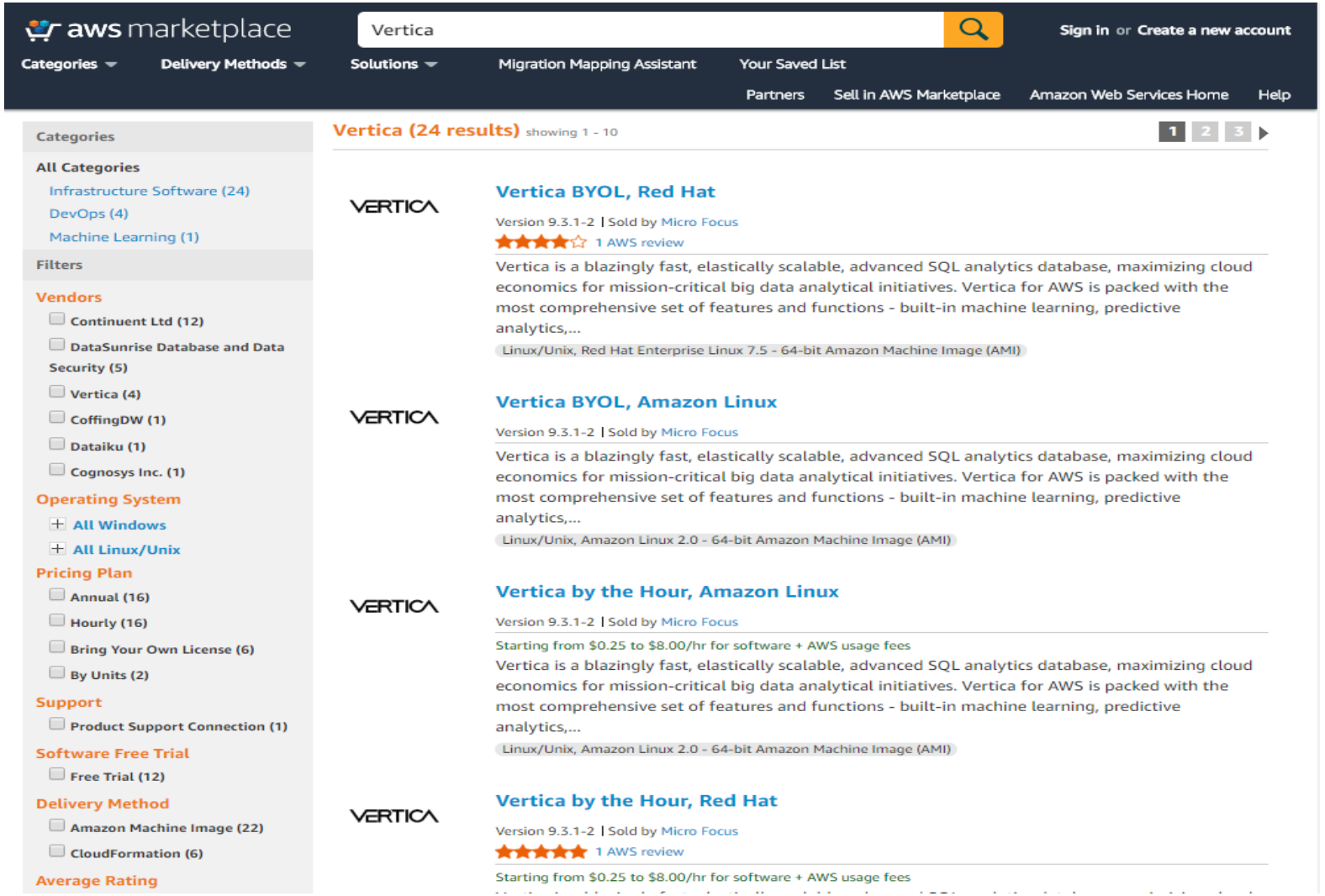
Provision Management Console from your environment

Such as

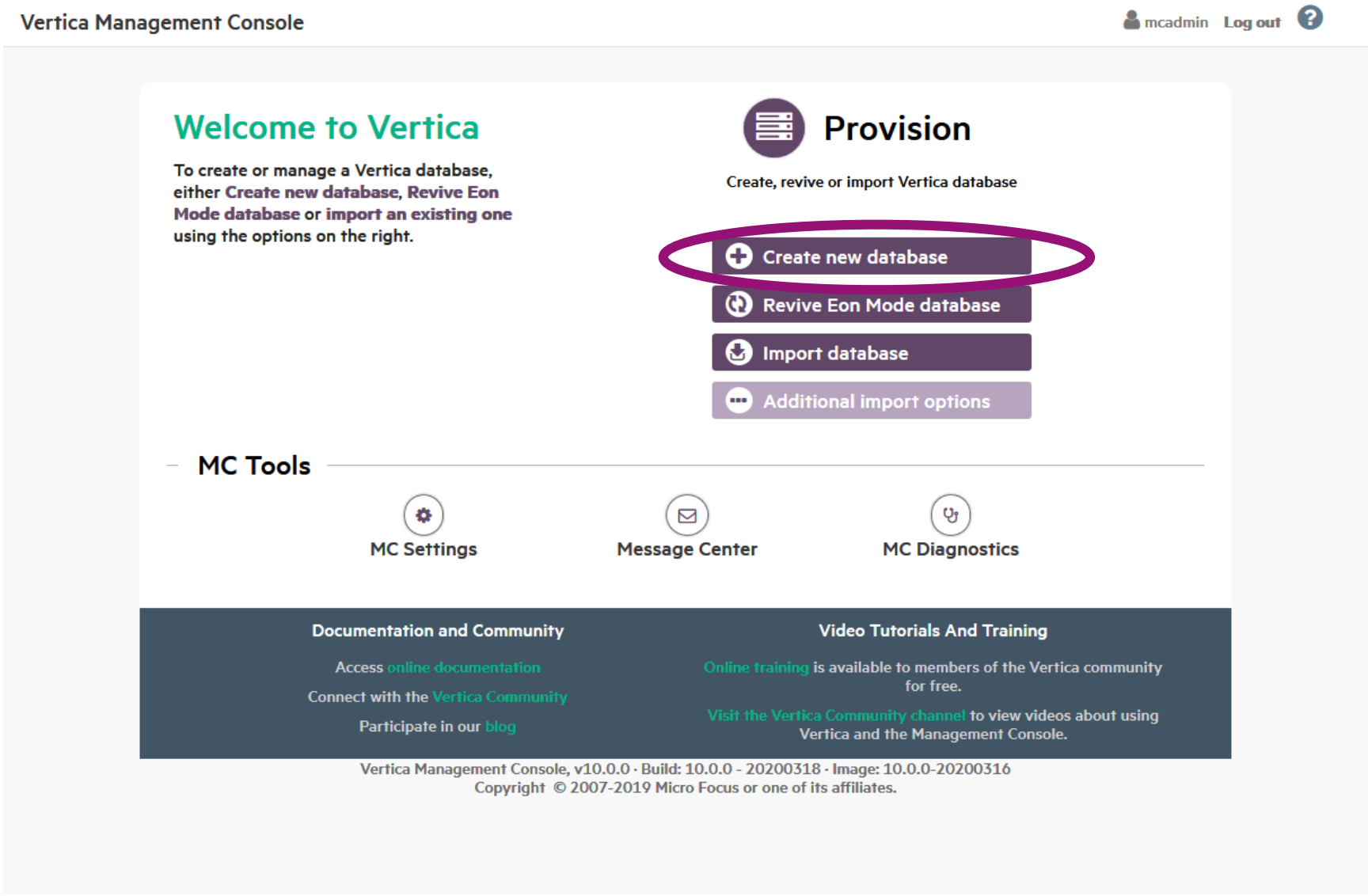
Google Cloud Platform

or

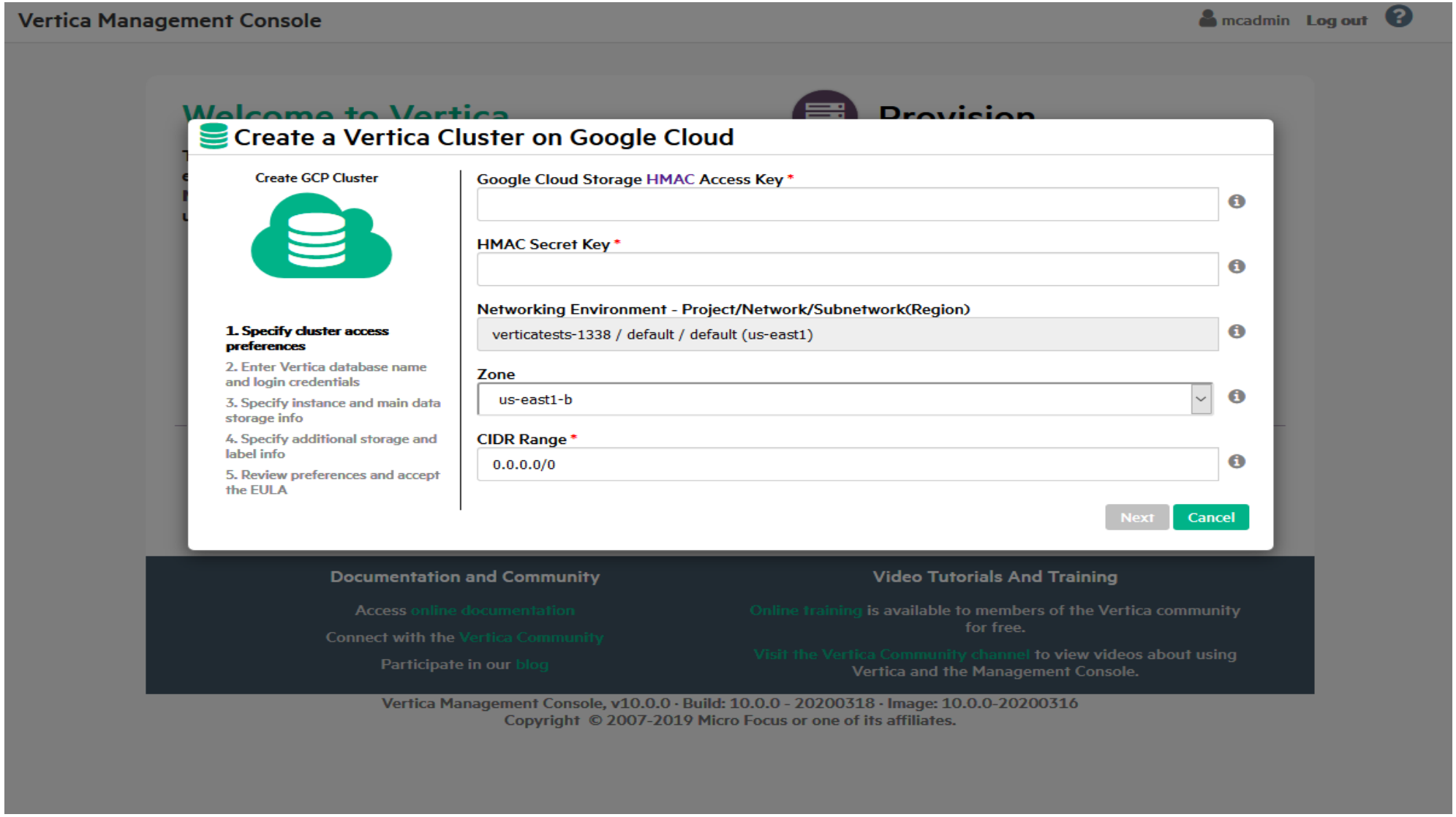
aws



Provision Vertica Database



Provision Vertica Database



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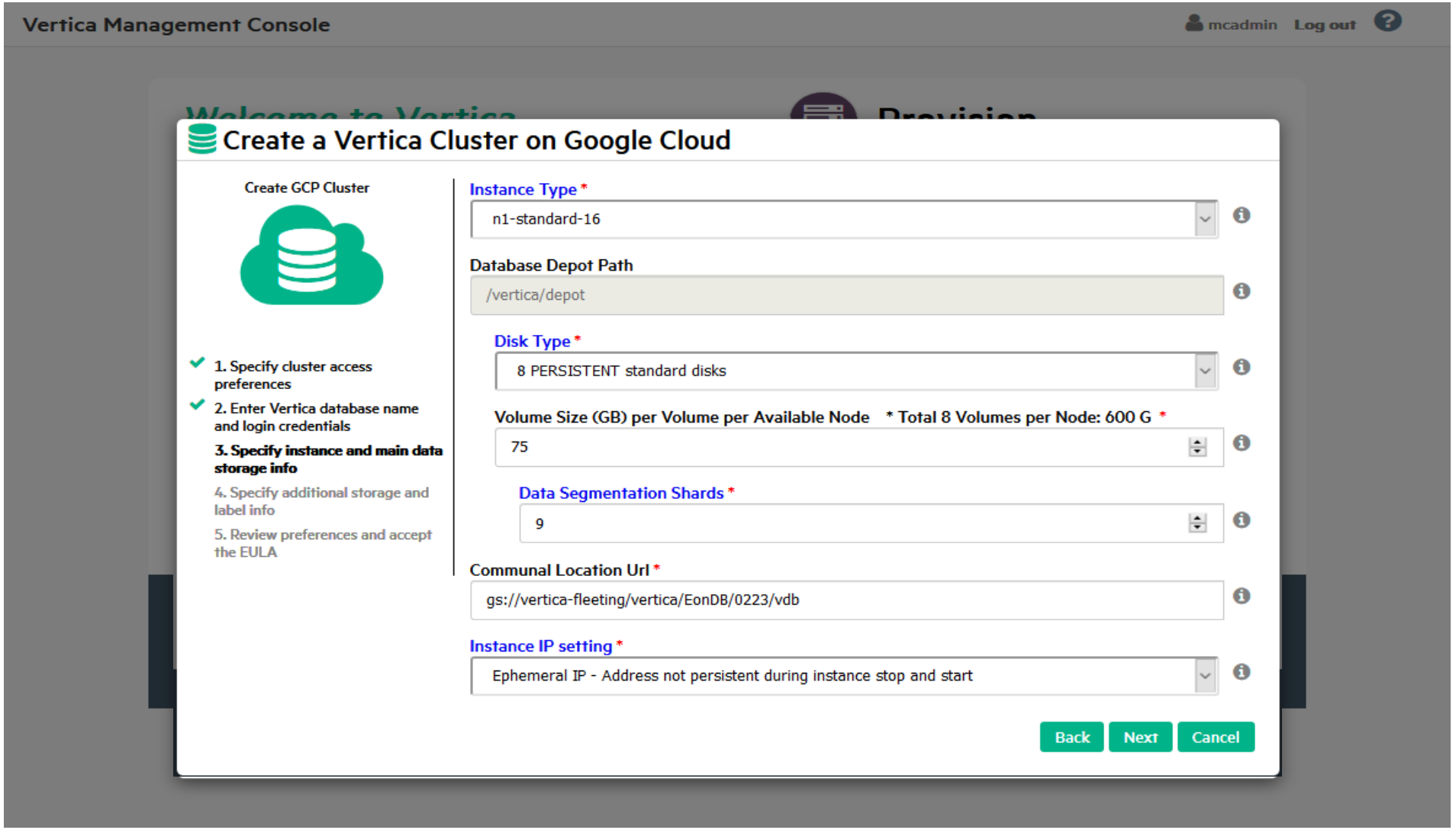
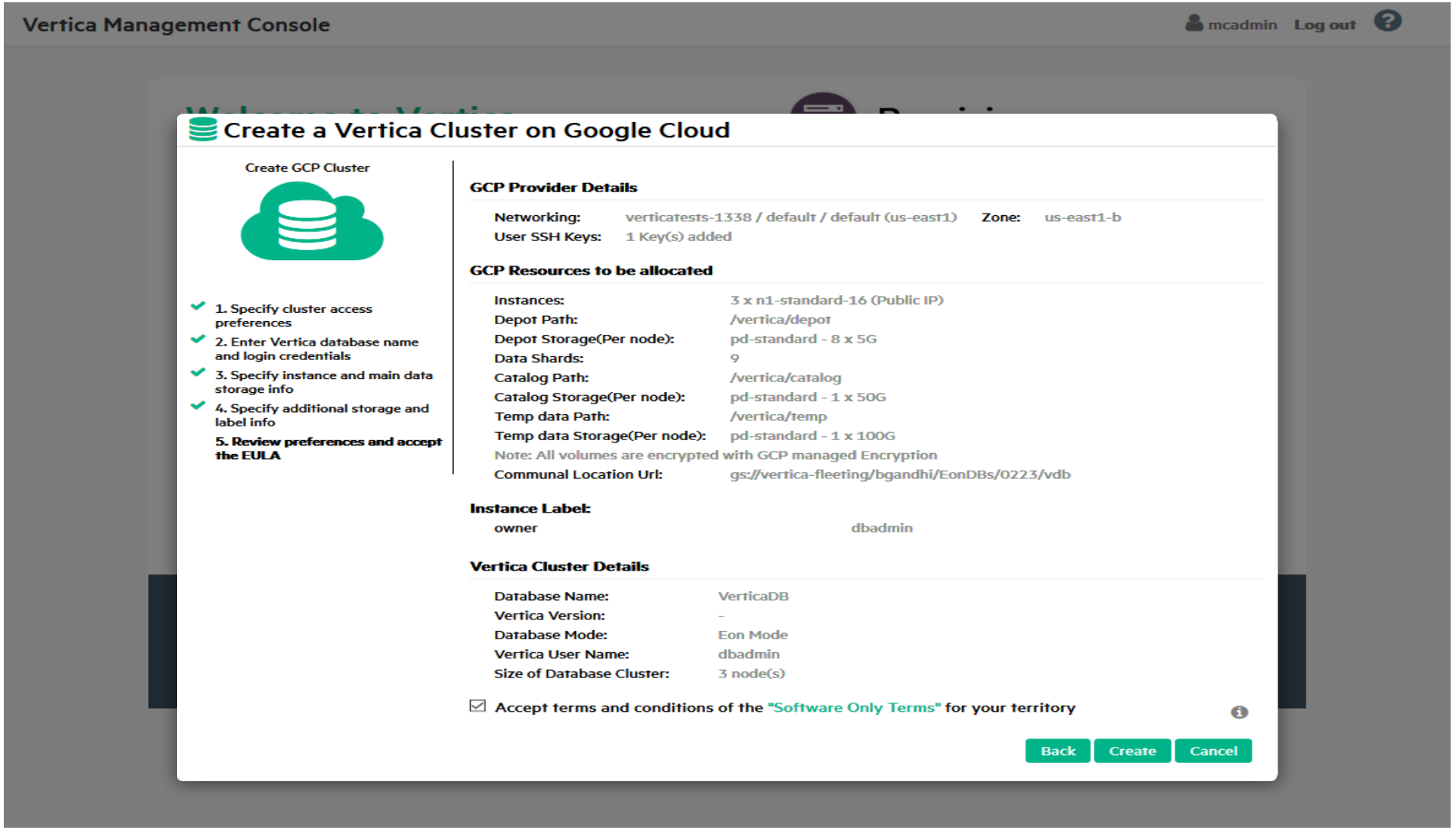
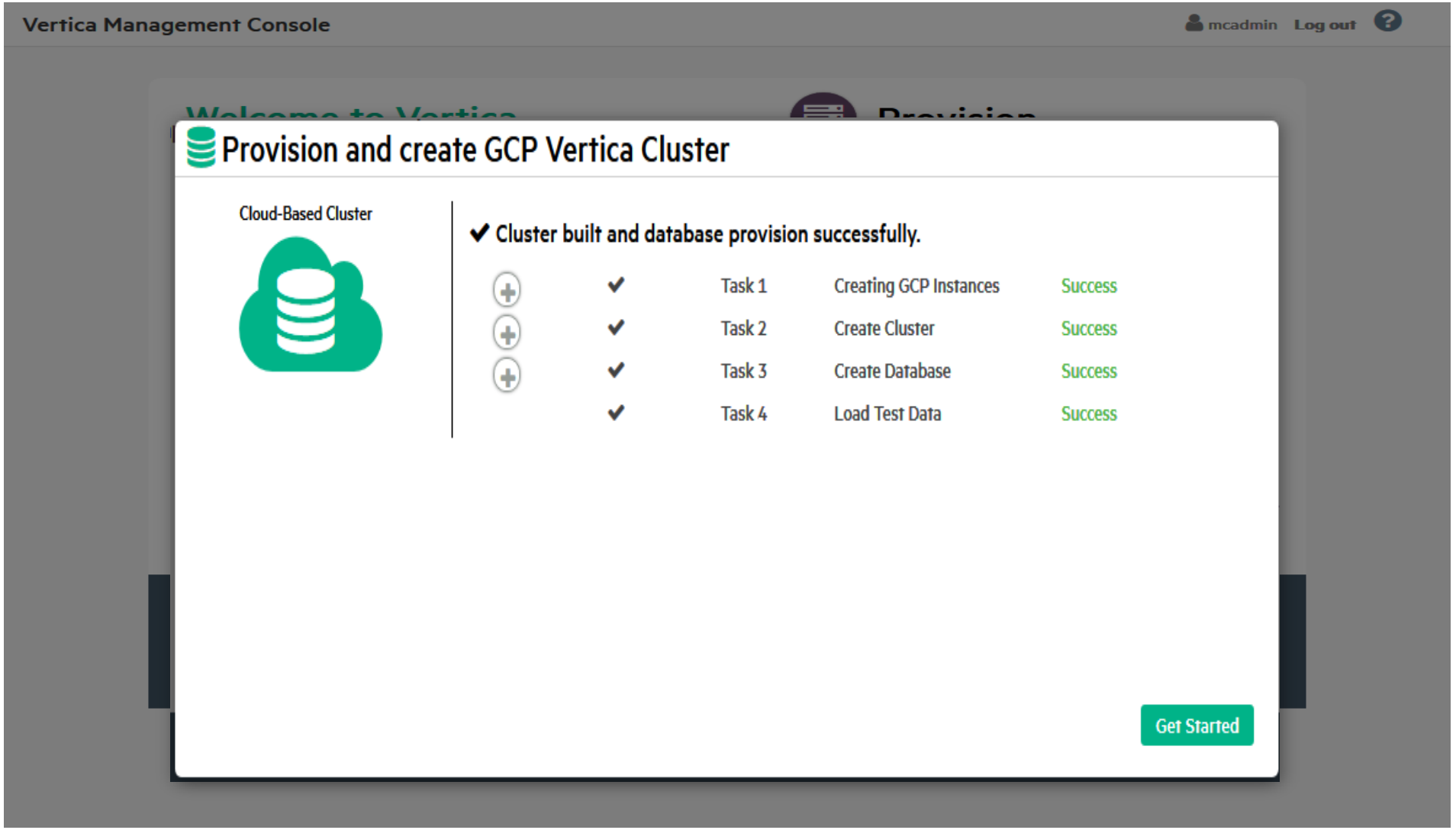


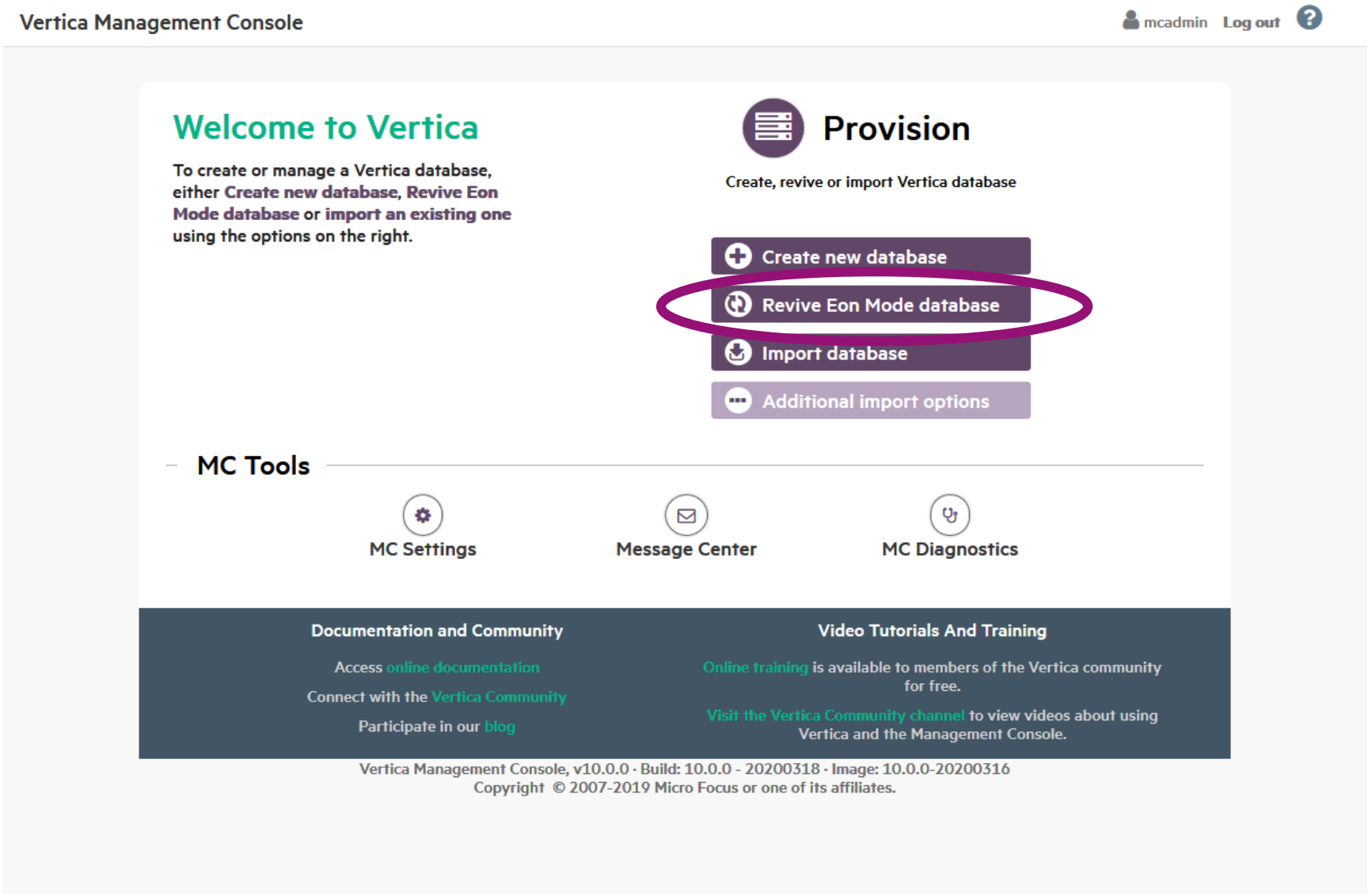
Provision Vertica Database



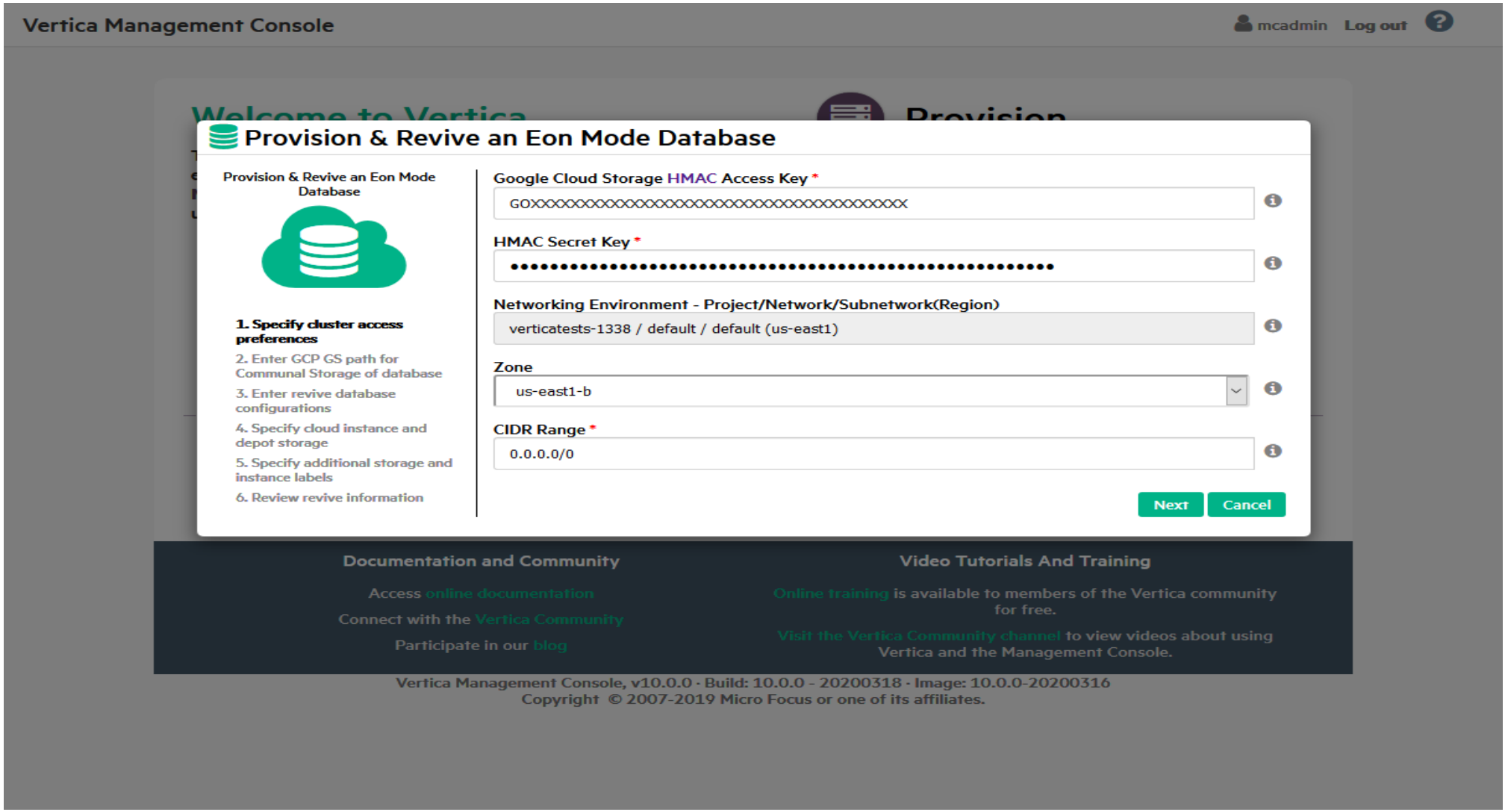
Provision Vertica Database



Revive Vertica Database



Revive Vertica database



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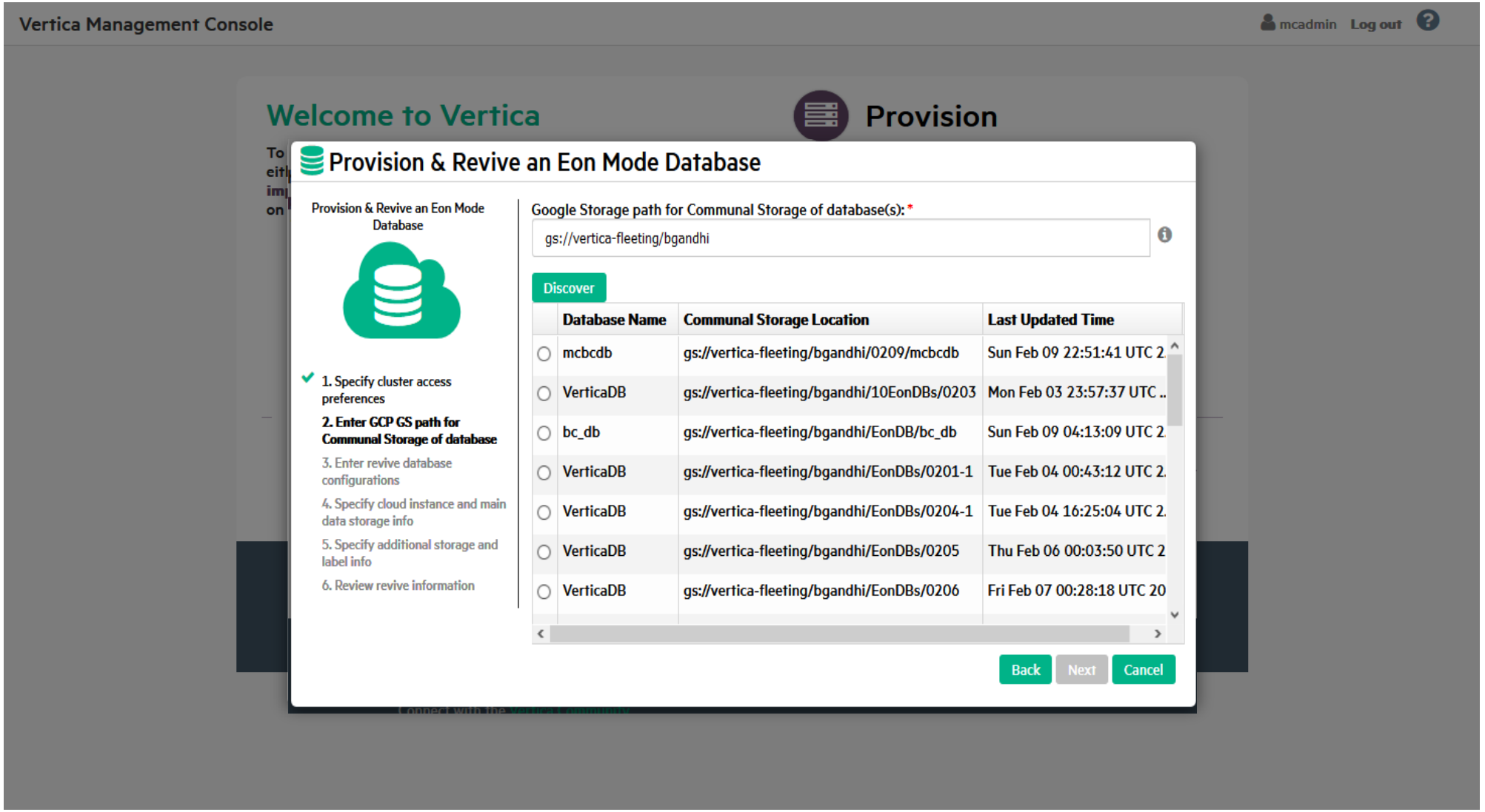

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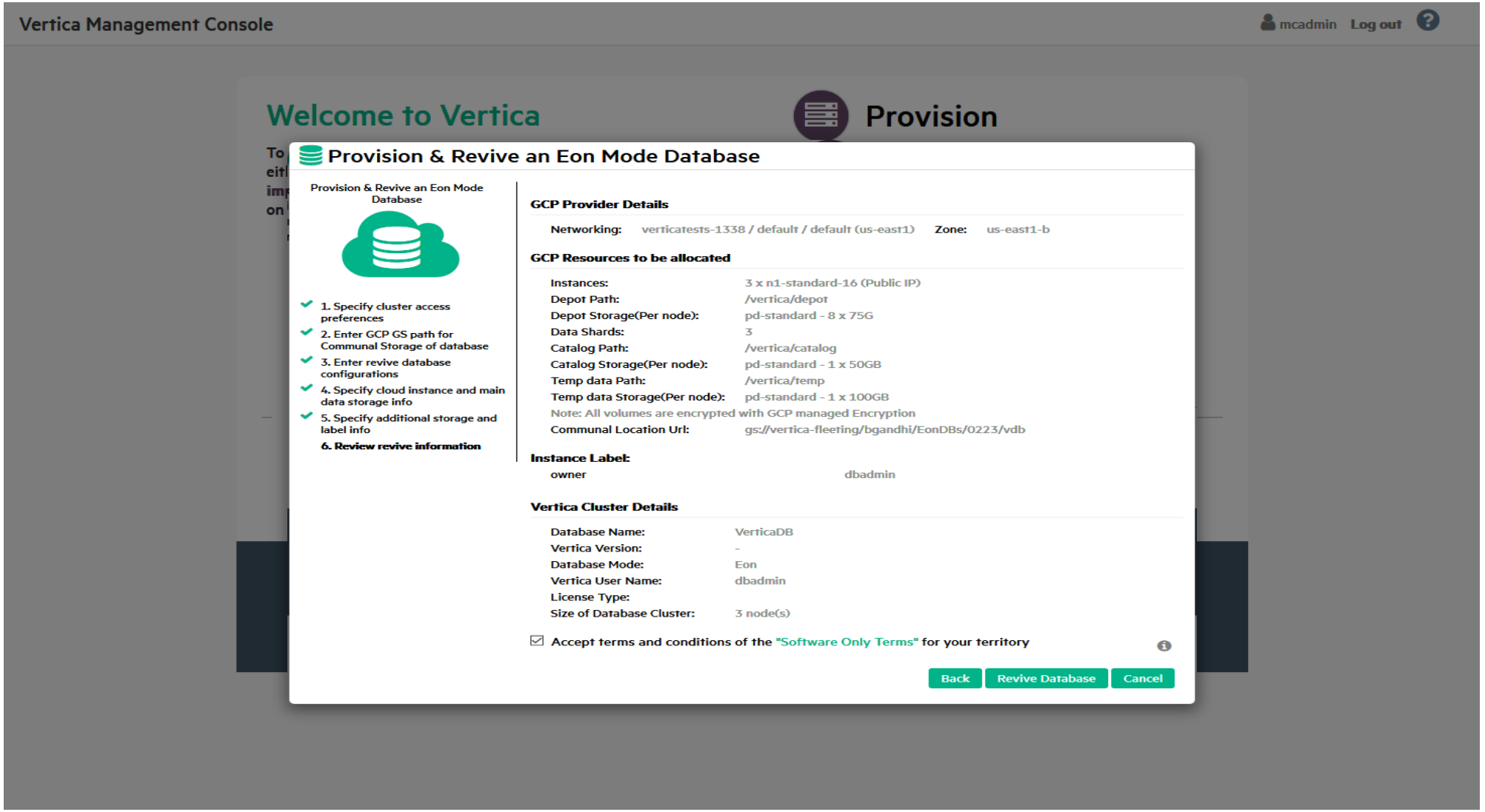

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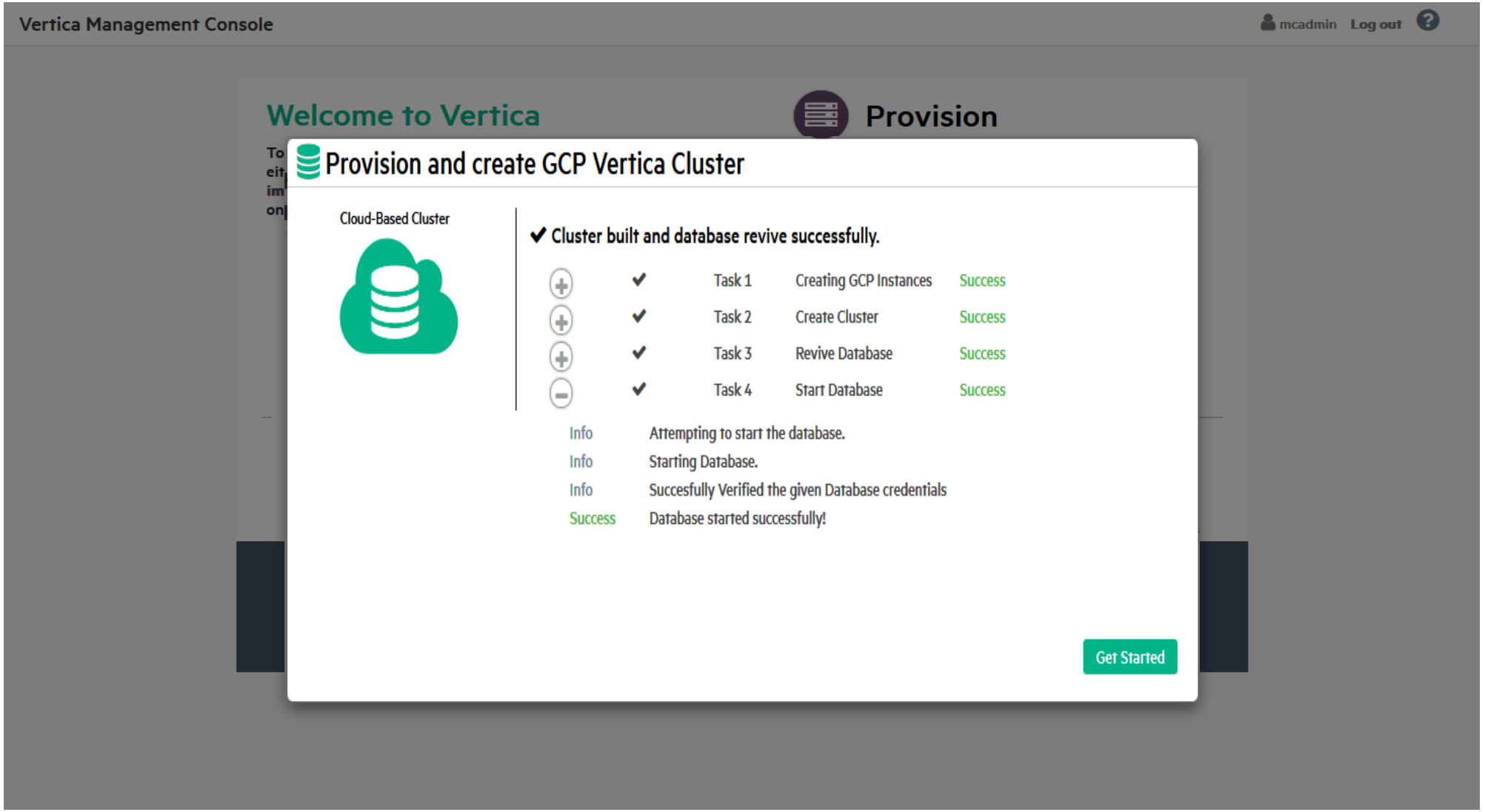
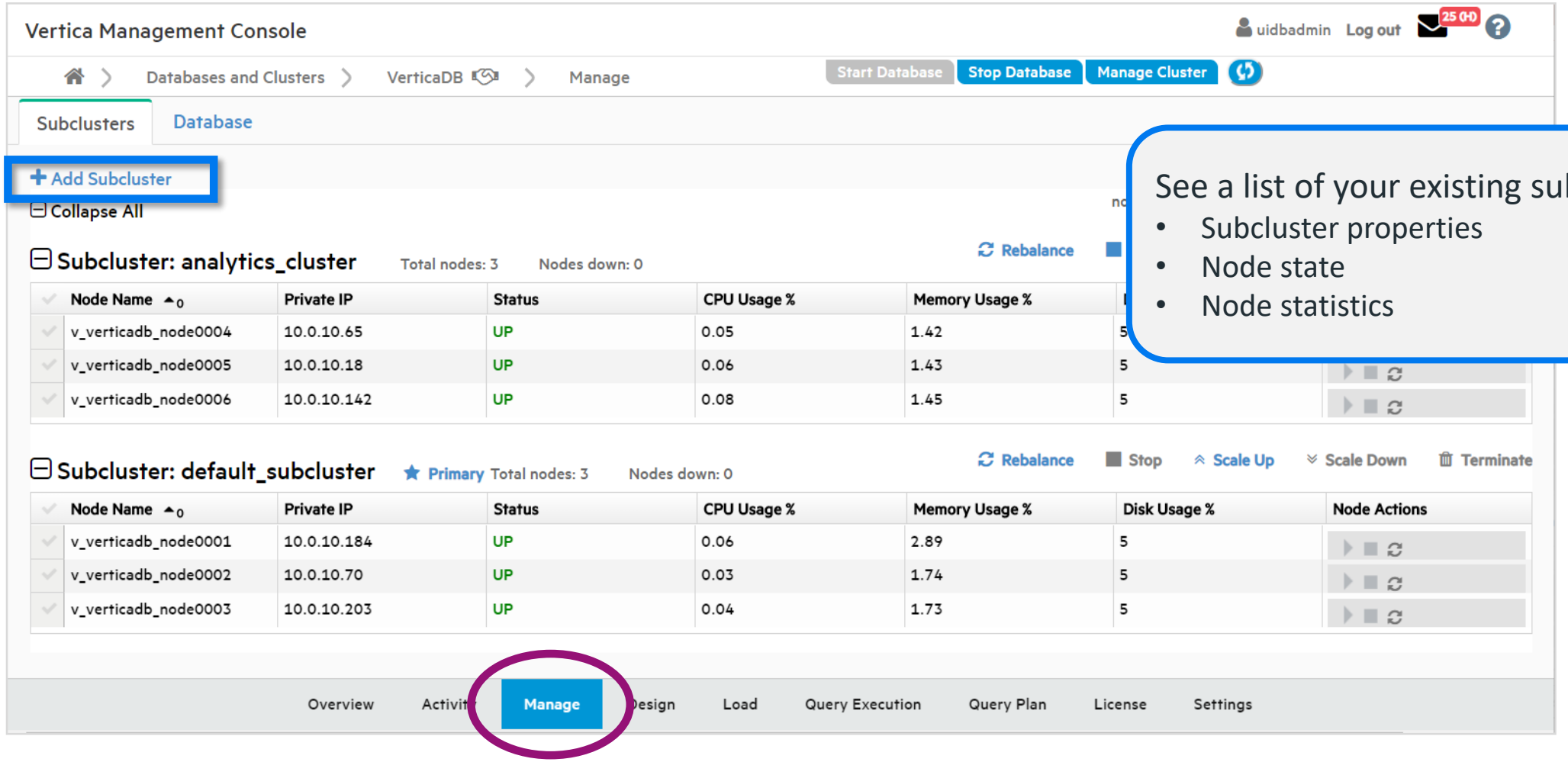


Vertica in Eon Mode

- Provision and revive
- **Manage subclusters**

Natalia Stavisky, Vertica MC Developer

Management Tab: Easily Use and Manage Subclusters



See a list of your existing subclusters

- Subcluster properties
- Node state
- Node statistics

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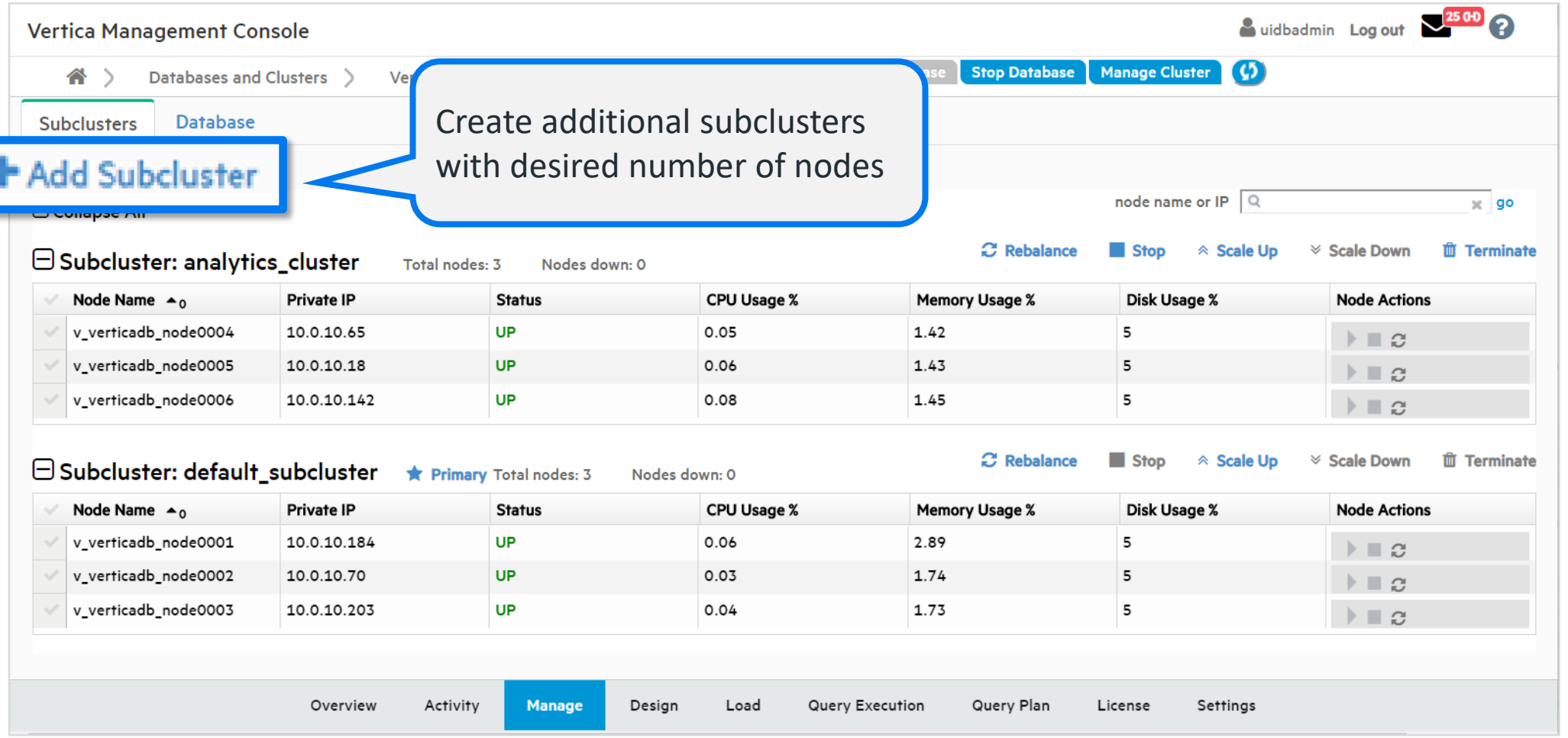
Management Tab: Easily Use and Manage Subclusters



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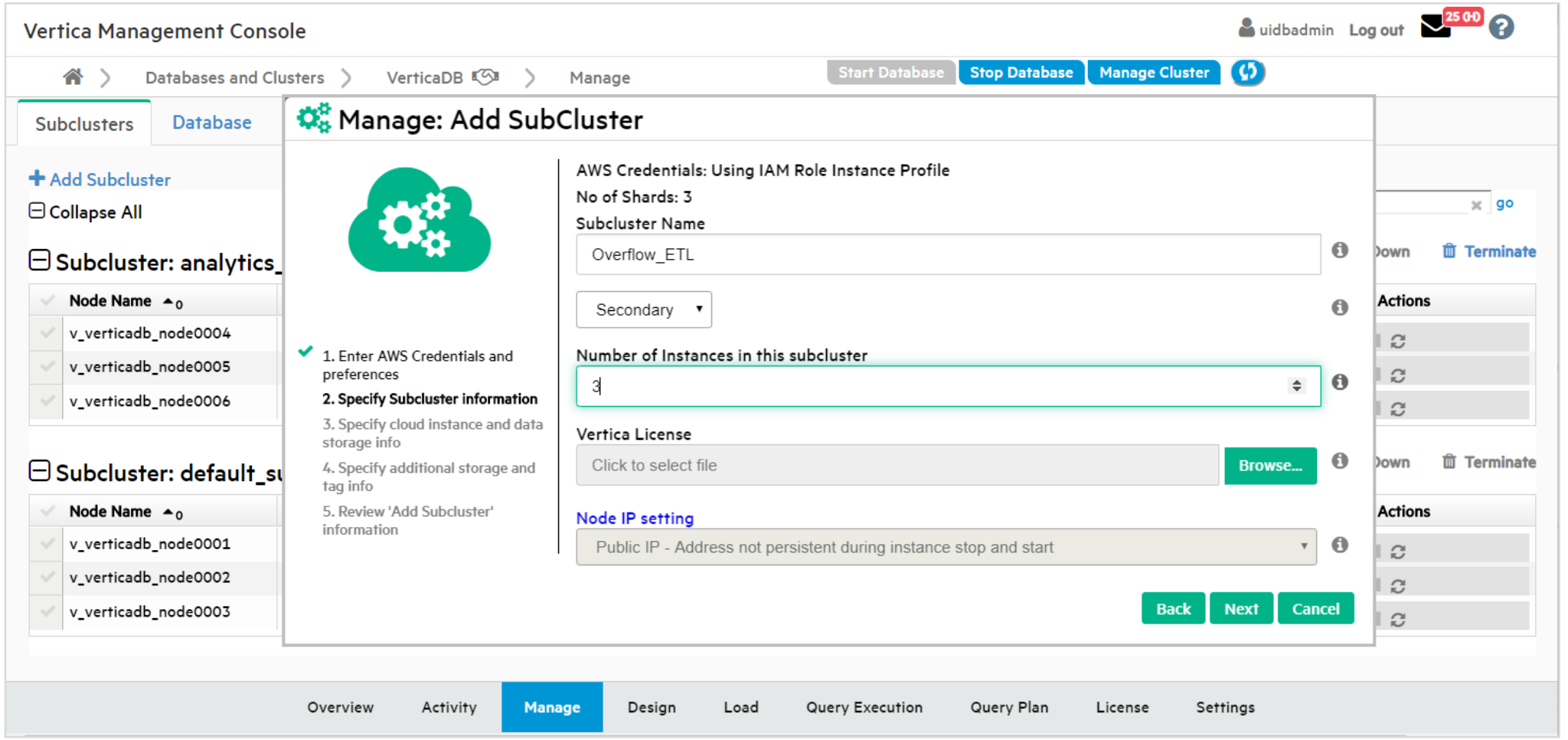

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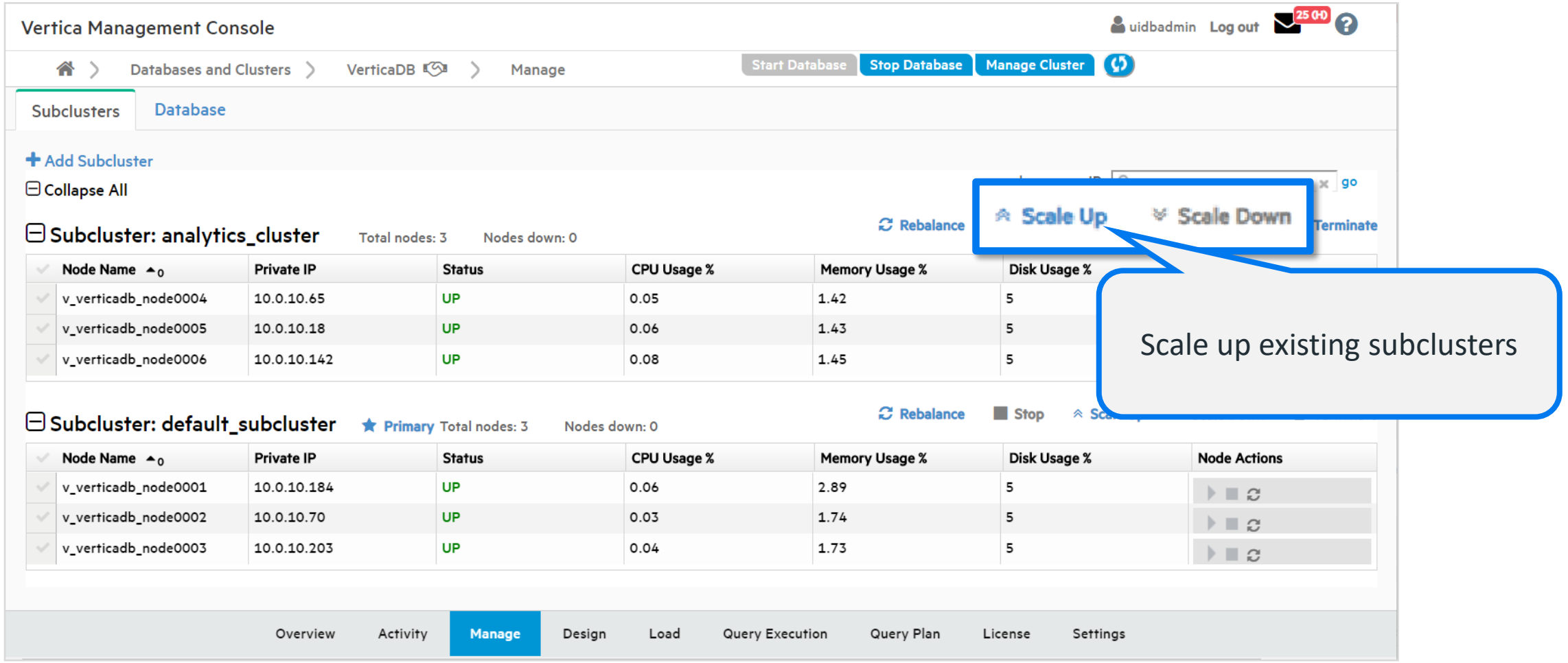

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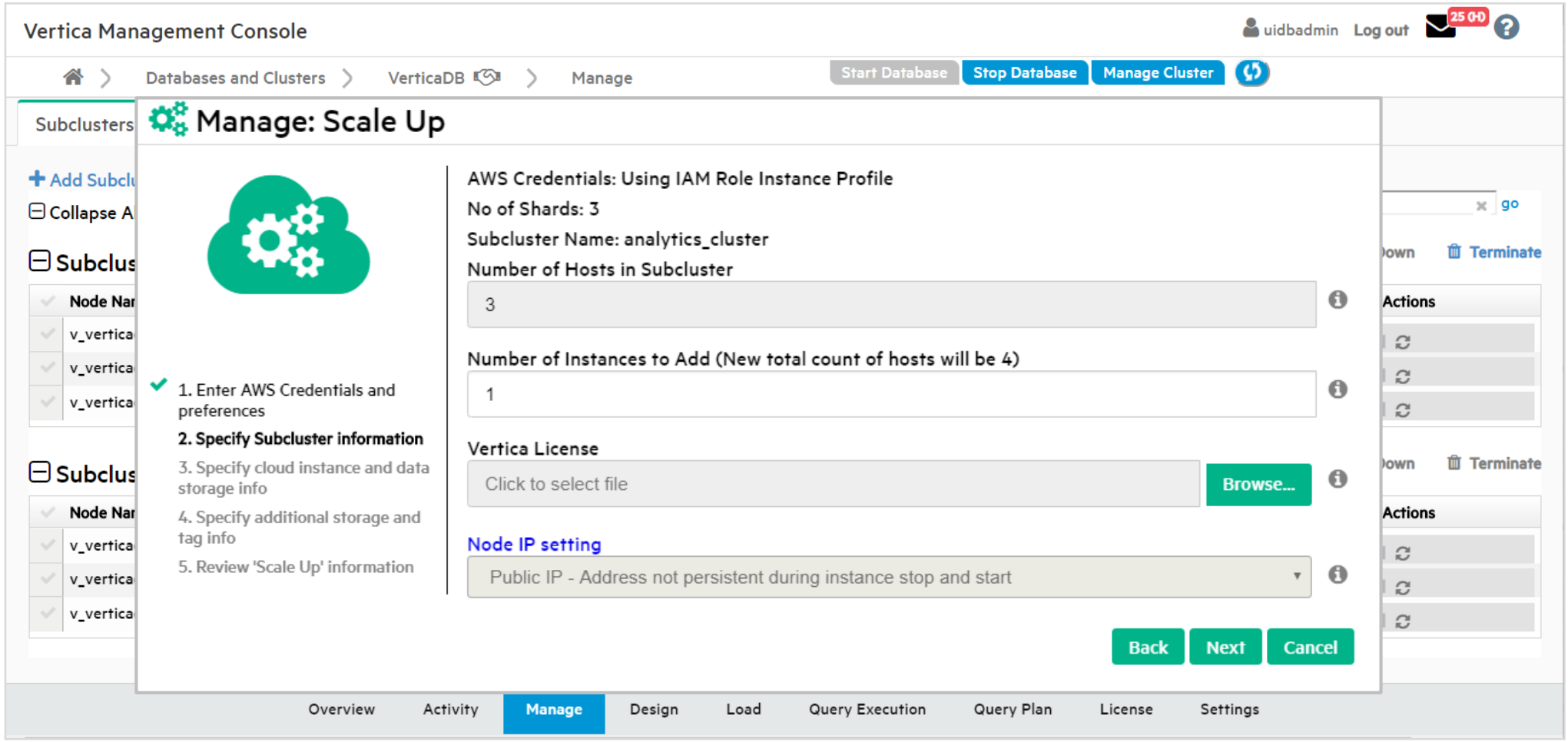

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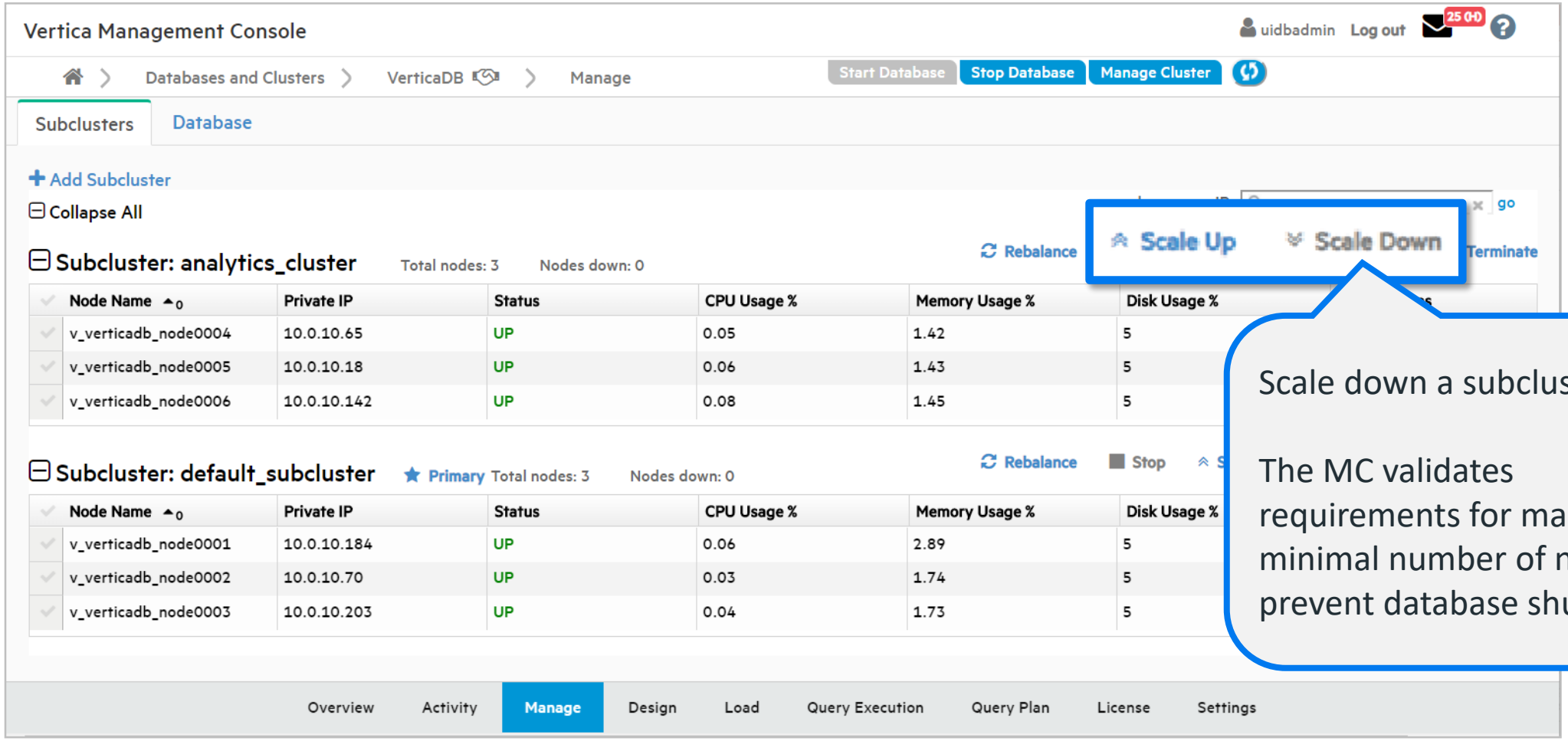

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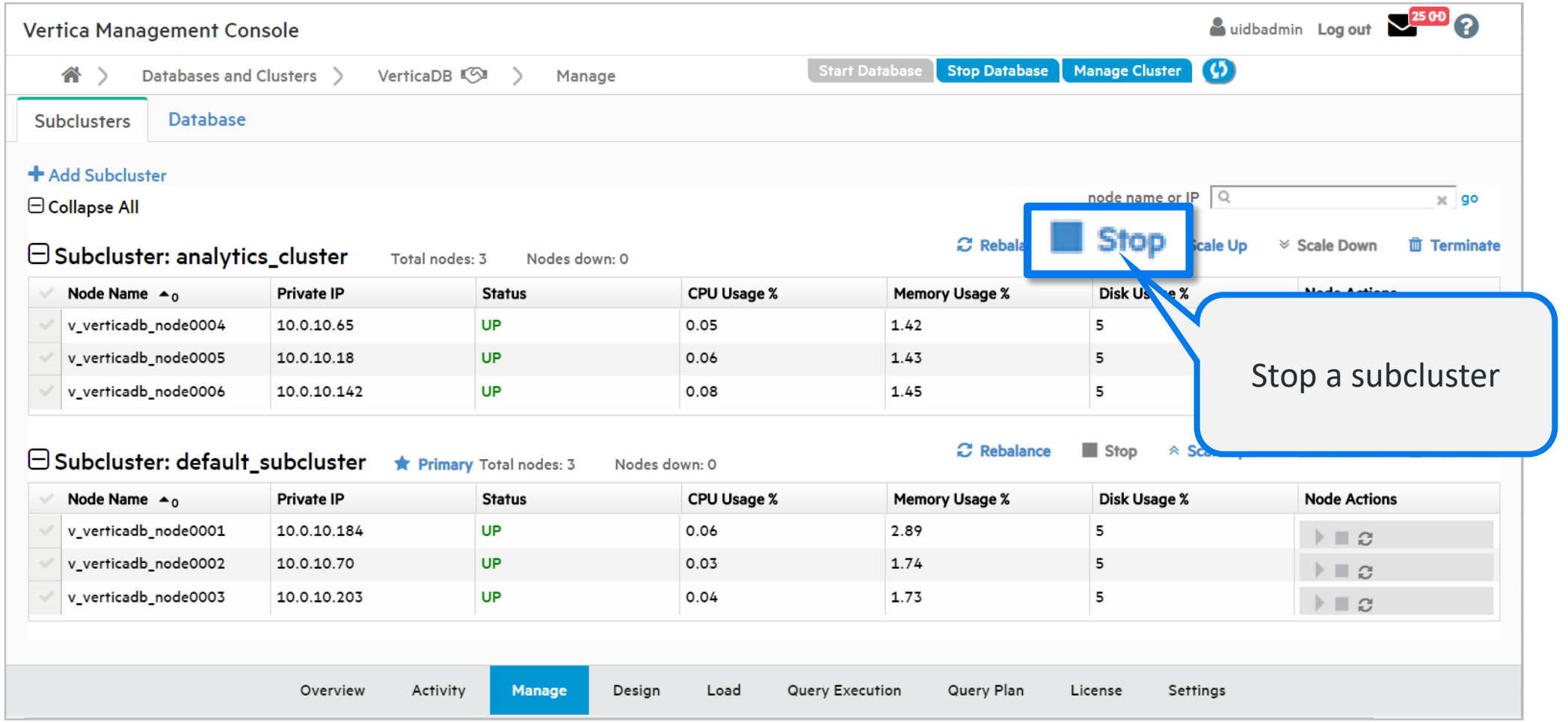

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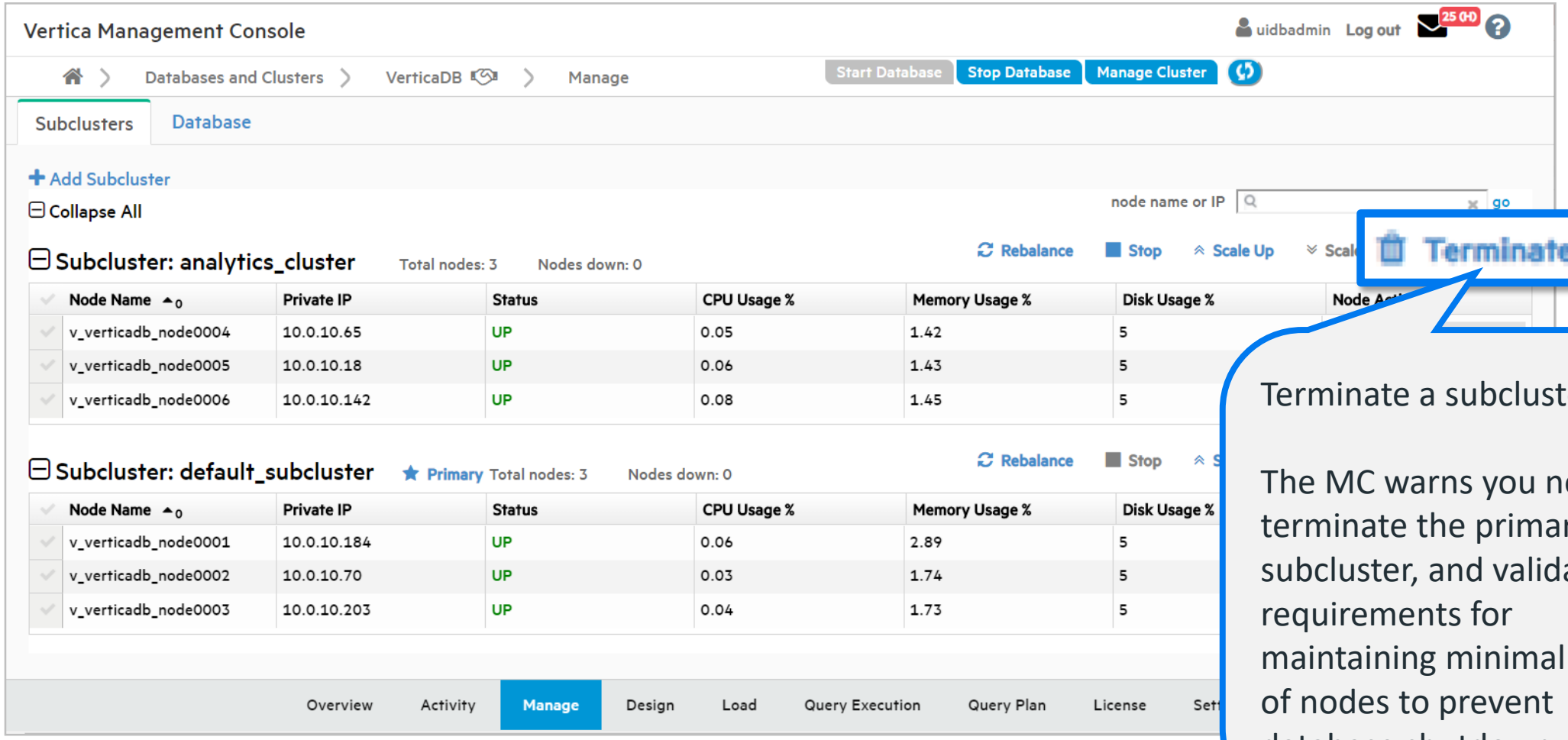


Terminate a subcluster.

The MC warns you not to terminate the primary subcluster, and validates requirements for maintaining minimal number of nodes to prevent database shutdown

Vertica in Eon Mode

- Provision and revive
- Manage subclusters
- **Understand your depot**

How can MC help you understand Depot performance?

What are the most important questions about Depot?

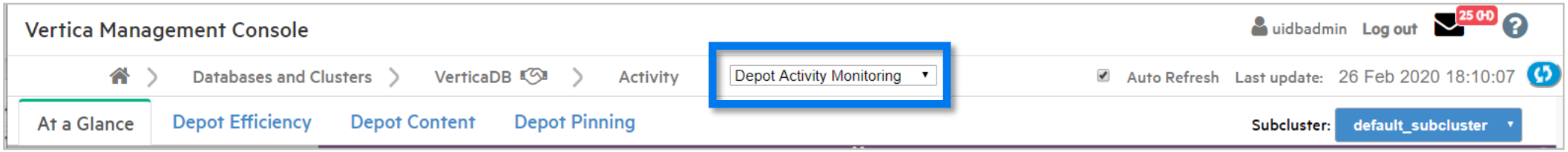
-Is the Depot size sufficient?

-Are a subset of users putting a high load on the database?

-What tables are fetched and evicted repeatedly (“refetched”) in Depot?

Depot Activity Monitoring page:

- See Depot configuration
- Evaluate Depot efficiency
- View Depot content
- Pin objects to Depot
- All in context of a subcluster



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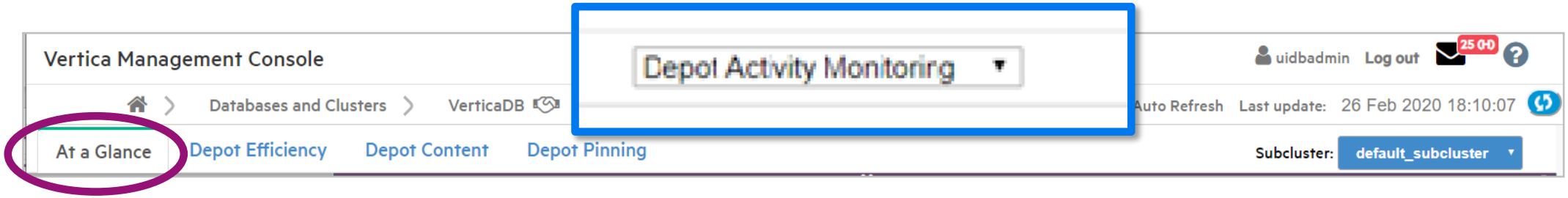

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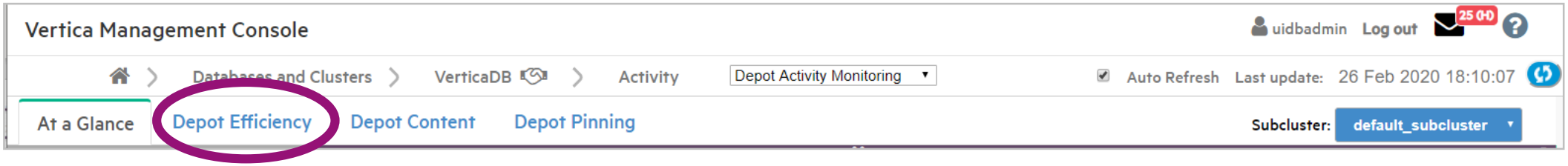

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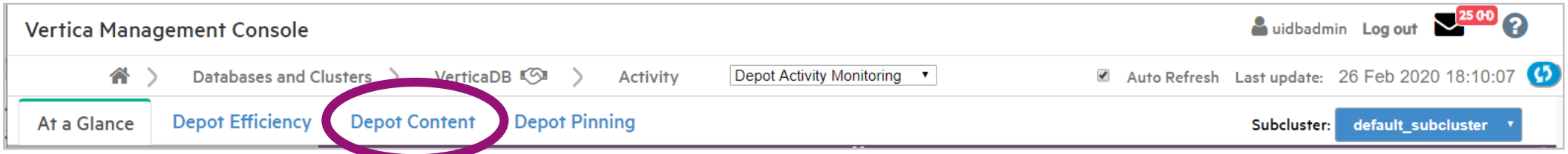

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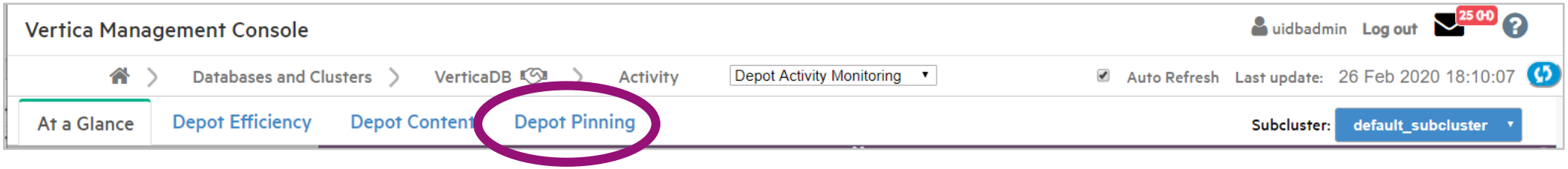
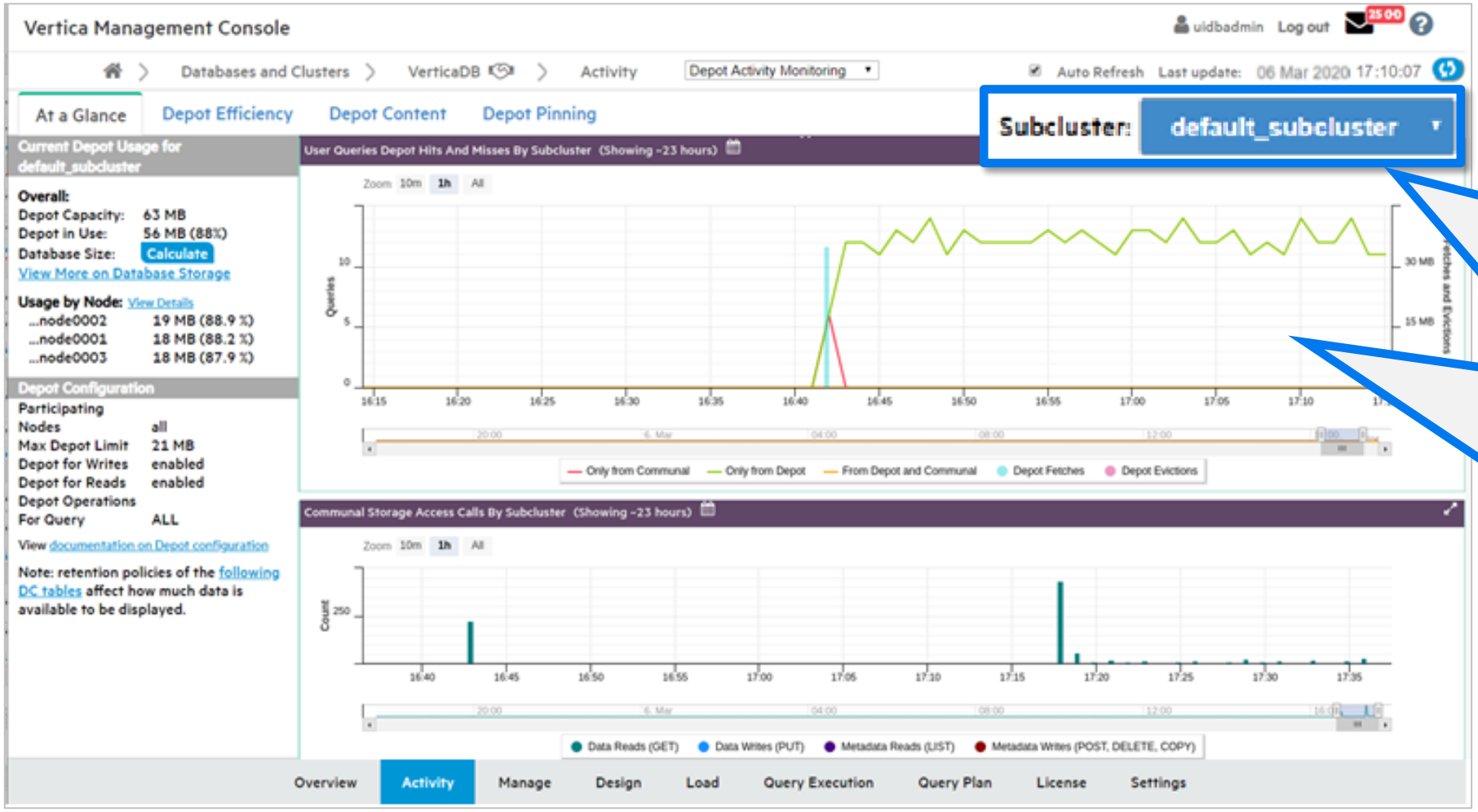


At a Glance: Monitor performance of workloads on one subcluster



default_subcluster

has 2 users running queries that are accessing tables in schema ‘public’

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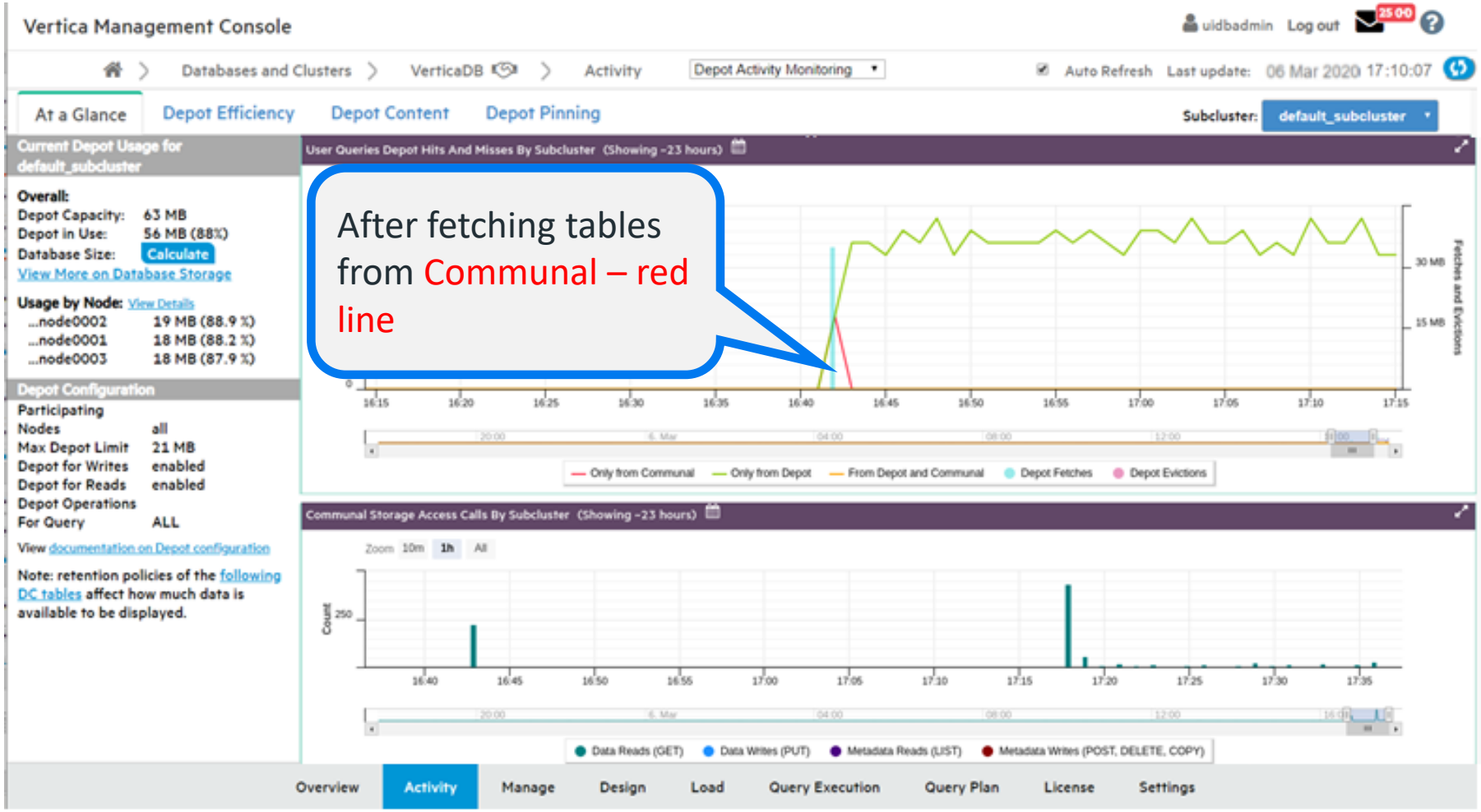
At a Glance: Monitor performance of workloads on one subcluster



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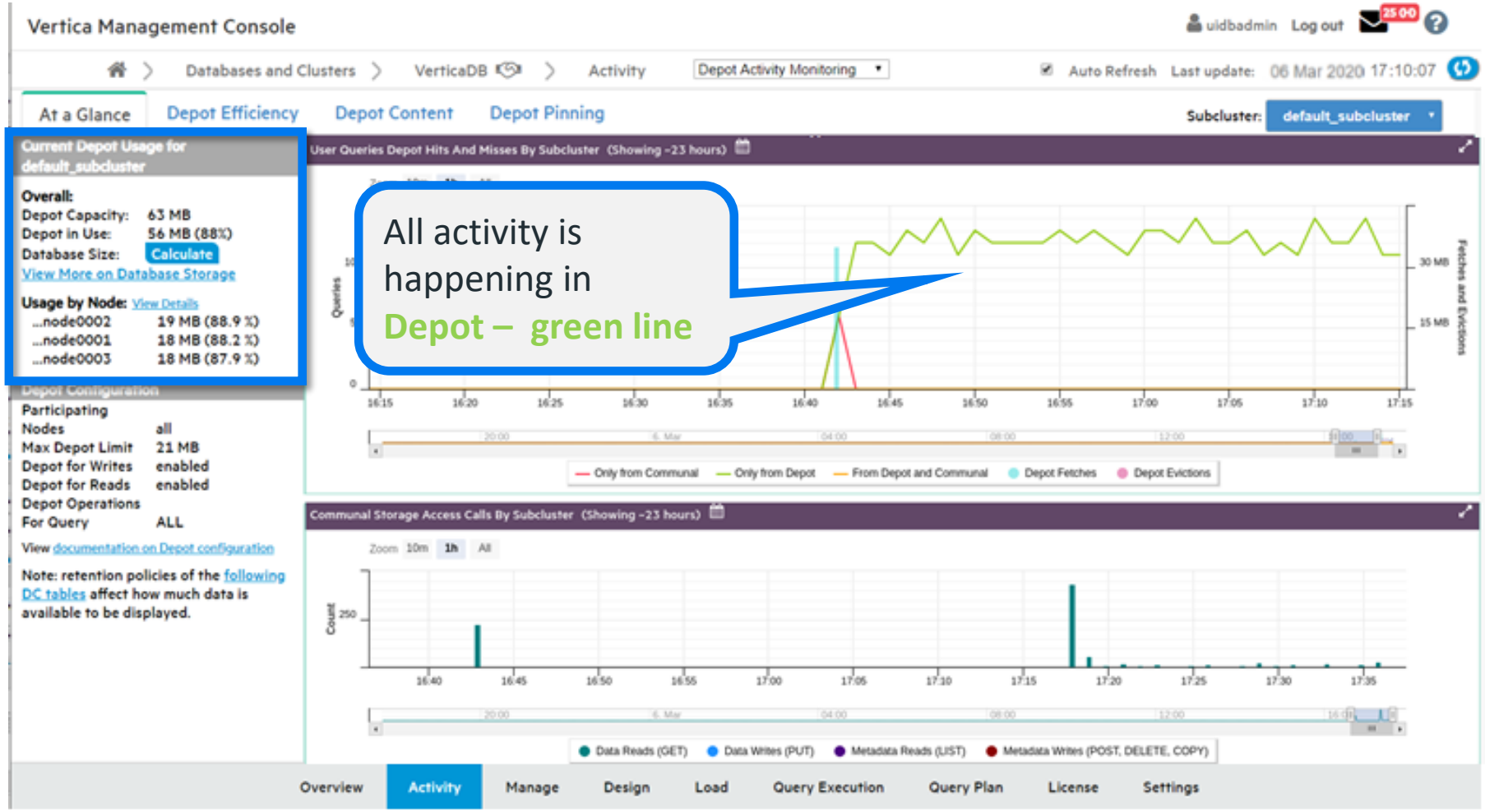

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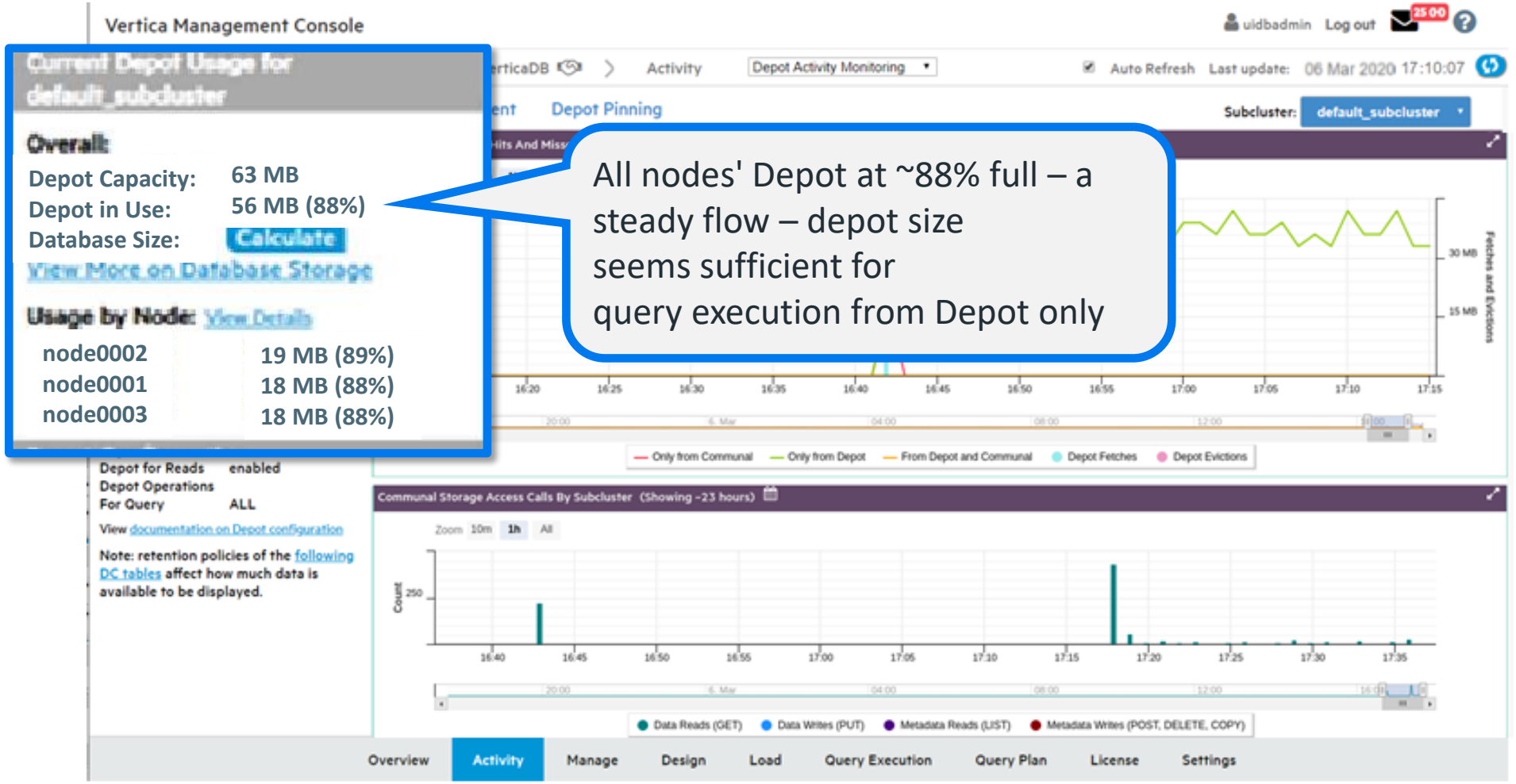
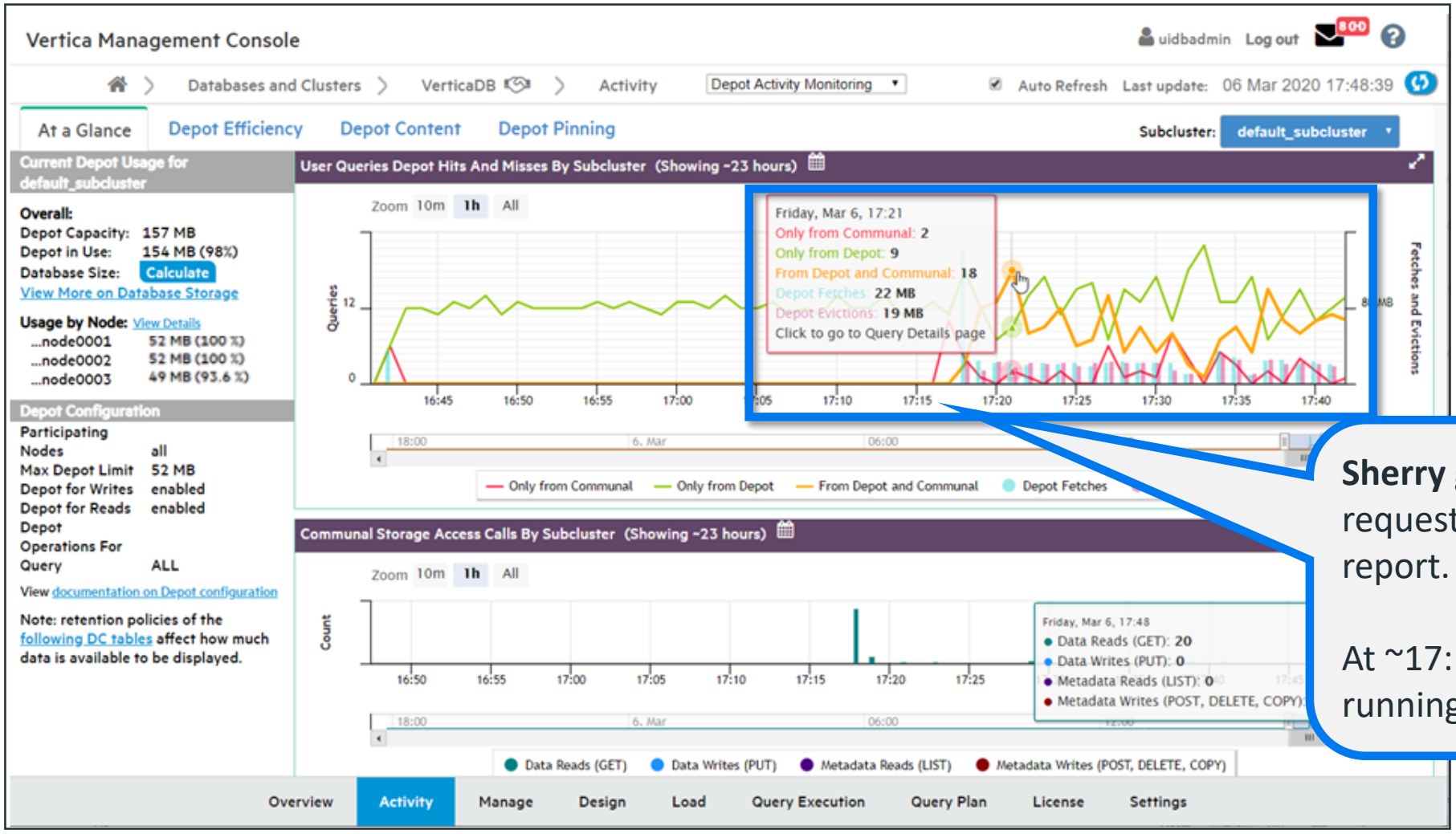


At a Glance: Adding a new workload



Sherry got an urgent request to generate a report.

At ~17:15 she started running her queries.

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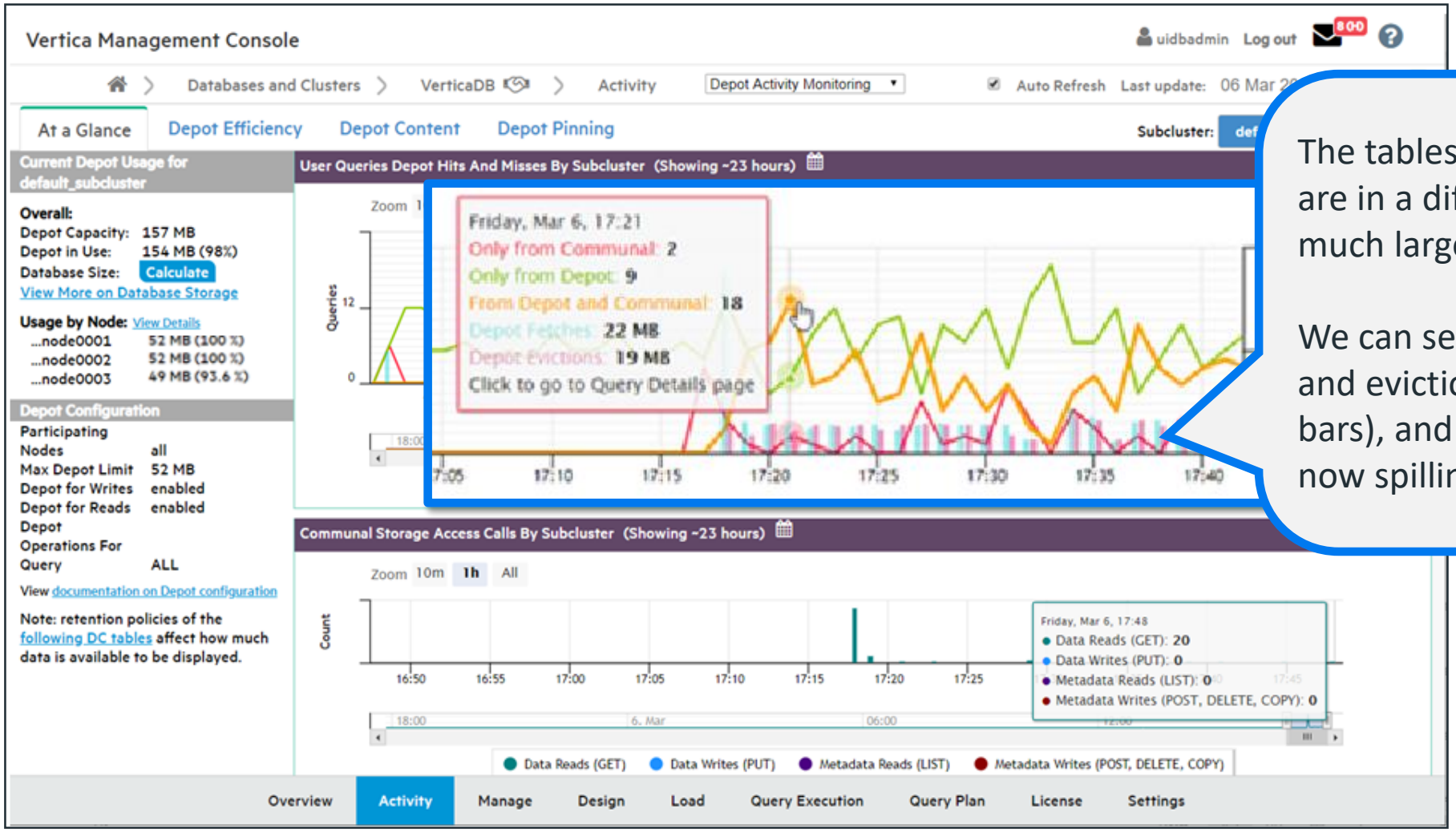
At a Glance: Adding a new workload



The tables Sherry is querying are in a different schema and much larger.

We can see a bunch of fetches and evictions (**blue** and **purple** bars), and a lot of queries are now spilling into Communal.

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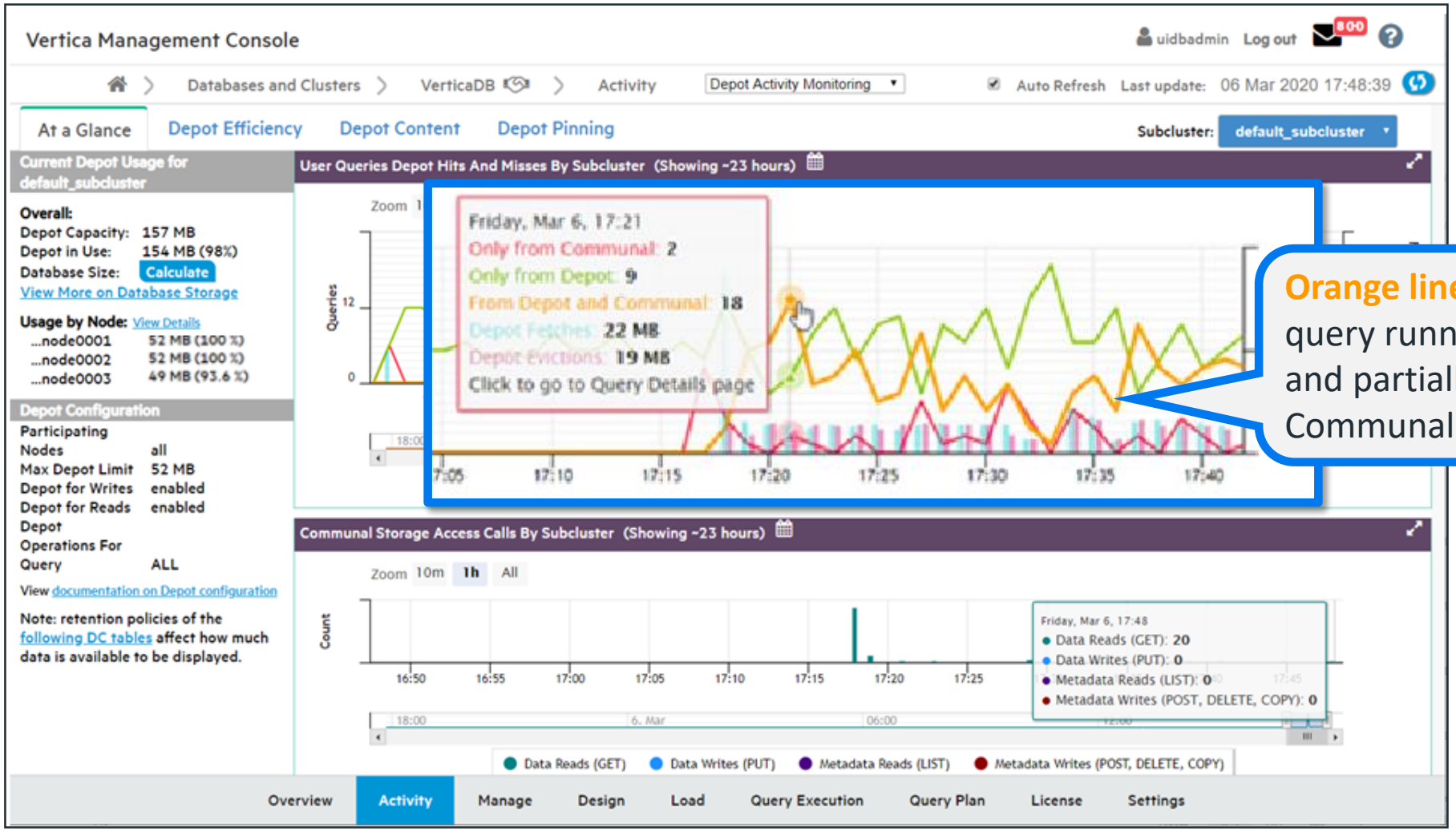
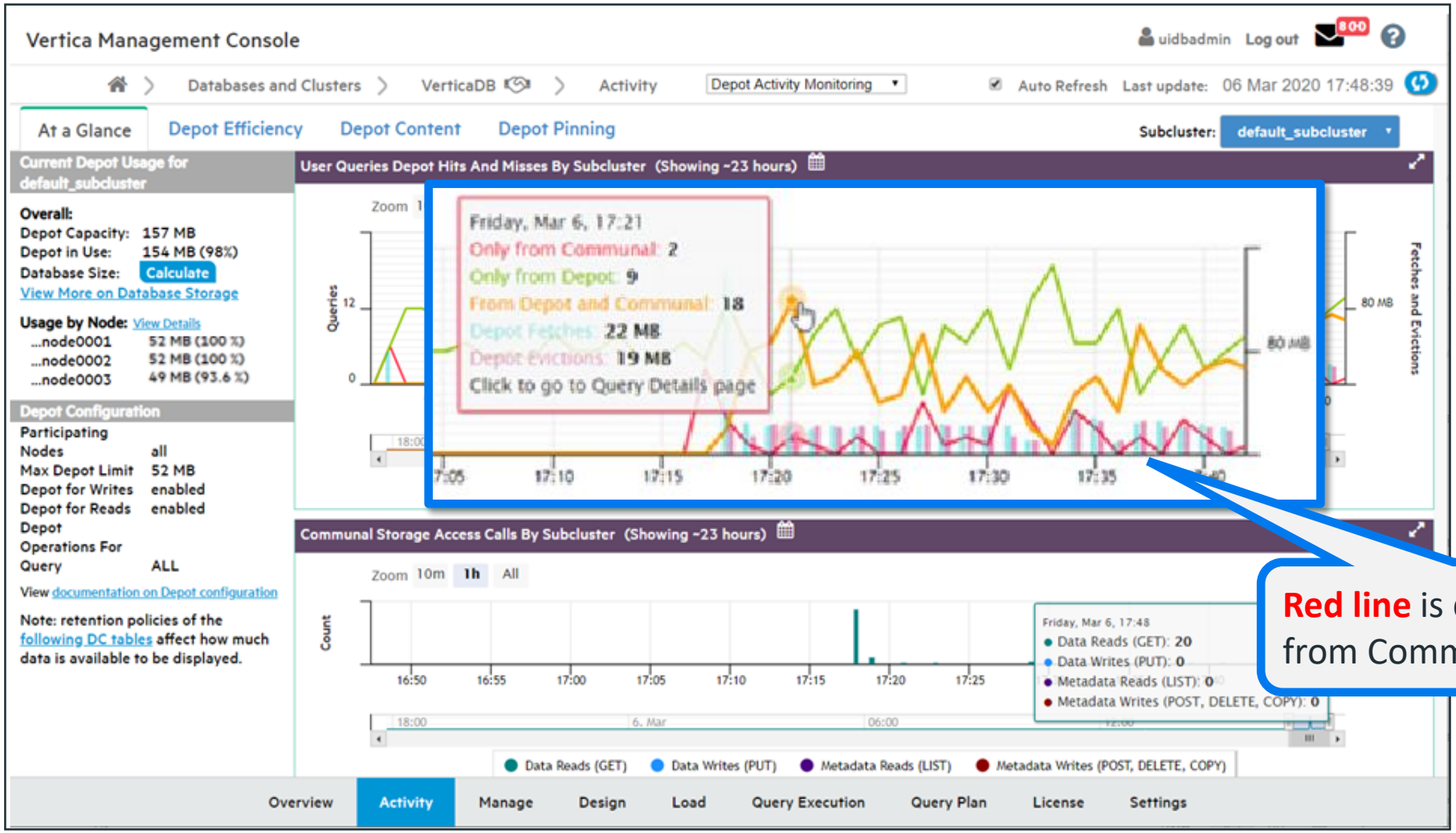
At a Glance: Adding a new workload



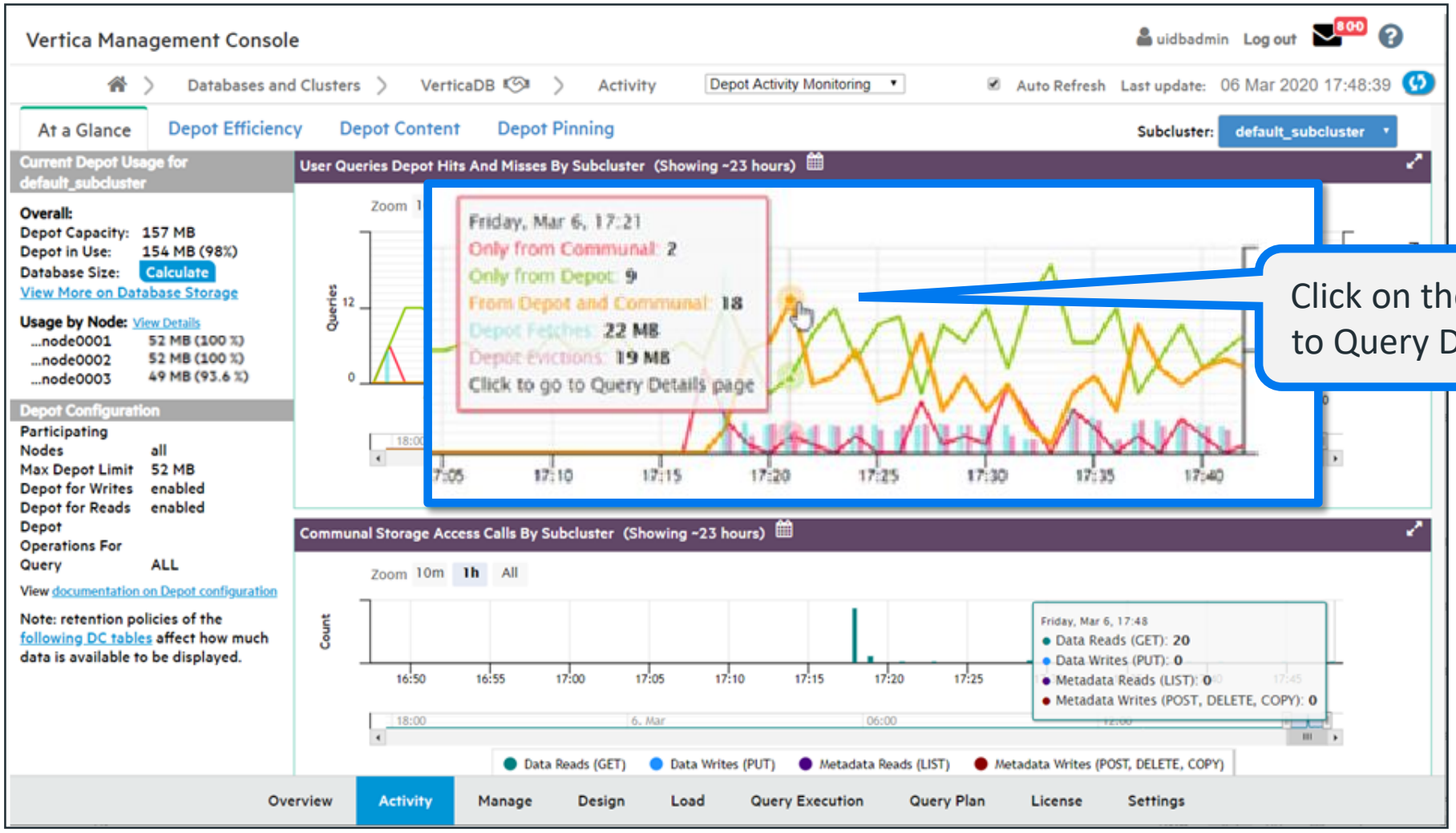
Orange line is an indicator of a query running partially in Depot and partially getting fetched from Communal

At a Glance: Adding a new workload

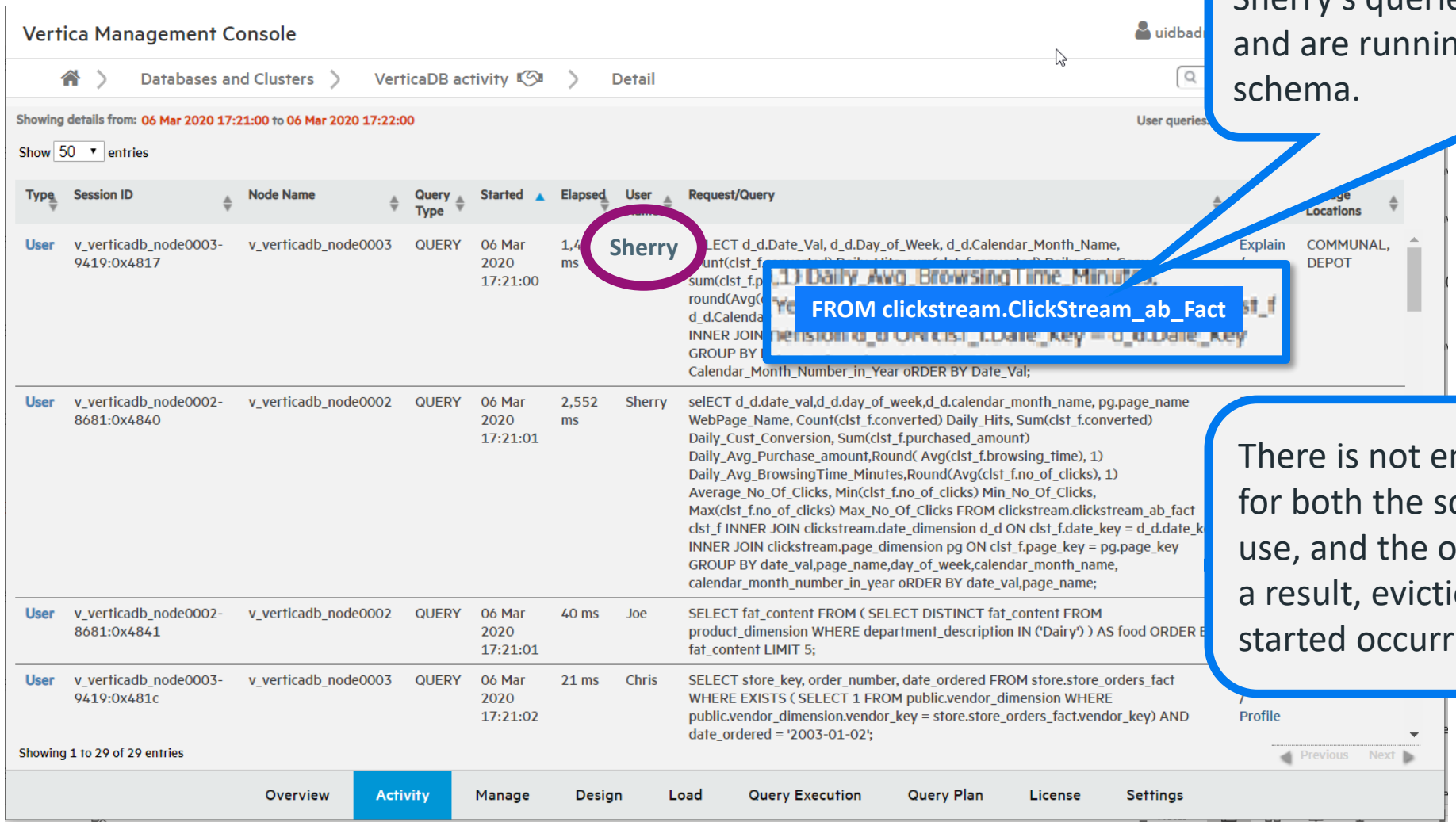


Red line is data fetched from Communal storage

At a Glance: Adding a new workload



Activity Detail: Adding a new workload

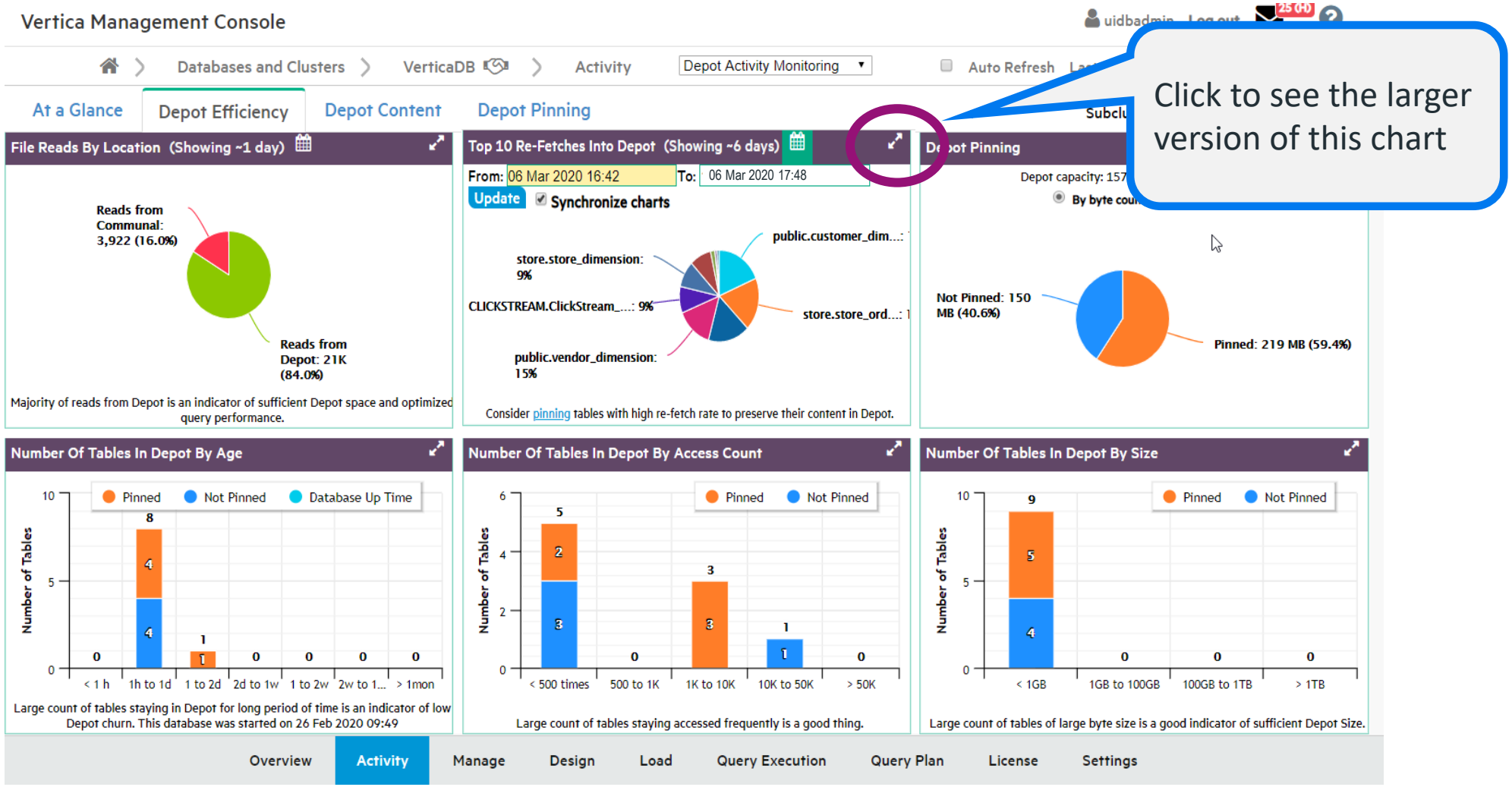


Sherry's queries involve large tables and are running against a different schema.

There is not enough Depot space for both the schema already in use, and the one Sherry needs. As a result, evictions and fetches have started occurring.

Depot Efficiency: What tables are most frequently re-fetched into Depot?

Top 10 Re-Fetches into Depot



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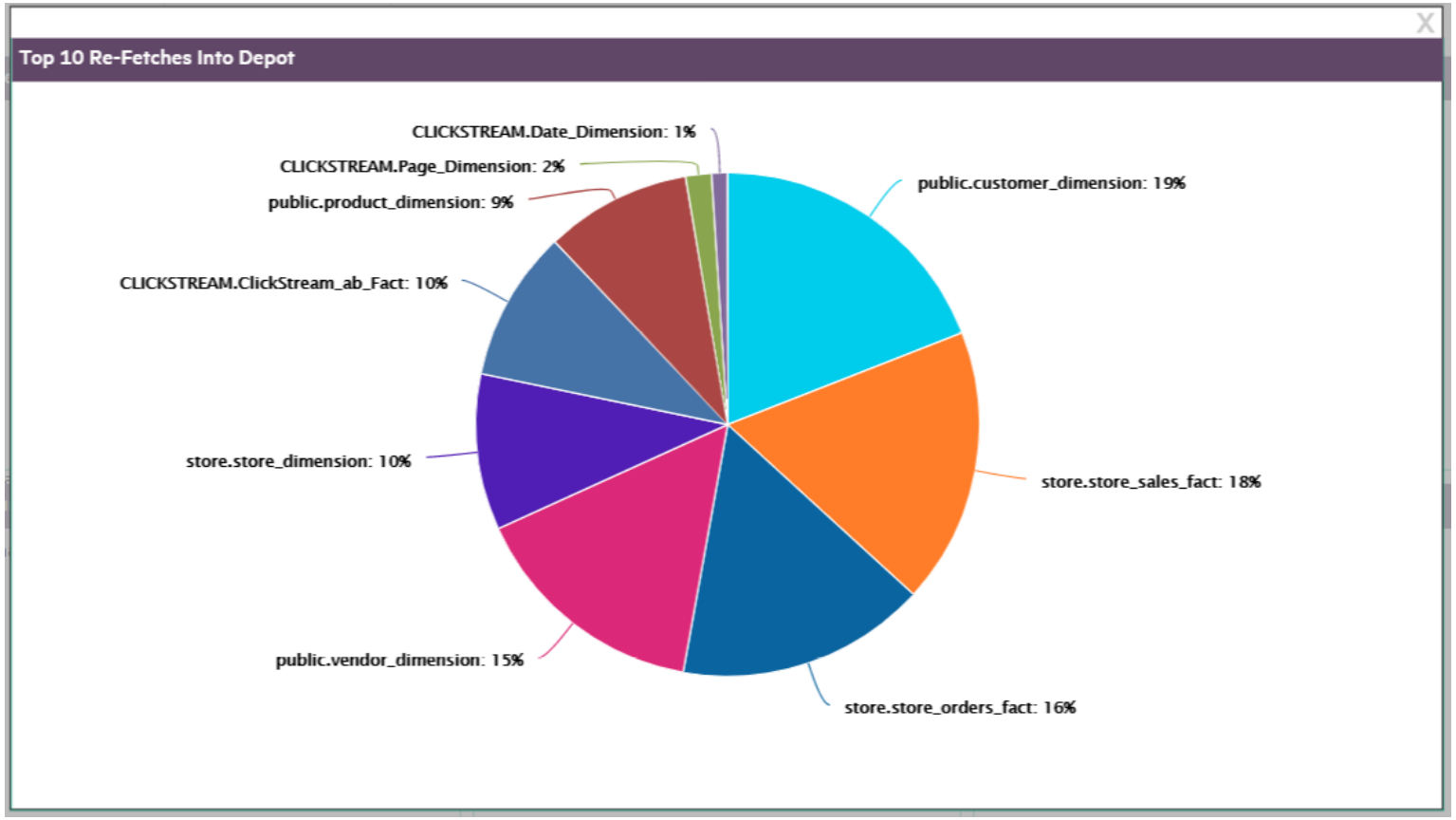


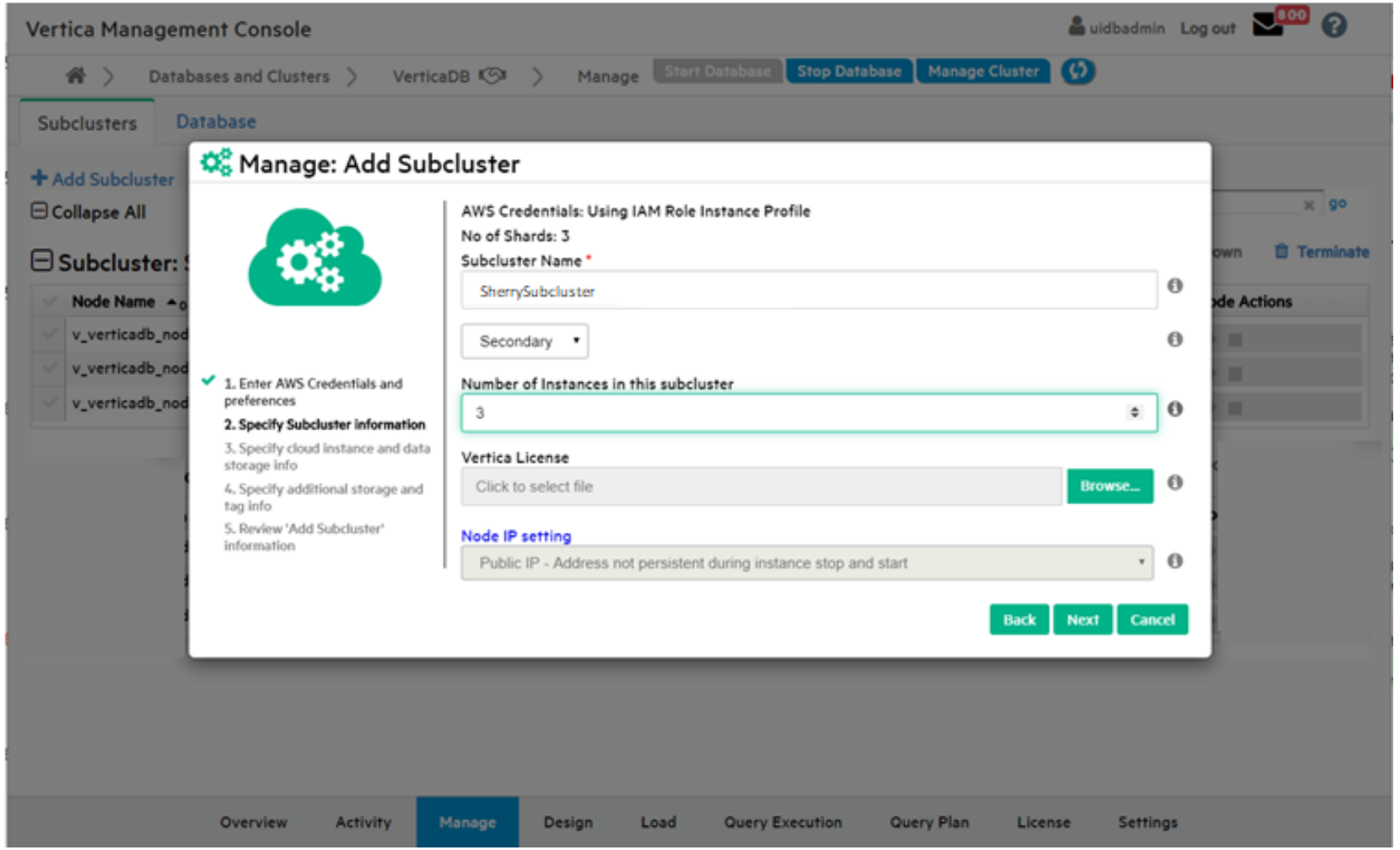
What can be done to enable all queries to run in Depot?

Option 1: Increase the Depot size

```
SELECT ALTER_LOCATION_SIZE('/vertica/depot/VerticaDB/v_verticadb_node0001_depot', 'v_verticadb_node0001', ’10G');
SELECT ALTER_LOCATION_SIZE('/vertica/depot/VerticaDB/v_verticadb_node0002_depot', 'v_verticadb_node0002', ‘10G');
SELECT ALTER_LOCATION_SIZE('/vertica/depot/VerticaDB/v_verticadb_node0003_depot', 'v_verticadb_node0003', '10G');
```

What can be done to enable all queries to run in Depot?

Option 2: Provision a second subcluster to isolate workloads like Sherry's



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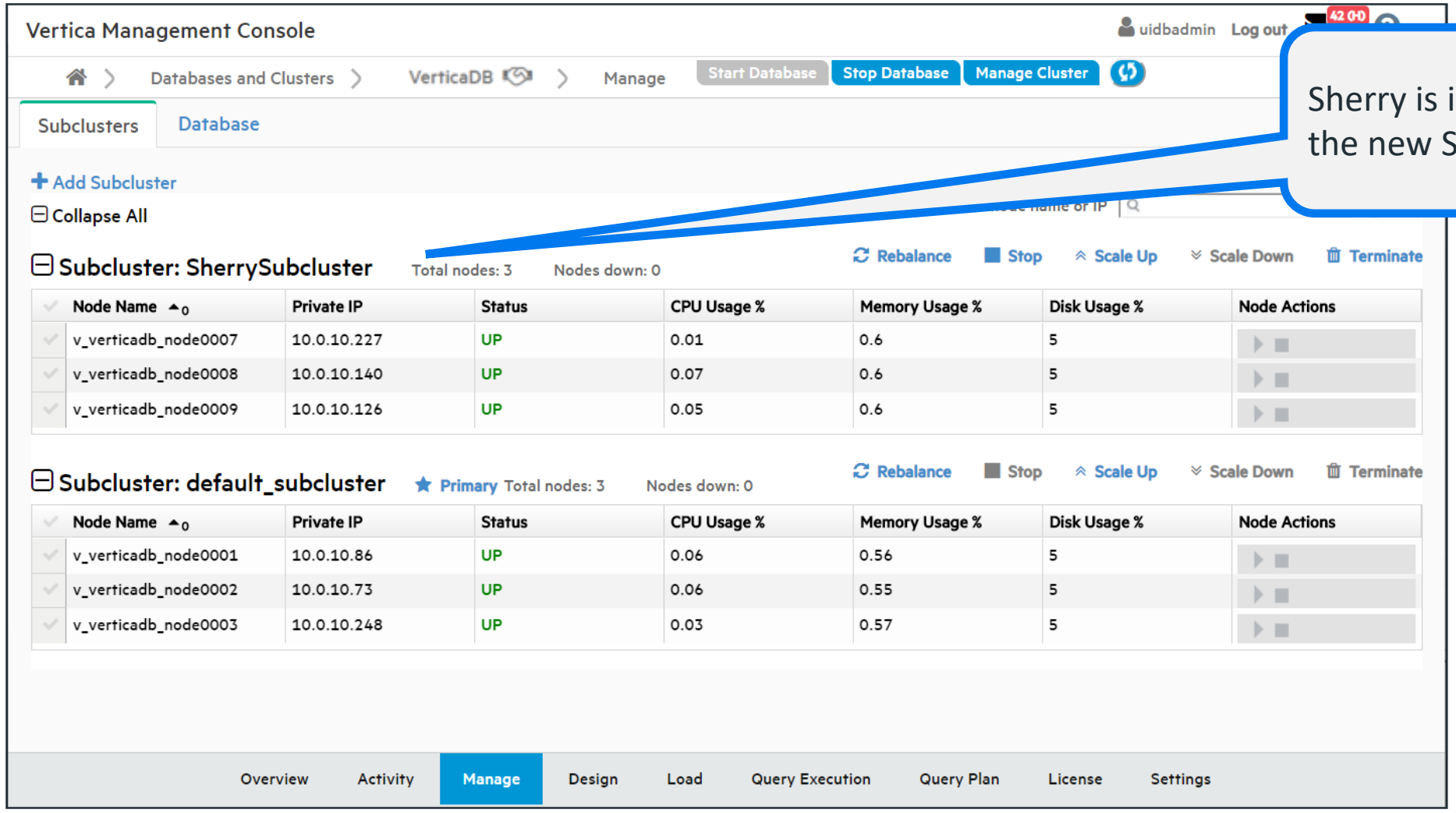
Management Tab: Second subcluster is ready to use



Sherry is instructed to use the new SherrySubcluster

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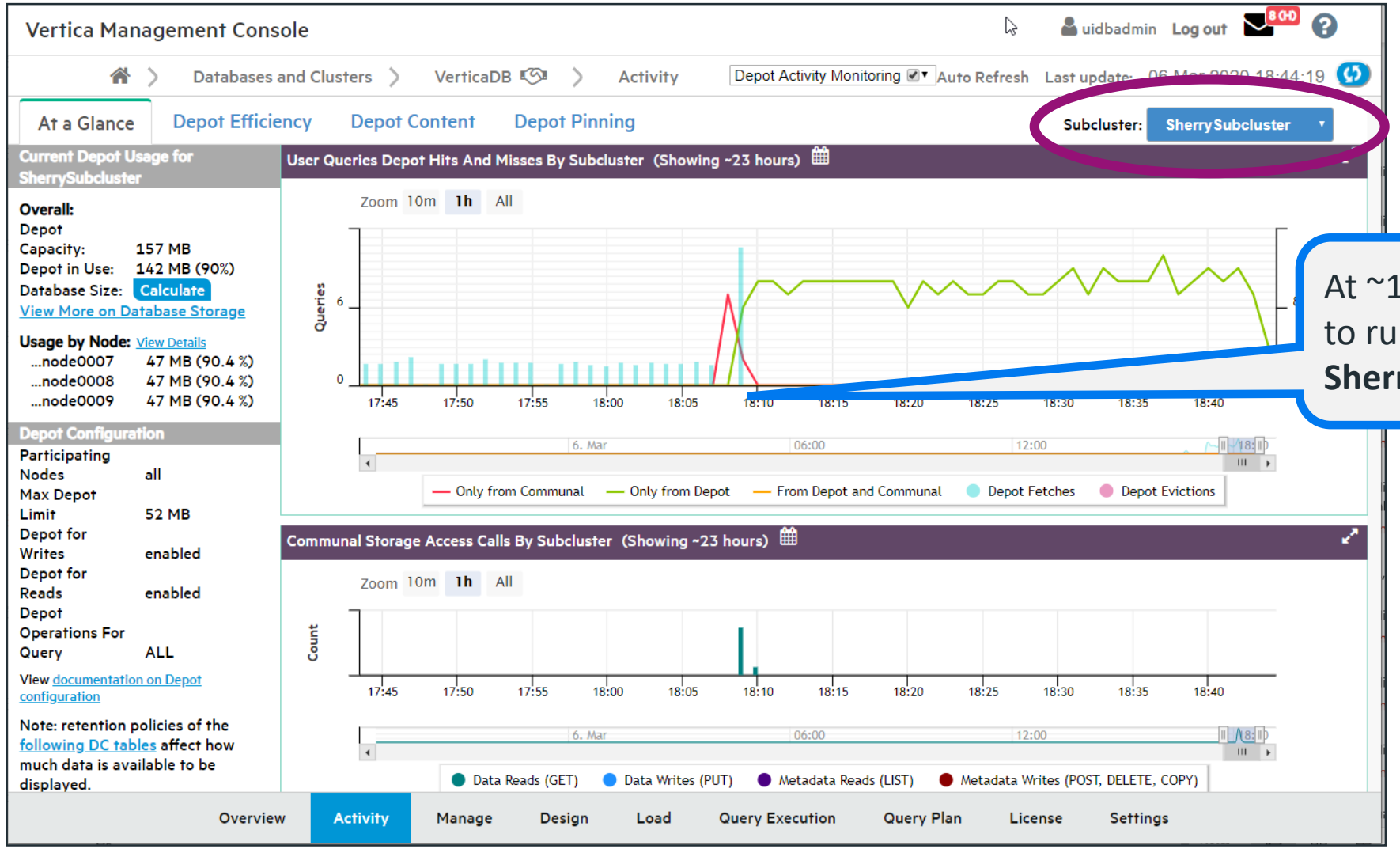
Activity Tab: Check Depot usage on new Sherry subcluster



At ~18:07, Sherry switched to running her queries on **SherrySubcluster**

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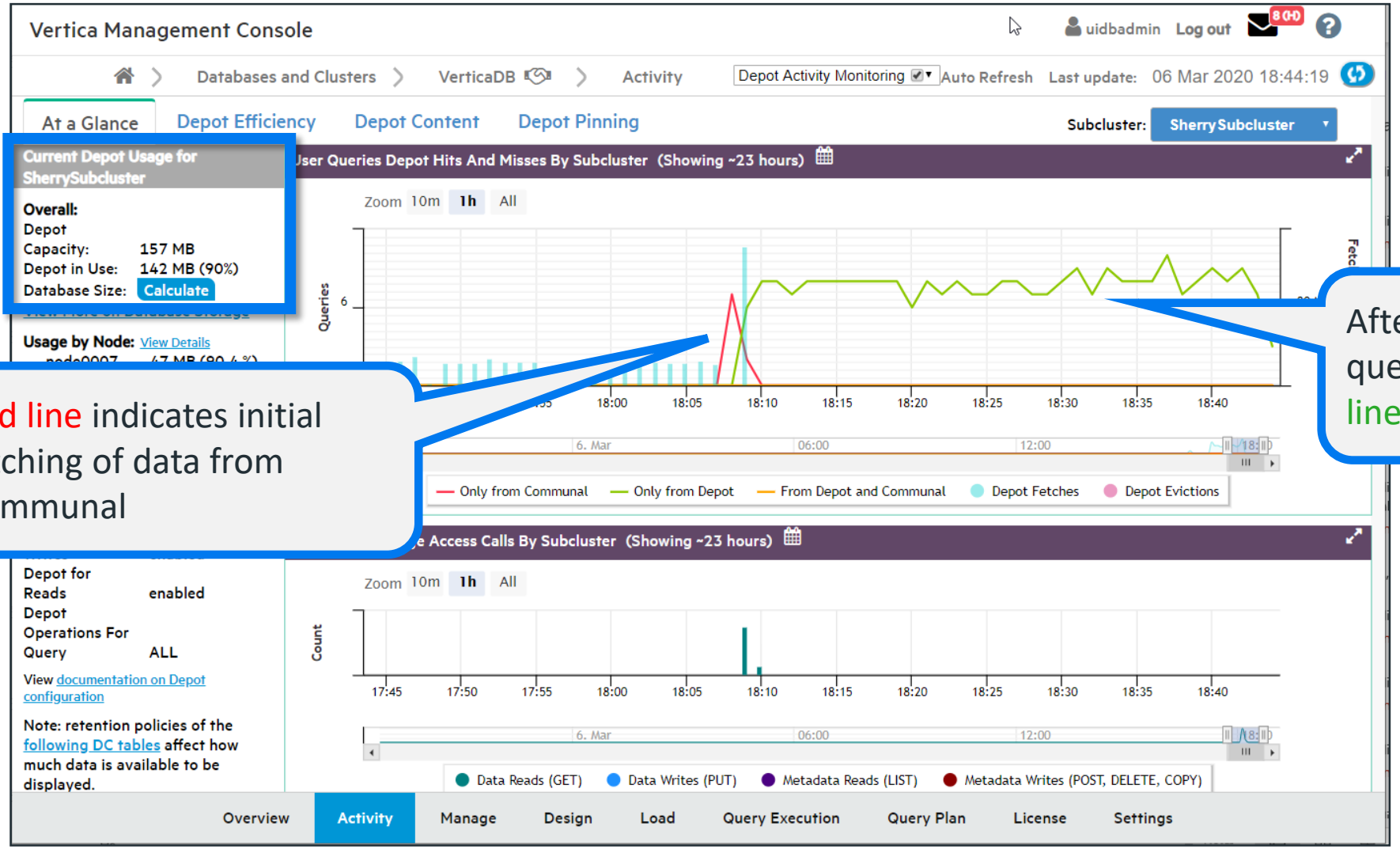

Red line indicates initial fetching of data from Communal

After that, all Sherry's queries fit in Depot - green line

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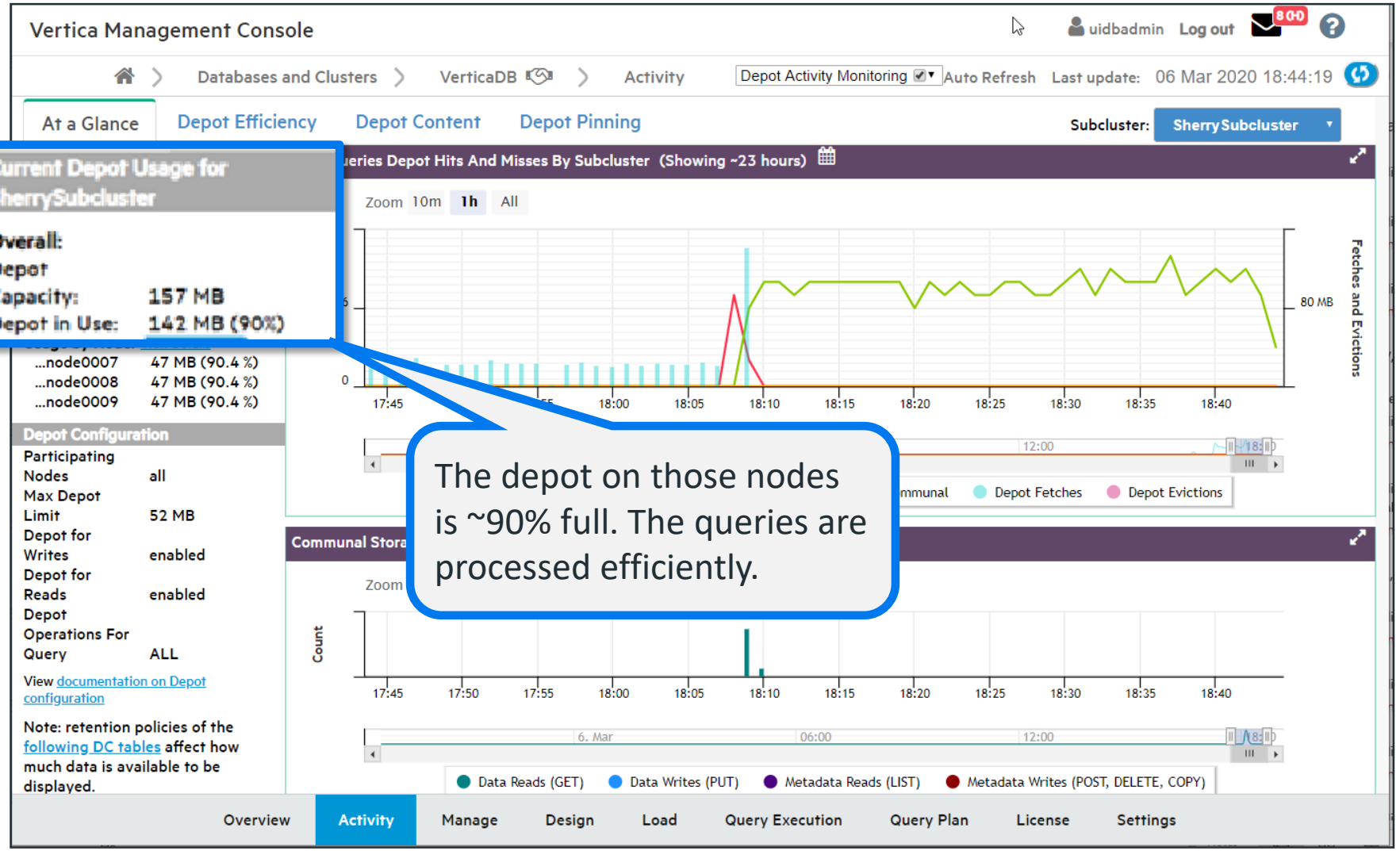
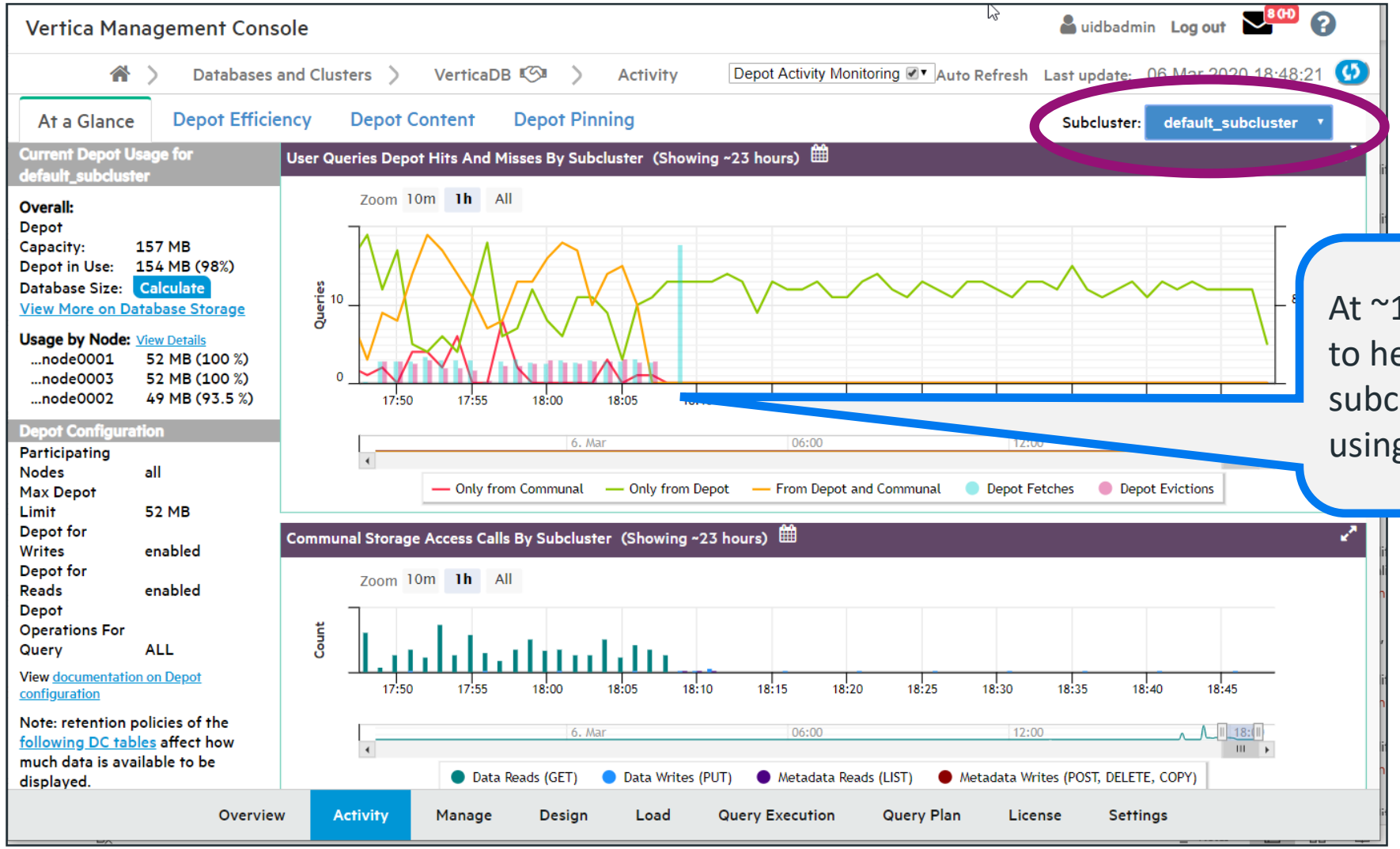
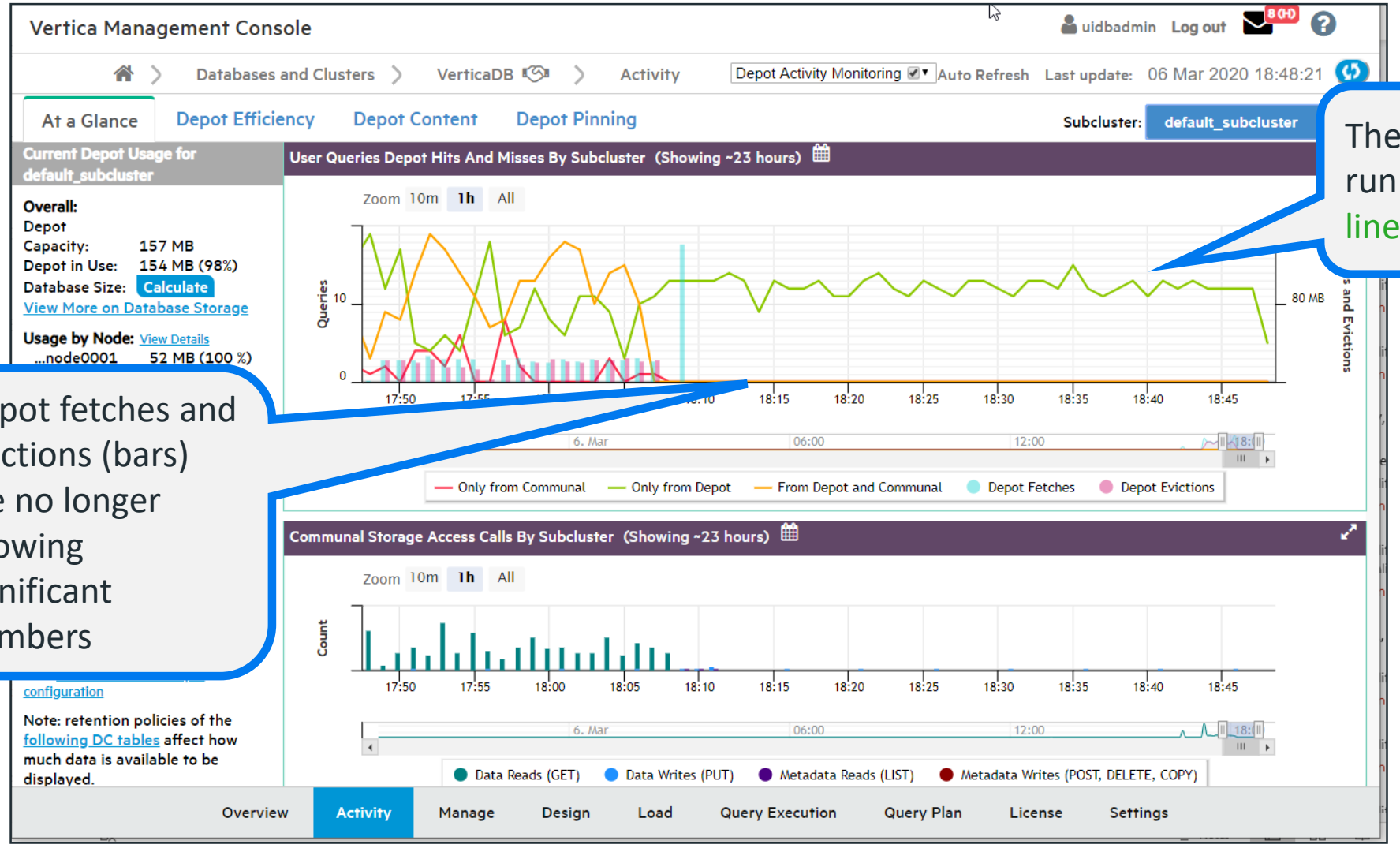


Activity Tab: Check Depot usage on default subcluster



At ~18:07, Sherry switched to her designated subcluster, and is no longer using default_subcluster

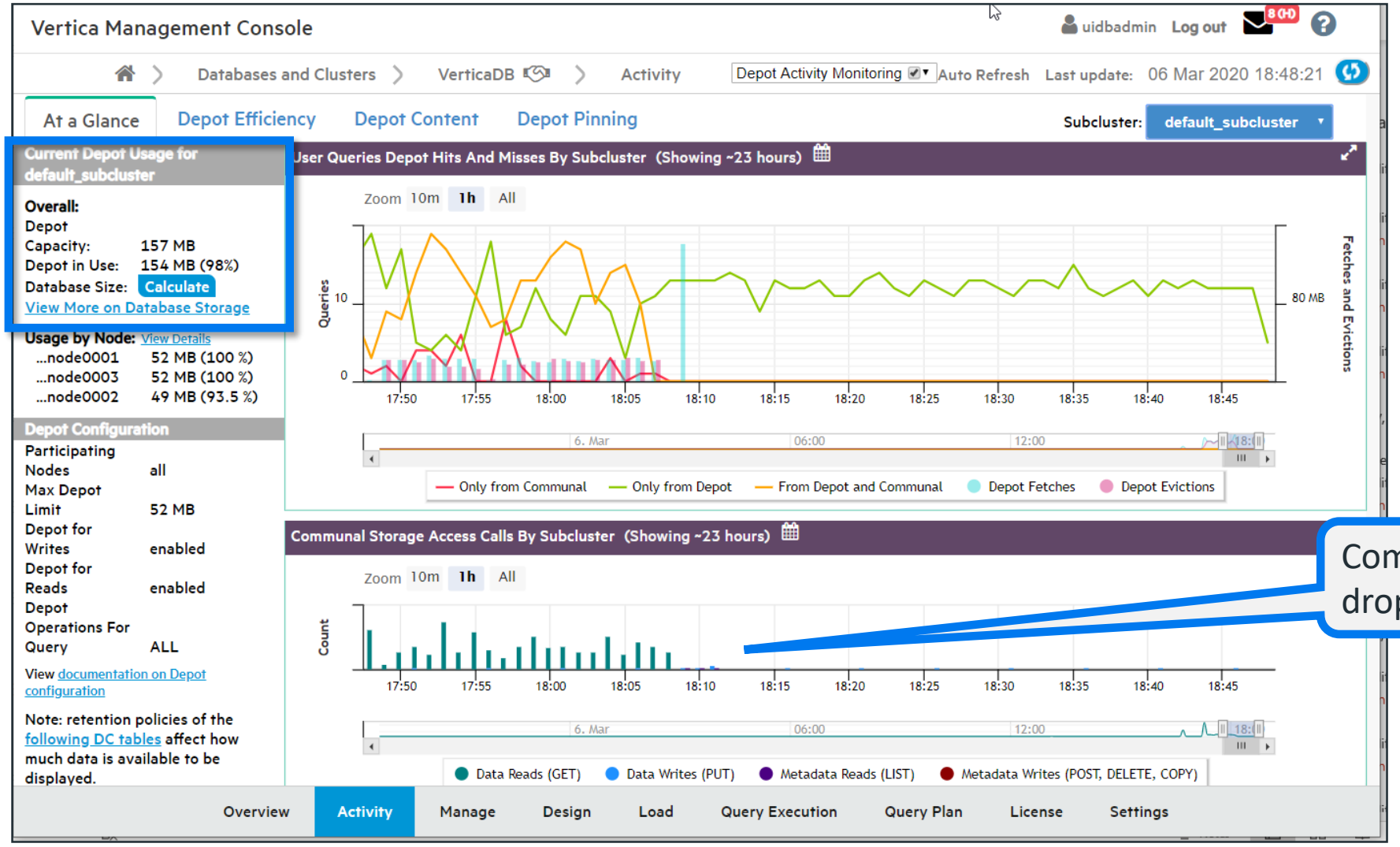
Activity Tab: Check Depot usage on default subcluster



The queries are back to running in Depot - green line

Depot fetches and evictions (bars) are no longer showing significant numbers

Activity Tab: Check Depot usage on default subcluster



Communal Storage Access dropped significantly

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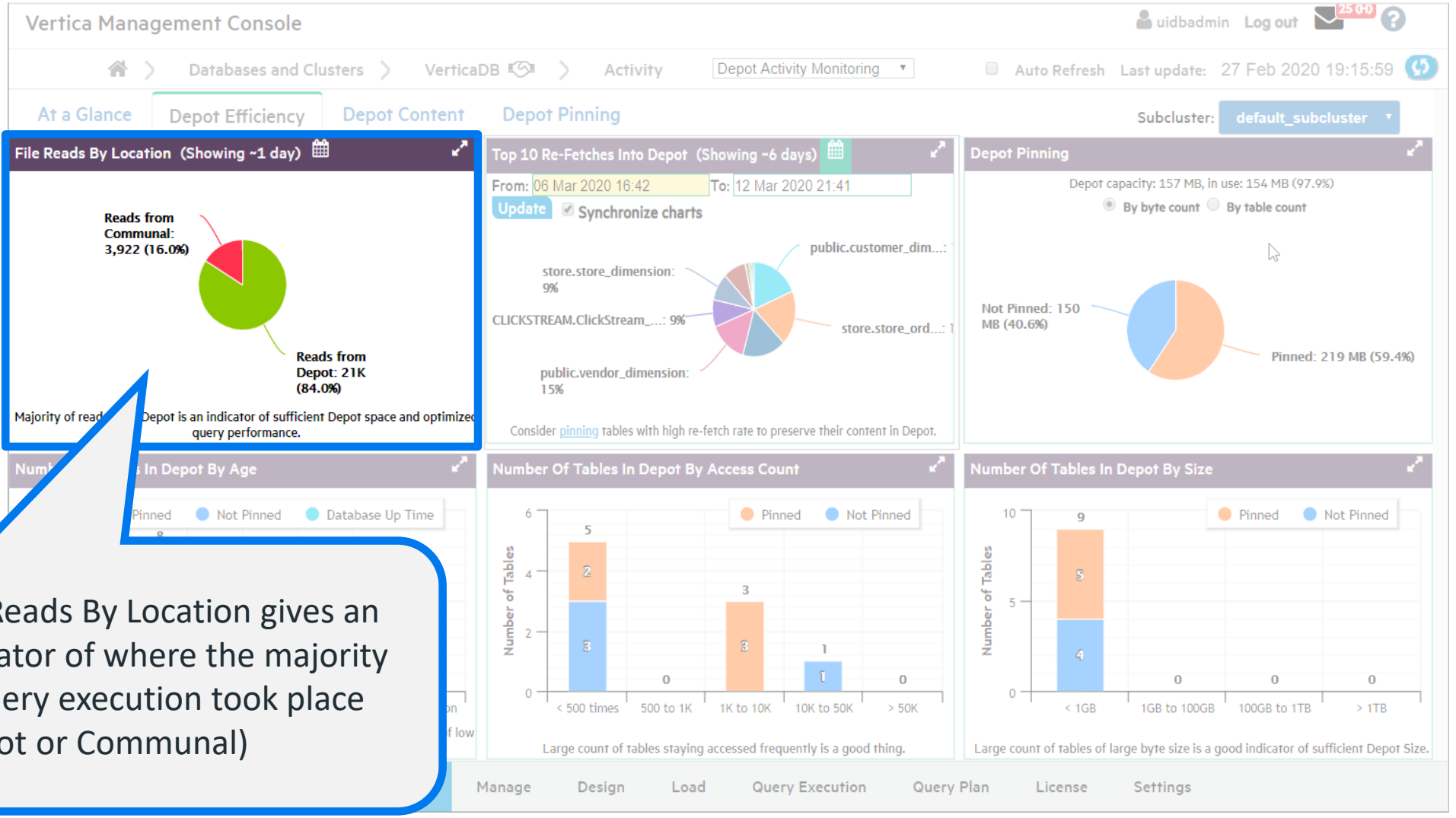
Depot Monitoring – Depot Efficiency Dashboard



File Reads By Location gives an indicator of where the majority of query execution took place (Depot or Communal)

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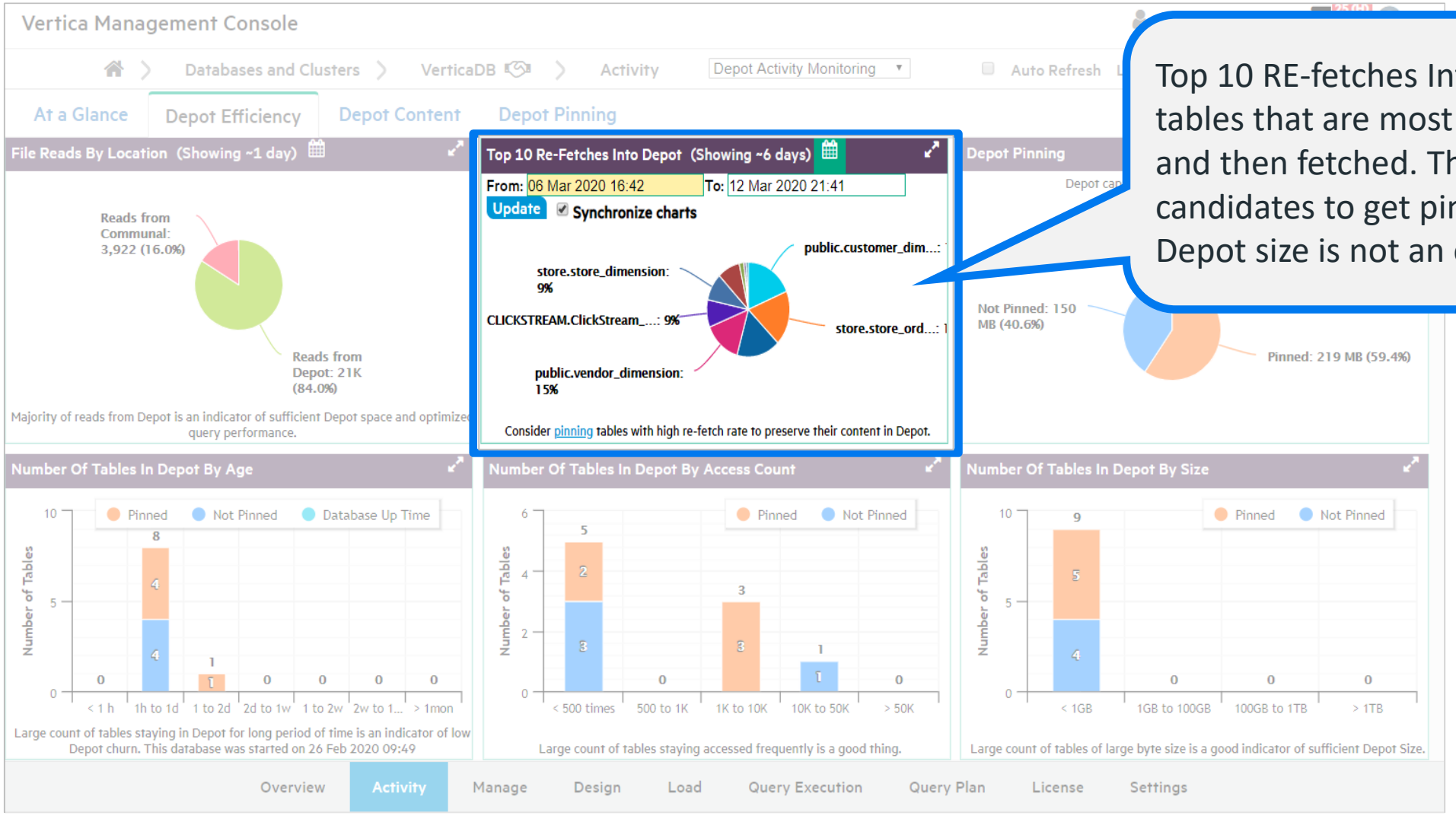
Depot Monitoring – Depot Efficiency Dashboard



Top 10 RE-fetches Into Depot show tables that are most frequently evicted and then fetched. These are good candidates to get pinned if increasing Depot size is not an option.

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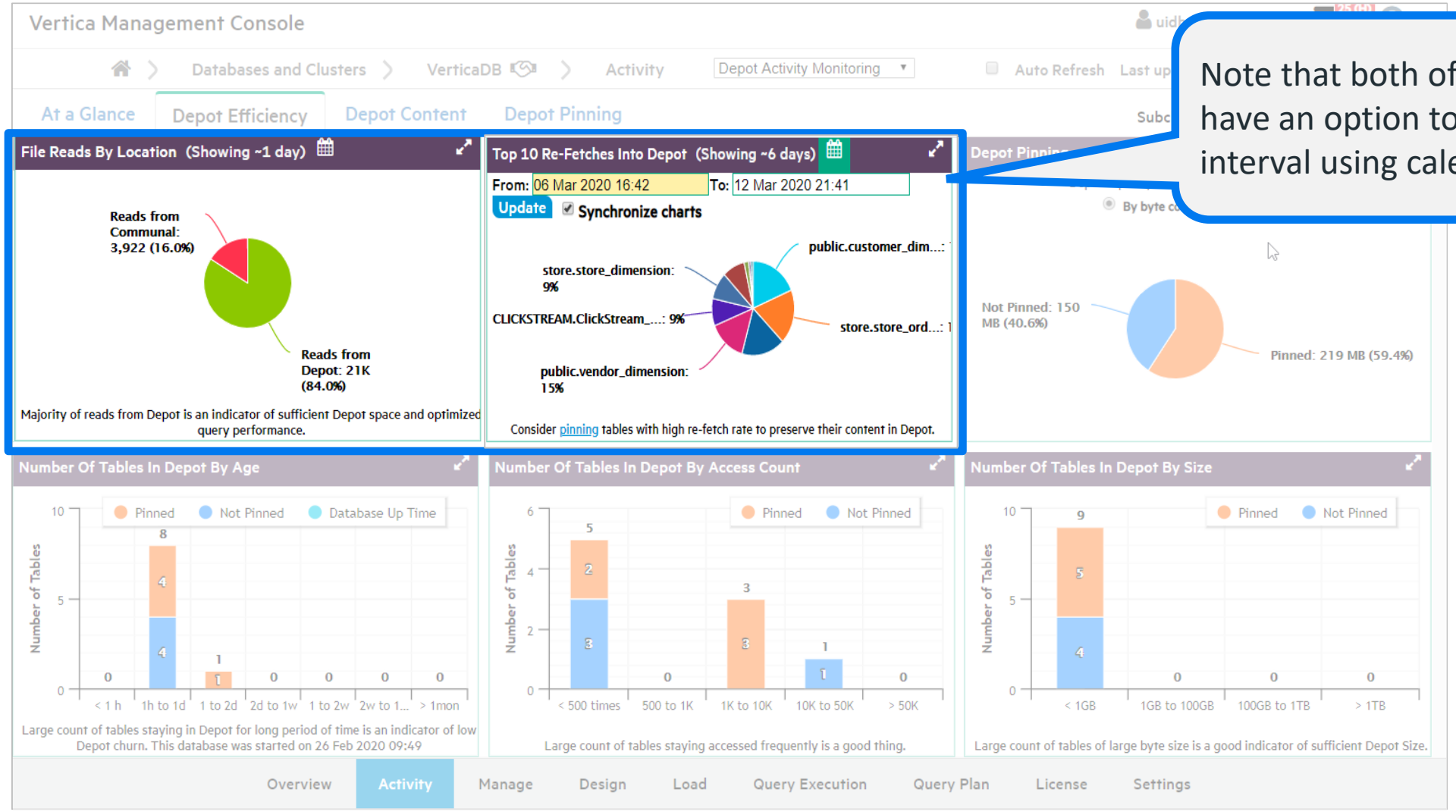
Depot Monitoring – Depot Efficiency Dashboard



Note that both of these charts have an option to select time interval using calendar widget

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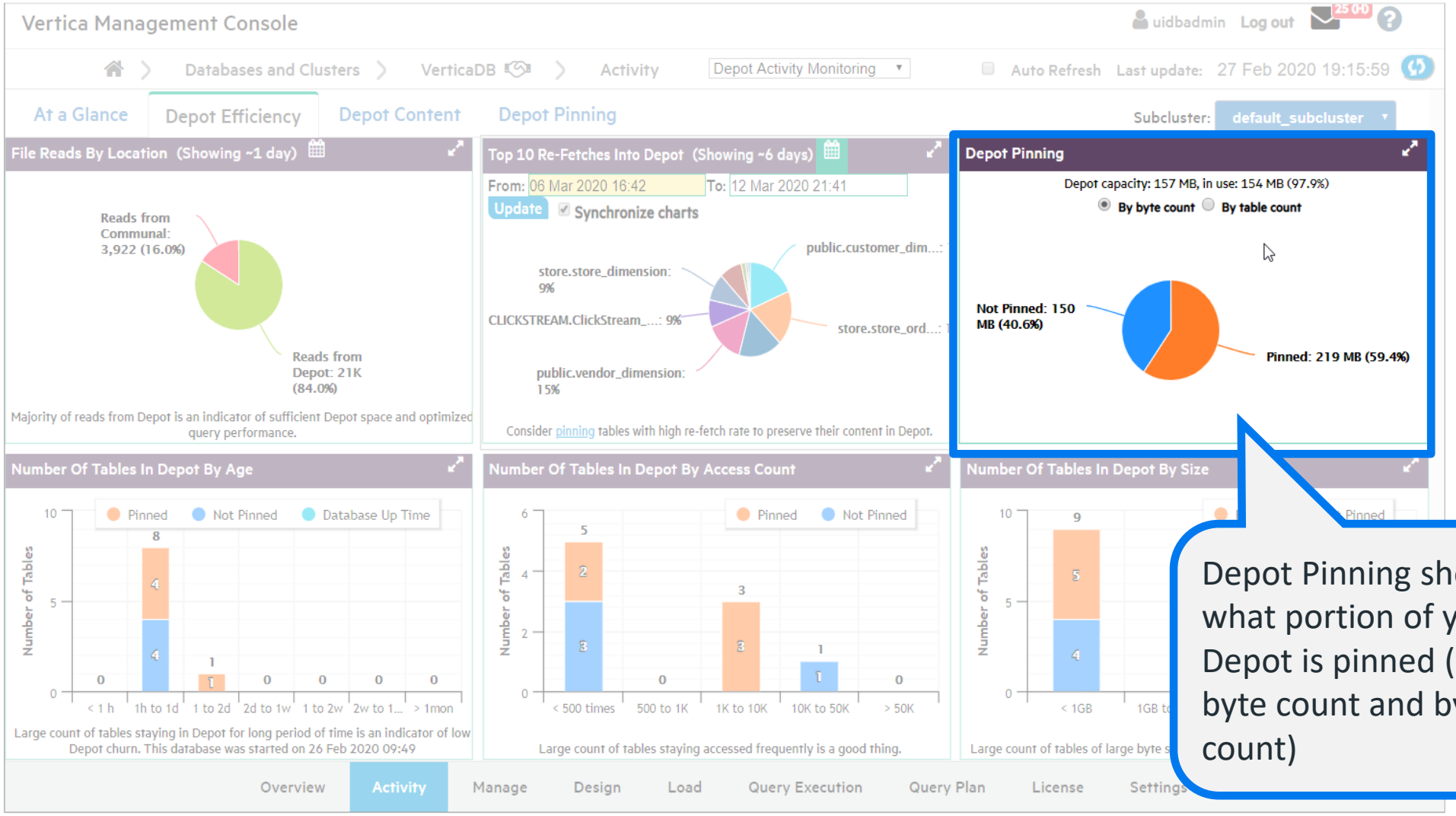
Depot Monitoring – Depot Efficiency Dashboard



Depot Pinning shows what portion of your Depot is pinned (by byte count and by table count)

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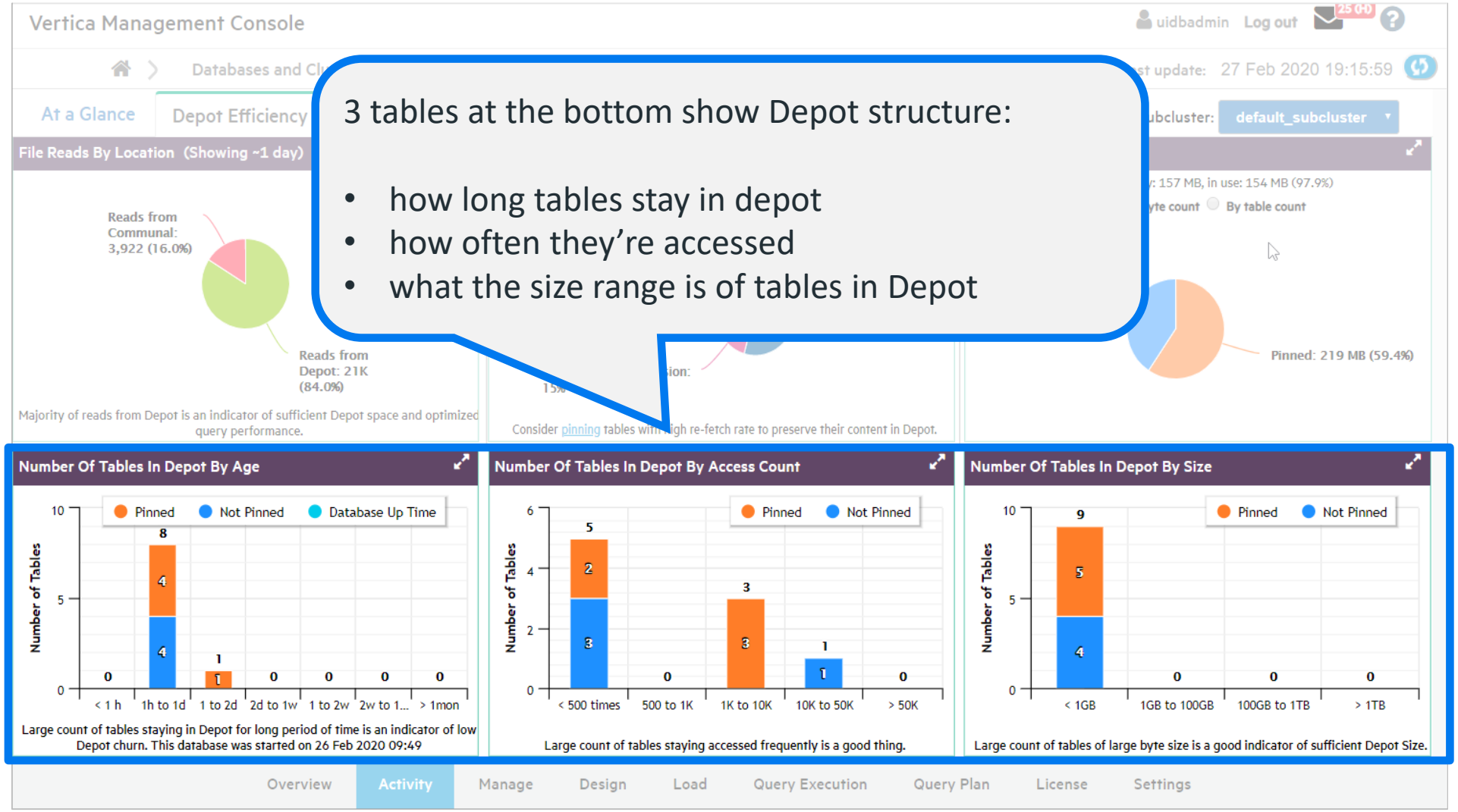
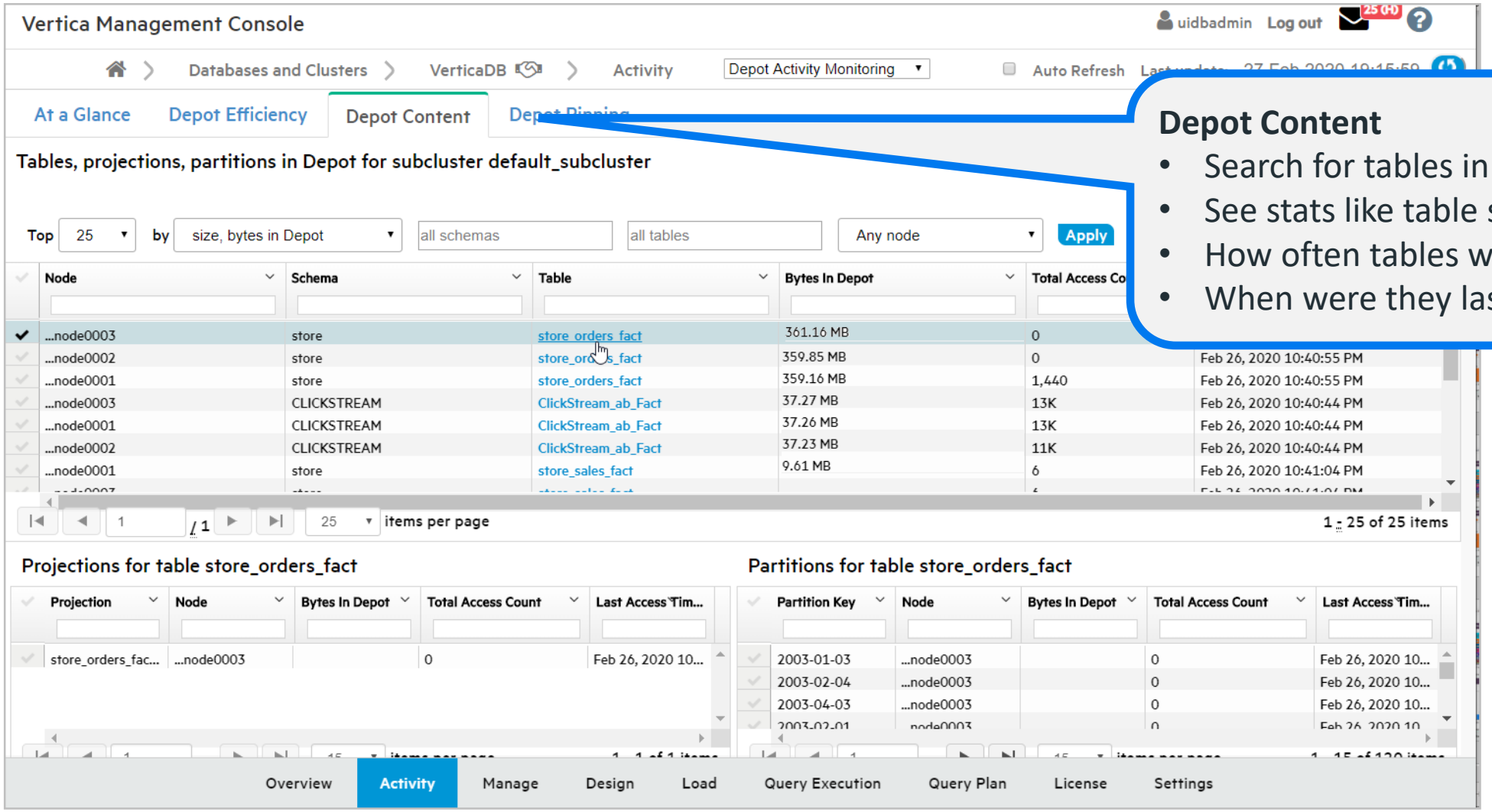
Depot Monitoring – Depot Efficiency Dashboard



Depot Content – View content of your Depot



Depot Content

- Search for tables in Depot
- See stats like table size
- How often tables were accessed
- When were they last accessed

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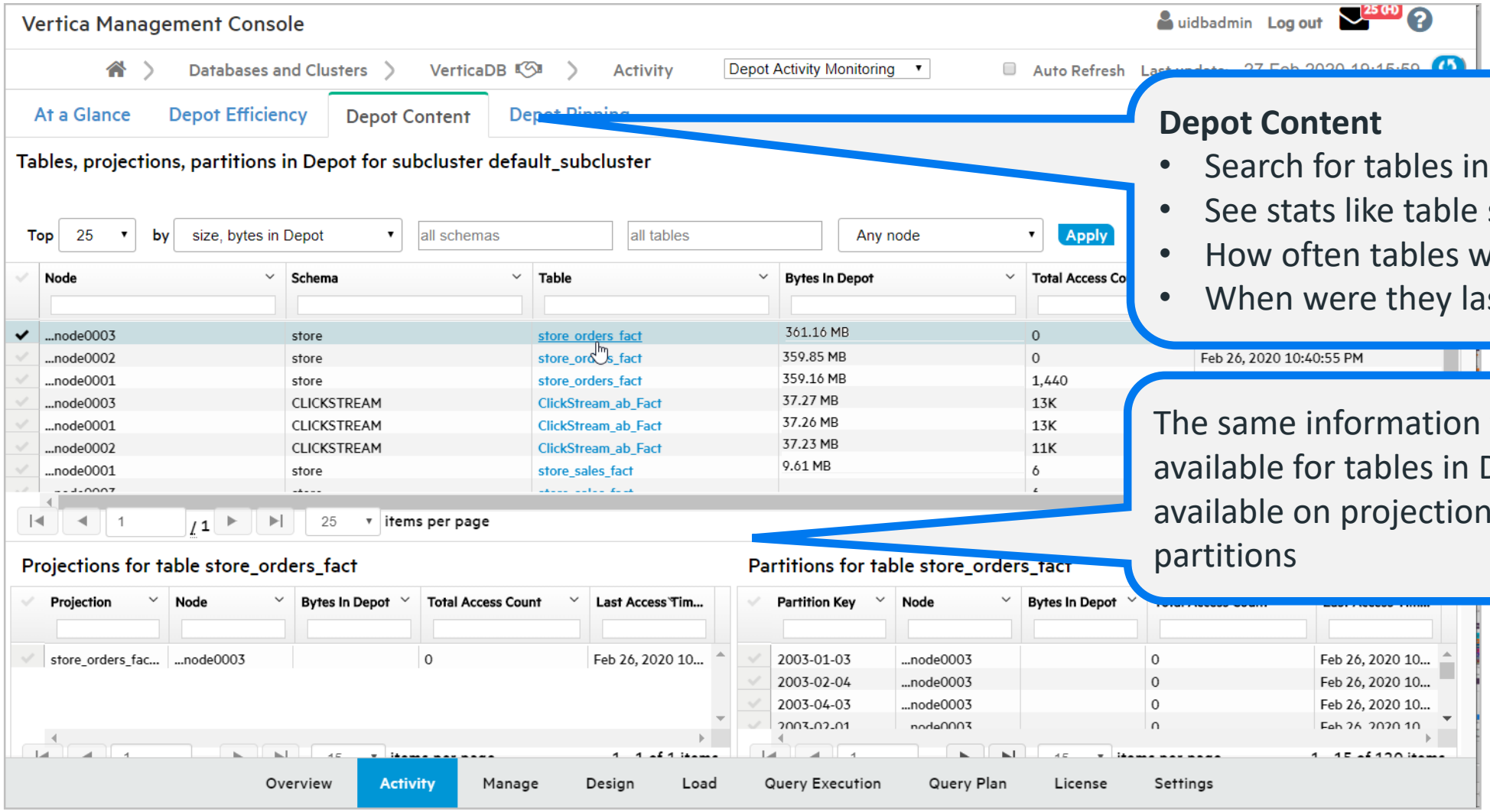
Depot Content – View content of your Depot

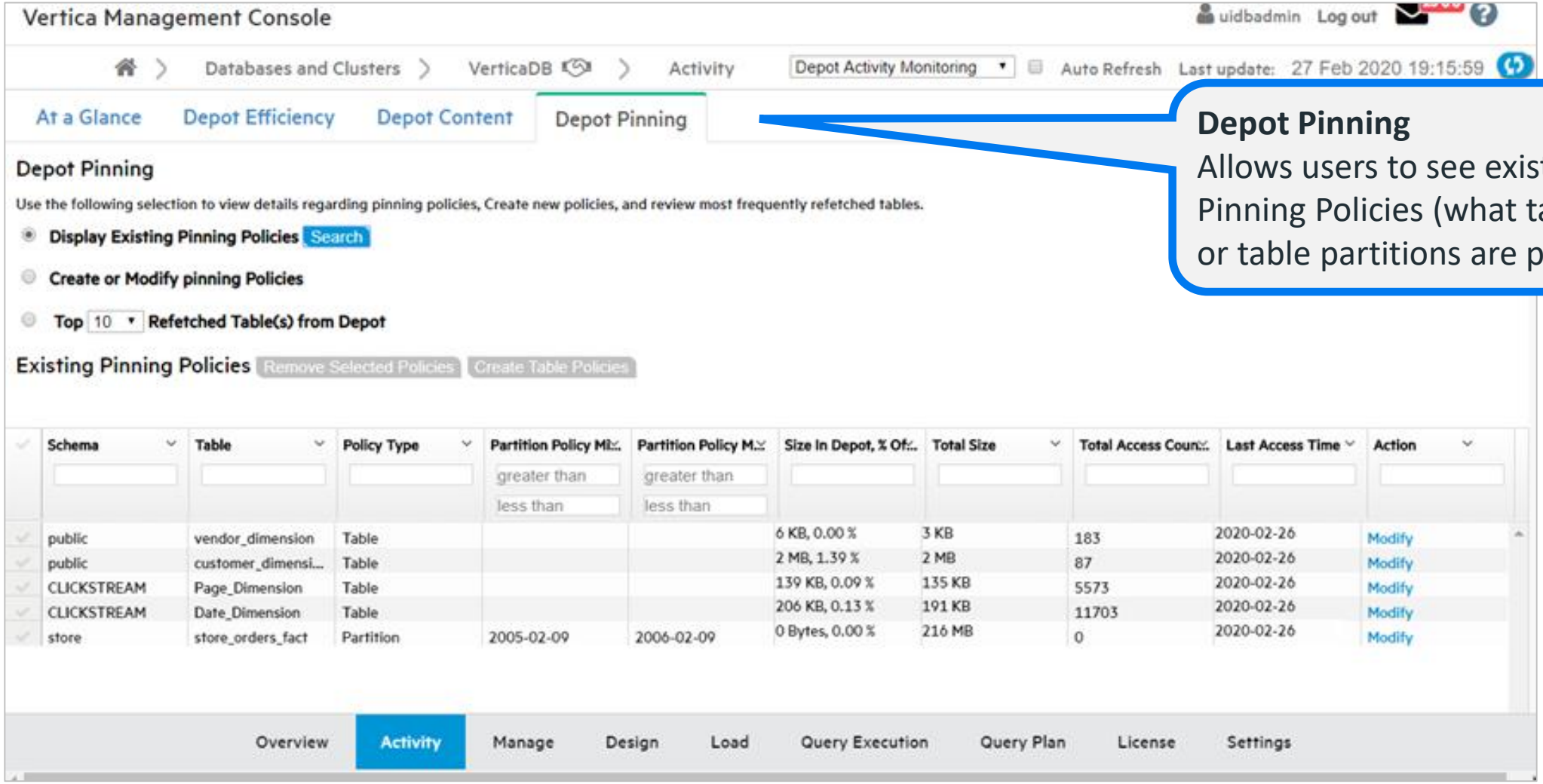


Depot Content

- Search for tables in Depot
- See stats like table size in Depot
- How often tables were accessed
- When were they last accessed

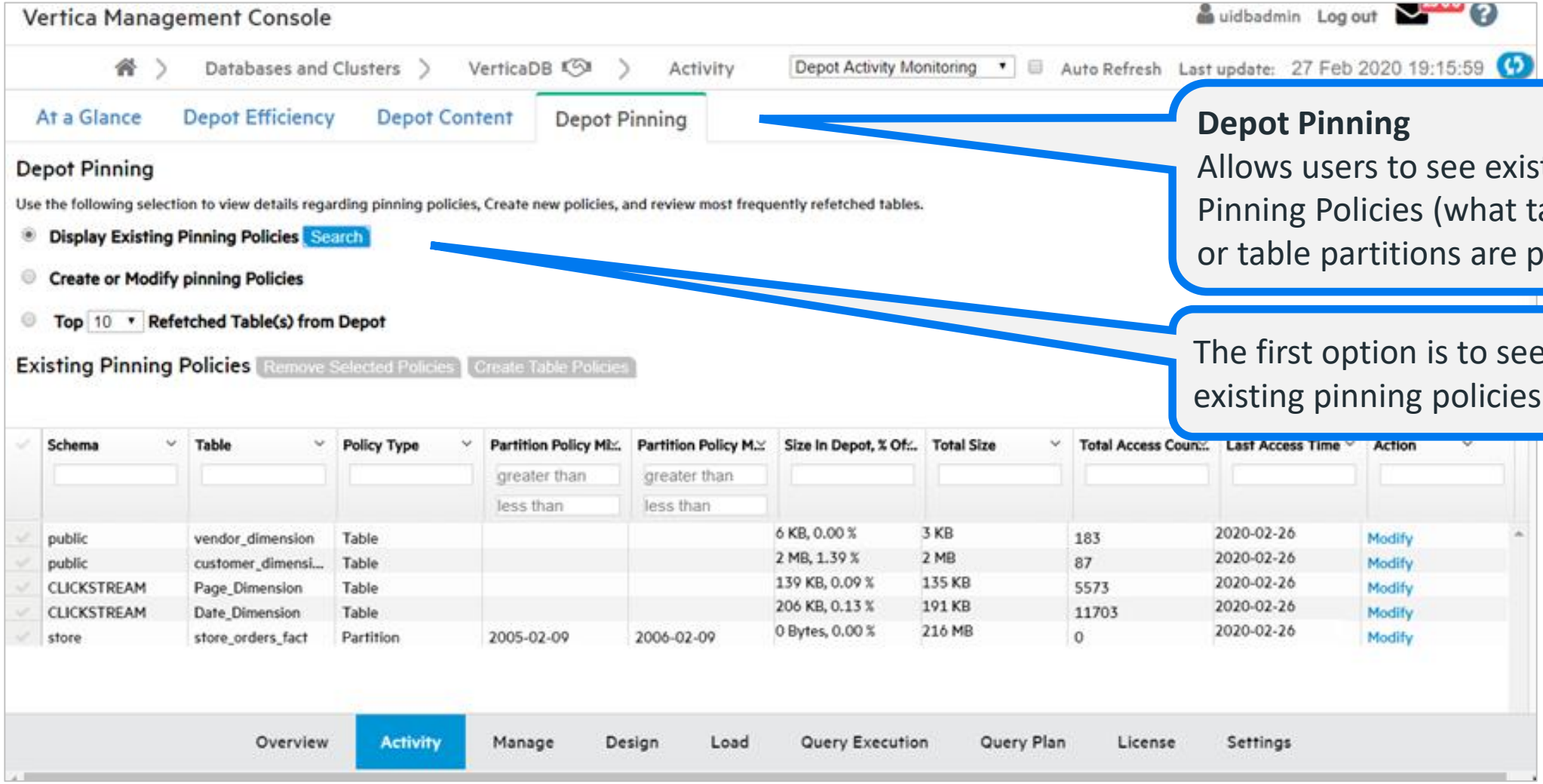
The same information that is available for tables in Depot is also available on projections and partitions

Depot Pinning



Depot Pinning
Allows users to see existing Pinning Policies (what tables or table partitions are pinned)

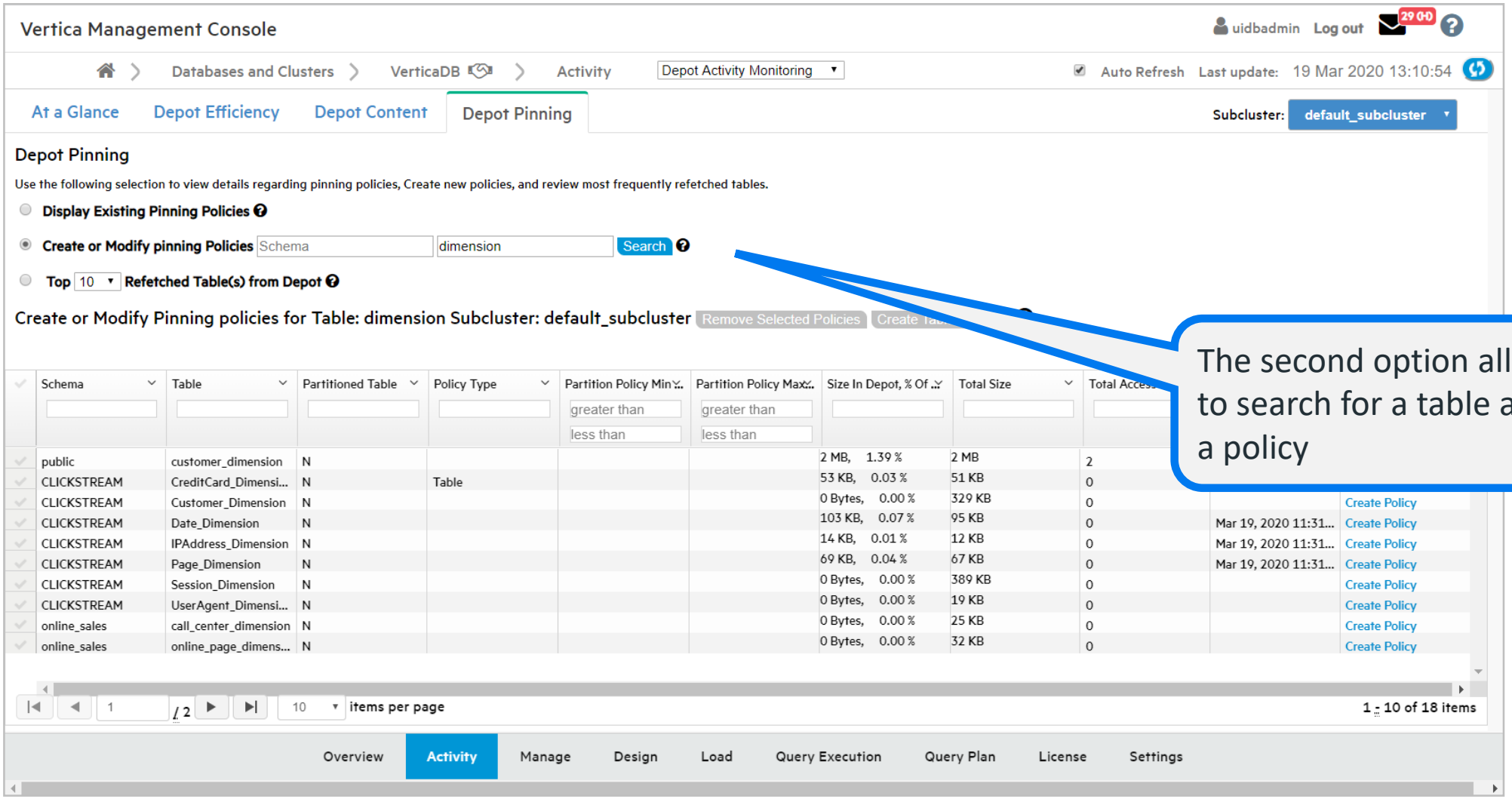
Depot Pinning



Depot Pinning
Allows users to see existing Pinning Policies (what tables or table partitions are pinned)

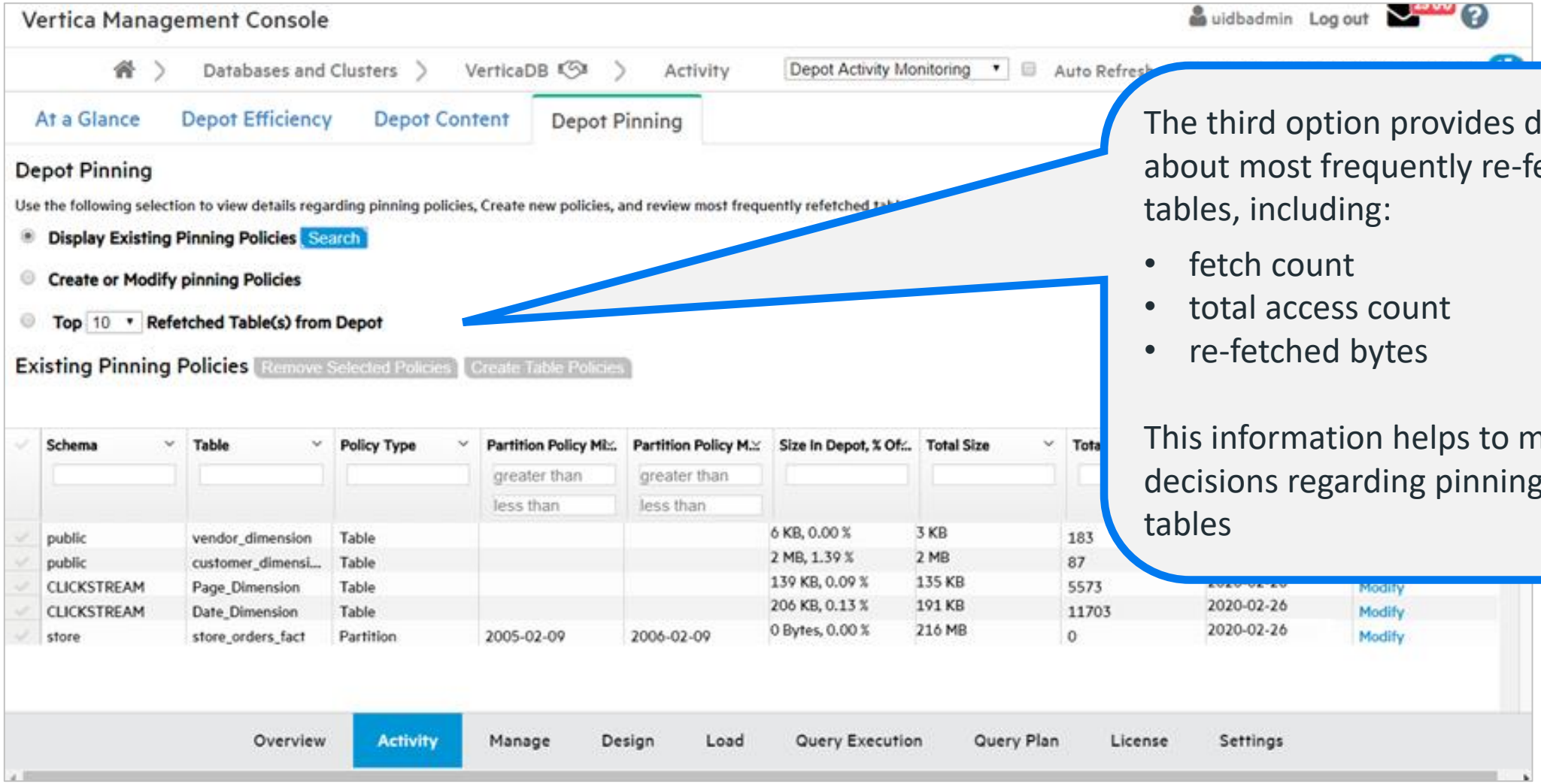
The first option is to see existing pinning policies

Depot Pinning



The second option allows you to search for a table and create a policy

Depot Pinning



The third option provides details about most frequently re-fetched tables, including:

- fetch count
- total access count
- re-fetched bytes

This information helps to make decisions regarding pinning specific tables

Management Console Roadmap

Management Console Roadmap

- Subcluster management
  - Promoting/demoting subclusters
  - Load balancing across subclusters
  - Scheduling subcluster actions
  - Support for large cluster mode
- WLA enhanced recommendations
- Backup and restore from MC
- Building custom thresholds
- Eon on HDFS support

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