



Turbonomic 8.2.0 Release Notes

May 19, 2021

This document describes issues that are addressed in Turbonomic 8.2.0 – Release Date: May 19, 2021. Please see the Turbonomic 8 documentation for earlier versions of the Release Notes:

<https://docs.turbonomic.com/>

NOTE:

These release notes are for update to Turbonomic 8.2.0, from version 7.22.0 or later. For updates from the 7.21.x family or earlier, please contact your Technical Support representative.

For any questions, please contact Turbonomic Technical Support at support@turbonomic.com, or open a ticket at:

<https://support-turbonomic.force.com/TurbonomicCustomerCommunity/s/customer-support>

What's New for Version 8.2.0

Version 8.2.0

- **Container Resource Management**

- **Optimize Container Cluster Plan**

This release introduces a new plan type called Optimize Container Cluster. Run this plan to identify performance and efficiency opportunities for a single Kubernetes cluster. The results show the optimal number of nodes you need to assure performance for your existing workloads, and the impact of actions on the health of your container workloads and infrastructure.

For details, see "Optimize Container Cluster Plan" in the *User Guide*.

- **Labels and Annotations for Container Entities**

Turbonomic now discovers Workload Controller labels and annotations as tag properties, and then applies the same properties to the associated Container Specs. You can filter these entities by labels or annotations when you use Search or create groups for your container policies.

- **Enhancements for Kubernetes Environments**
 - When recommending *Move* actions for a pod, Turbonomic now considers the memory/storage eviction thresholds of the destination node to ensure that the pod can be scheduled after it moves. Eviction thresholds for `imagefs` and `rootfs` are reflected as node effective capacity in the market analysis.
 - This release introduces the **Number of Replicas** chart. Use the chart to see adjustments to the Application Component replicas over a given time period. For example, if Kubernetes Horizontal Pod Autoscaler (HPA) is enabled for a Service, Turbonomic tracks adjustments to the number of replicas made by HPA.
- **Cloud Resource Management**
 - **Improved Cloud Analytics**

We have improved our cloud analytics to increase the accuracy of our recommendations and deliver better results. As you continue to execute the actions that we recommend for your cloud environment, you can expect to see increased RI coverage and additional savings.

You can see immediate improvements if you have VMs covered by Azure Hybrid Benefit. When calculating costs for these VMs, Turbonomic now considers workload licensing rates offered through the benefit. This allows Turbonomic to calculate costs more accurately and recommend correct scaling actions for the VMs.
 - **Azure VM Throughput Scaling**

Turbonomic can now recommend scaling uncached IO throughput capacity for Azure VMs. It uses percentile calculations to analyze throughput utilization more accurately and then picks the most suitable tier for scaling.
 - **Support for Azure Site Recovery and Azure Backup Volumes**

Turbonomic discovers Azure Site Recovery and Azure Backup volumes when you add Azure targets, and shows capacity and cost for each volume. Because these volumes are critical to business continuity and disaster recovery, Turbonomic will never recommend deleting them.

For details, see "Azure Site Recovery and Azure Backup Volumes" in the *User Guide*.
 - **Integration with Azure Monitor Log Analytics**

Turbonomic can now collect performance metrics for your Azure VMs via Azure Monitor Log Analytics. It discovers the Log Analytics workspaces that you have created and then retrieves data periodically. With this additional source of data, Turbonomic can analyze memory utilization for the VMs more accurately.

For details, see "Performance Metrics for Azure VMs" in the *User Guide*.
 - **Currency Settings**

By default, Turbonomic uses the dollar symbol (\$) when displaying the costs and savings that it discovers or calculates for your cloud workloads. You can now set a different symbol to match your preferred currency.

Currency symbols are for display purposes only. Turbonomic does not convert monetary values when you switch symbols.

For details, see "Currency Settings" in the *User Guide*.
 - **Chart Enhancements**

For cloud environments, the **Necessary Investments** and **Potential Savings** charts have been enhanced for ease of use. In the ring chart or legend, you can now click an action type (for example, **Scale Volumes** or **Buy RI**) to display a filtered view of the actions list. In addition, when you click **Show All**, you will first see the actions that will incur the highest costs or introduce the most savings.
- **On-prem Resource Management**
 - **Support for Oracle WebLogic and IBM WebSphere**

Turbonomic now supports Oracle WebLogic and IBM WebSphere as targets, and can recommend resizing heap and thread pool capacity. Information about the resources required to ensure the performance of these targets will also be part of sizing the underlying infrastructure.

For details, see:

- "Oracle WebLogic" in the *Target Configuration Guide*
- "IBM WebSphere" in the *Target Configuration Guide*

- **Embedded Reporting**

If you have enabled Embedded Reporting in your Turbonomic instance:

- You can now create custom reports by running SQL queries against the instance's Embedded Reporting database.
- Turbonomic now collects the following data for reports:
 - Metrics: Peak and cluster headroom values
 - Actions: Percentile values for current actions
- To manage reports, a user must have the Report Editor role. Only one user per instance is allowed to have this role (by default, the local **administrator** user). You can assign the role to another user.
- You can now configure an external TimescaleDB server as a data source for your reports.

For details, see "Embedded Reporting" in the *User Guide*.

Configuration Requirements

For this release of Turbonomic, you should satisfy the following configuration requirements.

Supported MariaDB Version

For its default historical database, Turbonomic currently supports MariaDB version 10.5.6. This support includes comprehensive testing and quality control for Turbonomic usage of the historical database.

If you are running Turbonomic installed as an OVA, and using the database that is included in that OVA installation, then *you must use version 10.5.6*. For versions of Turbonomic that you installed as an OVA *before* version 8.0.6, it is likely that you need to update your MariaDB.

For information about updating your MariaDB instance, see "Verifying your MariaDB Version" in the latest version of the *Turbonomic Installation Guide*.

Required DB Capacities

For Turbonomic versions 8.0.6 or later, your historical database must provide certain storage size capacities. For MariaDB or MySQL installations, you must ensure your database provides the necessary messaging and logging capacity.

If you installed Turbonomic as an OVA, and use the included MariaDB for the historic database, the easiest way to set the correct capacities is to update your Turbonomic to version 8.0.7 or greater. For more information, see "Increasing your Database Capacities" in the latest version of the *Turbonomic Installation Guide*.

SQL Modes for External Databases

If you deploy Turbonomic to work with an external database instead of the included historical database, then you must specify the correct SQL modes for the database. Configure the database to support:

```
{ {ERROR_FOR_DIVISION_BY_ZERO,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION} }
```

In particular, the SQL modes should *not* include ONLY_FULL_GROUP_BY, NO_ZERO_IN_DATE, or NO_ZERO_DATE.

External DBs and Turbonomic Updates

If you have deployed Turbonomic with an external database server, for some updates you might need to manually create a new database and user for that deployment. This is important if your external database server is multi-tenant, or if your deployment does not grant administrative privileges to Turbonomic.

NOTE:

If your external database server is multi-tenant, or if your database server does not grant administrative privileges to Turbonomic, then you must continue with this configuration requirement.

Azure database services are multi-tenant. If you deployed an external database on Azure, this configuration requirement applies to you.

If you deployed your database server in a way that grants Turbonomic privileges to create new databases and new users, then the update will automatically create the required database. This configuration requirement does not apply to you and you do not need to take any action.

For some Turbonomic updates, the updated version includes new databases on the historical database server. If you are updating to one of these versions, then you must *first* create the new database, and a user account with privileges to access that database.

This table lists the Turbonomic versions that require new databases. If you are updating from an earlier version to one of these, you must create the indicated new databases. For example, if you are updating from version 8.0.0 to 8.1.1, then you must create the `repository` database and the `market` database.

Turbonomic Version:	New Databases:	Notes:
8.0.1	repository	If you are updating from a version earlier than 8.0.1, you must create a database named <code>repository</code> , and a user account named <code>repository</code> .
8.1.1	market	If you are updating from a version earlier than 8.1.1, you must create a new database named <code>market</code> , and a user account named <code>market</code> .

NOTE:

If you have already updated to one of these versions of Turbonomic, and you did not perform the steps to update your external DB, please contact your support representative.

To create the databases and users, you will:

- Manually create each required database

This includes creating the database in your DB instance, creating a user to access the database, and granting privileges to the user.

- Manually add each required database to your `cr.yaml` file

The `cr.yaml` file declares entries for each component database. Each entry names the component, and gives the user and password that the component can use to access that database. You must add a new entry for each new database.

To create a new database:

1. Connect to your external DB using a global account.

The account must have privileges to create databases and users. If you have specified `dbRootUsername` in the `cr.yaml` file, you can use that account.

2. Create the database, where `<New_Database>` matches the database name in the table above:

```
create database <New_Database>;
```

For example, to create a new `market` database, execute:

```
create database market;
```

3. Create the account that Turbonomic will use to access the database where `<New_Database>` matches the database name in the table above:

```
create user '<New_Database>'@'%' identified by 'vmturbo';
```

For example, to create a user for the `market` database, execute:

```
create user 'market'@'%' identified by 'vmturbo';
```

NOTE:

The value `vmturbo` is the default password that Turbonomic uses for all component database accounts. If you have manually created accounts with different credentials, you can do so for this database as well.

4. Set the user account privileges for the new user account, where `<New_Database>` matches the database name in the table above:

```
GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE, EVENT, TRIGGER ON <New_Database>.* TO '<New_Database>'@'%' ;
```

For example, to set account privileges for the `market` user, execute:

```
GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE, EVENT, TRIGGER ON market.* TO 'market'@'%' ;
```

5. Flush privileges to make the privileges take effect:

```
flush privileges;
```

Now that the new database is created in your external DB service, you must declare access to it the Turbonomic cr.yaml resource.

1. Open the .cr file for editing. The location of the file depends on the type of Turbonomic installation you are configuring.

OVA installation of Turbonomic:	Turbonomic on a Kubernetes node or node cluster:
<p>Open a SSH terminal session on your Turbonomic instance</p> <p>Log in with the System Administrator that you set up when you installed Turbonomic:</p> <ul style="list-style-type: none"> • Username: turbo • Password: [your_private_password] <p>Then edit the file:</p> <pre>/opt/turbonomic/kubernetes/operator/d eploy/crds/charts_v1alpha1_xl_cr.yaml</pre>	<p>Open the following file for editing:</p> <pre>deploy/crds/charts_v1alpha1_xl_cr.yaml</pre>

2. Add the credentials for the matching pod to access the new database.

Add the entry to the `properties:` section of the `cr.yaml` file, where `yourPassword` is the password that you assigned to that user account, `yourDBServer` is the qualified name of your external DB or your multi-tenant DB partition, and `<New_Database>` is the name of your new database. Declare the following in the entry you add:

```
<New_Database>:
  <New_Database>DbUsername: <New_Database>@yourDBServer
  <New_Database>DbPassword: yourPassword
```

For example, if you added the `market` database, the resulting `cr.yaml` file should be similar to the following. (Note that the `global` properties assume that you want SSL connections, and the database is MySQL):

```
properties:
  global:
    enableSecureDBConnection: true
    sqlDialect: MYSQL
    dbRootUsername: dbAdminUser@yourDBServer
    dbRootPassword: dbAdminUserPassword
  action-orchestrator:
    actionDbUsername: action@yourDBServer
    actionDbPassword: yourPassword
  auth:
    authDbUsername: auth@yourDBServer
    authDbPassword: yourPassword
  clustermgr:
    clustermgrDbUsername: clustermgr@yourDBServer
    clustermgrDbPassword: yourPassword
  cost:
    costDbUsername: cost@yourDBServer
    costDbPassword: yourPassword
  group:
    groupComponentDbUsername: group_component@yourDBServer
    groupComponentDbPassword: yourPassword
  history:
```

```
historyDbUsername: history@yourDBServer
historyDbPassword: yourPassword
plan-orchestrator:
  planDbUsername: plan@yourDBServer
  planDbPassword: yourPassword
topology-processor:
  topologyProcessorDbUsername: topology_processor@yourDBServer
  topologyProcessorDbPassword: yourPassword
repository:
  repositoryDbUsername: repository@yourDBServer
  repositoryDbPassword: yourPassword
market:
  marketDbUsername: market@yourDBServer
  marketDbPassword: yourPassword
```

After you have done this, you can update to the latest version of Turbonomic. (Note that upgrading applies changes to the version information in this file).

Transport Layer Security Requirements

By default Turbonomic requires Transport Layer Security (TLS) version 1.2 to establish secure communications with targets. Most targets should have TLSv1.2 enabled. However, some targets might not have TLS enabled, or they might have enabled an earlier version. In that case, you will see handshake errors when Turbonomic tries to connect with the target service. When you go to the Target Configuration view, you will see a Validation Failed status for such targets.

In particular, we have found that NetApp filers often have TLS disabled by default, and that the latest version they support is TLSv1. If your NetApp target fails to validate, this is could be the cause.

If target validation fails because of TLS support, you might see validation errors with the following strings:

- No appropriate protocol
To correct this error, ensure that you have enabled the latest version of TLS that your target technology supports. If this does not resolve the issue, please contact Technical Support.
- Certificates does not conform to algorithm constraints
To correct this error, refer to the documentation for your target technology (for example, refer to NetApp documentation) for instructions to generate a certification key with a length of 1024 or greater on your target server. If this does not resolve the issue, please contact Turbonomic Technical Support.

Improvements

- **Improvement:**

Customer Issue 114833

For HPE 3Par targets, you can now specify the Web Services API Port.

For some HPE 3PAR installations, to configure a valid target you must include the port for the Web Services API. The 3PAR target user interface now includes a field for adding the port number.

- **Improvement:**

Customer Issue

The Data Extractor now includes cost data for individual entities on the cloud.

The Data Extractor now generates the `entity-cost` data table. This gives cost data for individual entities in your cloud environment.

Fixed Issues

- **Fixed Issue:**

Migrate to Cloud plans that are configured to migrate from one cloud provider to another can fail to complete.

When you configure a Migrate to Cloud plan, you can configure it to migrate from one cloud service to another. For example, you can configure the plan to migrate from AWS to Azure, or from Azure to AWS. When you configure such a migration, the plan can fail to complete.

- **Fixed Issue:**

Customer Issue 115492

For AWS, actions can incorrectly show multiple related business accounts.

For AWS environments, the details for a given action can show more than one related business account. This can occur when Turbonomic shows a separate business account for the related billing family.

- **Fixed Issue:**

Customer Issue 115468

For Dynatrace, analysis does not discover heap utilization for Java applications.

For Dynatrace environments, Turbonomic does not discover heap utilization for Java applications.

- **Fixed Issue:**

Customer Issue 115463,115740

For Azure, analysis reports failed Volume Scale actions as having succeeded.

For Azure environments, Turbonomic shows failed Volume Scale actions as having succeeded in the user interface and in logs.

- **Fixed Issue:**

Customer Issue

After the licensed workload capacity has been exceeded, you can still add targets via the API.

Turbonomic licensing specifies the number of workloads you can manage via targets. However, if you exceed the licensed capacity of workloads, you can still add new targets via the API, which increases the workload count.

- **Fixed Issue:**

Customer Issue 115236

For HPE OneView, under some circumstances the target cannot validate.

When you add an HPE OneView target, under some circumstances validation encounters an error and cannot complete.

- **Fixed Issue:**

Customer Issue 115275,115334

For VMM environments, dynamic groups based on storage providers can be incomplete.

For VMM environments, under some circumstances when you create a group of VMs that use a given storage provider, the group can fail to include all the VMs that use that storage provider.

- **Fixed Issue:**

For Storage groups, the Entity Details panel can show incorrect metrics.

When you set the scope to a group of storage entities, and then display the Entity Details panel, the details can be incomplete or they can include inappropriate data fields.

- **Fixed Issue:**

Customer Issue 115229,115726

For scoped users, under some circumstances the user interface does not show all the actions that scoped user should be able to see.

For a scoped user, if actions impact some entities that are out of the user's scope, but the specific action entities are within the user's scope, under some circumstances the user interface does not report those actions to the scoped user.

- **Fixed Issue:**

Customer Issue 115361

After executing a product update, Embedded Reports can fail to display data.

Under some circumstances, after updating Turbonomic the Embedded Reports feature can lose privileges to read the stored data.

- **Fixed Issue:**

Customer Issue 115256

For cloud environments with DataDog targets, analysis can use incorrect values for VCPU utilization.

for public cloud environments that include DataDog targets, under some circumstances analysis can incorrectly use the VCPU values that are discovered by DataDog. This can result in incorrect recommendations.

Analysis should use the values discovered by the target that directly manages the given VM. If there is only DataDog data, then analysis must use that data correctly.

- **Fixed Issue:**

Customer Issue 115130

Under some circumstances, analysis can recommend storage move actions for suspended VMs.

Under some circumstances, analysis can recommend storage move actions for suspended VMs. However, you cannot execute move actions on a suspended VM.

- **Fixed Issue:**

Customer Issue 115109,115632,115709

For Azure, after updates to new versions, under some circumstances discovery can fail to discover all the database entities in the environment.

For Azure environments, after an update to a new version, discovery can fail to discover all the Azure database entities in your environment. This can occur if the update changes permissions that are assigned to the database templates cache.

- **Fixed Issue:**

Customer Issue 114405

The Consumption Summary of Physical Resources for Virtual Machines report can show incomplete data.

When you change the time scale for the **Consumption Summary of Physical Resources for Virtual Machines** report, the charts can show incomplete data.

- **Fixed Issue:**

Customer Issue 113946,114196,114252,115725

Under some circumstances the Embedded Reports feature does not email subscribed reports.

Under some circumstances the Embedded Reports feature does not email subscribed reports to the indicated recipients.

Known Issues

- **Known Issue:**

Updates from version 7.22.6 to version 8.2.0 can fail to complete.

If you are updating Turbonomic from version 7.22.6 to version 8.2.0, *and* you have enabled Embedded Reporting, then the update can fail to complete. If this occurs, recover the snapshot of your original installation and try to update to an earlier version (for example, 8.1.6). Then try to update that version to 8.2.0.

If the problem persists, please contact your support representative.

- **Known Issue:**

If you update from versions 8.1.4, 8.1.5, or 8.1.6, then Embedded Reports can fail to connect.**NOTE:**

If you *initially installed* Turbonomic as version 8.1.4, 8.1.5, or 8.1.6, this note applies to you.

If you have enabled Embedded Reports for your installation, then update to version 8.2.0 or later, under some circumstances the Embedded Reports page can fail to load when you click **Reports**. If this occurs, it is because the `grafana` pod failed to start up and enter the ready state.

If you experience this, you will not lose any data, and the Embedded Reports database still collects the Turbonomic data as usual. After you restart the `grafana` pod, your reports will show continuity of data.

To regain connection to the Reports page, restart the `grafana` pod:

1. Open an SSH terminal session to your Turbonomic instance.

Log in with the System Administrator that you set up when you installed Turbonomic:

- Username: `turbo`
- Username: `[your_private_password]`

2. Restart the `grafana` pod.

```
kubectl scale --replicas=0 deployment grafana
```

3. Verify that the `grafana` pod is running.

Give the platform enough time to restart the pod, then execute the command:

```
kubectl get pods -n turbonomic
```

You should see output similar to the following:

NAME	READY	STATUS	RESTARTS
...			
<code>grafana-5f41dd61c4-4d61q</code>	<code>1/1</code>	<code>Running</code>	<code>0</code>
...			

- **Known Issue:**

For Fabric environments, when you scope the view to Datacenter the supply chain can fail to include all the related Host entities.

For environments that include Fabric targets, under some circumstances a view that you scope to the Datacenter might not include all the related Host entities. This can happen for hosts that include the hyphen character ("-") in the Host name. For example, for Cisco UCS targets, the supply chain will not show UCS hosts (that use the hyphen character in their names) when when you scope to the Datacenter entity.

- **Known Issue:**

When running the Migration Tool, the process can fail to migrate HCI Host templates from Classic to XL.

When you run the Migration Tool to migrate a Classic installation of Turbonomic to XL, the tool can fail to migrate HCI Host templates that you have defined on your Classic installation. If it fails, you will see a log message similar to:

```
Error: HTTP Status: 400 - Wrong field spaceReservationPct for template of entity type 0
```

If this occurs, you should refer to the HCI template definitions on your Classic installation, and redefine the missing templates on your XL installation.

- **Known Issue:**

After you change which user has Report Editor privileges, it can take 30 minutes for the change to take full effect.

For Embedded Reports, you can specify which Turbonomic user has Report Editor privileges. If you grant these privileges to a different user, it can take up to 30 minutes before the Reports page will show the Report Editor username.

- **Known Issue:**

Customer Issue 115352,115394,115453

Updates to the product should always use the latest Operator.

When you update Turbonomic you should be sure to always include the latest version of Operator in the update. When you perform an online or offline update according to the instructions in the Installation Guide, the procedure should automatically include the latest Operator.

A symptom you might see if you do not have the latest Operator is that the Embedded Reports component (the `grafana` pod) fails to start up.

If you need to install the latest Operator manually, you can execute:

```
sudo docker pull turbonomic/t8c-operator:8.1
```

- **Known Issue:**

Customer Issue 114942

With Executed Actions charts, some data is missing for actions on entities that have been removed from the environment.

When you view Executed Actions charts or export data from them, some data is missing for actions on entities that have been removed from the environment. For example, assume an action was executed on a storage volume, and that volume has later been removed from the environment. In that case, the exported data for that action will not include values that describe the removed volume.

- **Known Issue:**

The Onboarding wizards can sometimes fail to close.

When you first install Turbonomic, the user interface displays onboarding wizards to walk you through setting up your license, and configuring your first target. Under some circumstances, the button to end the wizard's work flow does not close the wizard. That can result in blocking you from continuing on with your Turbonomic session.

If the onboarding wizard does not close when you click **End Setup**, refresh the browser. That should close the the wizard and leave you on the last user interface page that you visited.

- **Known Issue:**

For Hyper-V, Hardware Replace plans that use HCI Host templates can give inconsistent results.

For Hyper-V environments, if you run a Hardware Replace plan that replaces hosts with HCI Host templates, the results can be inconsistent. Under some circumstances the plan can fail to place all the VMs in the plan scope.

- **Known Issue:**

For plans that were run in earlier versions, the plans cannot load Azure RI Buy actions when you view them in later versions.

For plans that were run in versions 8.0.7 or earlier, the plans cannot load Azure RI Buy actions when you view them in later versions.

Because of anomalies that can appear in the RI pricing data that Azure sends to Turbonomic, it was necessary to change the pricing data that analysis uses. This has no impact on real-time analysis. However, if you load a plan that was run in an earlier version, and that plan includes Buy RI actions, then those actions will not appear in the plan.

- **Known Issue:**

For policies that exclude certain cloud tiers, when the cloud provider adds new tiers they can appear as included in the policy.

For public cloud environments, when you make a policy to include only certain tiers (VM or Storage types) of entities, if the service provider deploys new tiers then those will also be included in your policy.

This can be unexpected. For example, assume you create a policy to include only one VM type. Then if your service provider introduces new VM types, your policy will subsequently include those new types.

You should periodically check your policies to see if new tiers have been added to the INCLUDE list.

- **Known Issue:**

For Kubernetes environments, when you enable Feedback and Diagnostics for your installation, the collected data can include Kubernetes cluster names.

To help us improve the product, you can enable Turbonomic to collect anonymized and non-confidential data as you go about using the product. However, because of the way Kubernetes discovery works for Turbonomic, the collected data includes the names of any Kubernetes clusters that you have set up as targets. We do not make use of those cluster names in any way.

If you do not want Turbonomic to collect these cluster names, then you can navigate to **Settings / Maintenance Options / Feedback and Diagnostics** and turn off the option to share anonymized usage data.

- **Known Issue:**

For environments with SNMP targets, analysis can show incorrect values for memory.

For environments that include SNMP targets, under some circumstances Turbonomic can discover incorrect memory values for Linux systems. This can occur for the systems that use the net-snmp package, version 5.7.2-43.el7. You should use versions less than 5.7.2-43.el7, or greater than or equal to 5.7.2-47.el7.

- **Known Issue:**

Changes to a policy do not immediately show up in the user interface view of the affected scope.

When you set the scope of the Turbonomic view to a group, you can then view the automation policies that impact the given group. If you edit a policy for that group (in Settings: Policies), and then scope the view to that group again, the policy changes do not appear in the display for that group.

The display should update within ten minutes, after the next round of incremental discovery. If the condition persists, log out of your session and log in again to update the display.

- **Known Issue:**

Customer Issue 113340

Hitachi Vantara targets can incorrectly show multiple compliance actions.

For Hitachi Vantara environments that enable storage replication, Turbonomic can generate repeated actions of the type, `Reconfigure Storage to Provide Extent`. In addition, replica storage entities and their providers can show incorrect utilization values.

- **Known Issue:**

When creating an automation policy, you can assign two or more schedules to the Action Execution Schedule setting. If the action is one that cannot be executed by Turbonomic, then for Service Now integrations the action appears in the Change Requests for display, only. Also, such an action is *only* affected by the first schedule in the policy.

- **Known Issue:**

For Migrate to Cloud plans, under rare circumstances the plan's actions list can show duplicate entries.

For Migrate to Cloud plans, under rare circumstances the plan's actions list can show duplicate entries.

- **Known Issue:**

For Azure environments, discovery does not support the Brazil Southeast region.

For Azure environments, Turbonomic does not discover the Brazil Southeast region. Azure provides this region only to give business continuity and disaster recovery to workloads in Brazil South that require data residence.

The user interface does not display the Brazil Southeast region in any lists or charts. Also, if you do have workloads on that region, Turbonomic will not discover those workloads.

- **Known Issue:**

For ServiceNow environments, Turbonomic fails to save any automation policy that sets the Action Type to **Request Approval from ServiceNow**.

- **Known Issue:**

For AppDynamics environments, the platform cannot discover databases if the target authentication uses oAuth for credentials.

For AppDynamics environments, Turbonomic cannot discover databases if the target authentication uses `oAuth` for credentials.

- **Known Issue:**

For existing dashboards that include the Capacity And Usage chart for databases, after an upgrade to 7.22.7 or later, the chart can appear empty.

Starting with version 7.22.7, Turbonomic tracks the DTU and Storage Amount commodities for databases. Charts that you configured for earlier versions will not include these commodities. To correct this, edit the charts to display the DTU and Storage Amount commodities. Also, when you create a new Capacity and Usage chart for databases, you must configure it to show these commodities.

- **Known Issue:**

For Application Component automation policies, the user interface allows you to make conflicting settings.

The Action Generation setting can show incorrect values that you can choose for the policy. As a result, you cannot save the policy.

- **Known Issue:**

For ServiceNow environments, the user interface allows you to set orchestration for actions that the ServiceNow integration does not support.

For ServiceNow environments, the Turbonomic user interface allows you to set orchestration for actions that the ServiceNow integration does not support. If you configure orchestration for these actions, then either the action never generates a ServiceNow CR, or the action can fail when the CR is approved.

The actions you can configure but will not generate a CR are:

- Storage Suspend
- VSan Storage Resize

Note that storage resize for a VSan is accomplished by provision/suspend of Host. You should not configure ServiceNow orchestration for VSan Storage Resize. However, Host Provision is not currently supported for ServiceNow orchestration (see next).

- Host Provision
- File Delete
- Application Component - No actions are supported

The actions you can configure but that can fail include actions that you must also configure for execution on the affected targets. These actions include:

- Host Suspend

For this action to succeed, it must be enabled in the given hypervisor, and there must be no VMs currently running on that host.

- Storage Provision

Currently Turbonomic can only execute a CR for this action on Pure and Dell Compellent storage.

- **Known Issue:**

The user interface does not currently show the billed costs for those Azure resource groups.

For Azure environments, when you inspect resource groups, Turbonomic does not currently show the billed costs for those resource groups.

- **Known Issue:**

Customer Issue 111396

For cloud environments, under rare circumstances analysis can recommend resizing a VM to an instance type that is older and less capable than an equally priced instance type.

Under most circumstances, when a cloud provider offers a new instance type that is meant to replace an older type, the provider offers it at a lower cost. In at least one instance we have seen a case with identical costs for the newer and older instance types. If this occurs, and capacity and cost are equal, Turbonomic cannot ensure that it chooses the newer instance type.

To work around this issue, you can create an Action Automation policy that excludes the older instance type.

- **Known Issue:**

The All Actions chart does not include pending actions for databases or database servers.

The All Actions chart does not include pending actions for databases or database servers.

- **Known Issue:**

Customer Issue 110123

There is a memory limit for the data you can download from the All Actions chart.

There is a memory limit for the data you can download from the All Actions chart. For example, assume you have executed many actions over time in your environment. As a result, the list of all executed actions might exceed the data limit. In that case, downloading a CSV file from the All Actions chart will fail.

- **Known Issue:**

Under rare circumstances, the etcd.service can fail.

Under rare circumstances the Turbonomic platform stops responding. This occurs when `etcd.service` fails. When it does occur, you should see the following error:

```
Error response from daemon: endpoint with name etcd1 already exists in network host
```

To recover from this situation, restart the docker service for the Turbonomic platform. execute the command: `sudo systemctl restart docker.service`

- **Known Issue:**

You must use certain templates when using PLACE to set up reservations or deployments.

When you use the **PLACE** page to set up a reservation or a deployment, you choose the templates to represent the workload you will deploy. The templates you choose must include an **Image** specification that gives the path to the VM package, and optional placement constraints.

Typically, you will use templates that are discovered through your hypervisor targets. Along with discovering resource capacities for the given VM, Turbonomic should also discover the Image specification for a given discovered template. However in this version, Turbonomic does not discover the Image descriptions. In addition, discovered templates and their image specifications are read-only. For this reason, you cannot set up placement or reservations using discovered templates.

- **Known Issue:**

For resources that do not support Reserved Capacity, charts can show them with zero reserved capacity.

Ring charts that show the utilization of different resources show a yellow segment whenever the Reserved Capacity for the resource is zero. For some resources there is no concept of reserved capacity, yet the ring chart still shows a yellow segment.

- **Known Issue:**

Optimized Improvements for plans do not include hosts to provision.

For cases where actions indicate provisioning new hosts, the Optimized Improvements chart does not include the hosts to provision in the After Plan section.

- **Known Issue:**

Customer Issue 99189,99805

In vCenter environments, you might see high storage latency, or excessive storage provision.

In vCenter environments, you might see unusually high storage latency values or excessive recommendations to provision new storage. There is a known problem with the storage latency values that vCenter Server versions 6.5.u1x and earlier return via the API. These versions can return unusually high storage latency values.

Turbonomic considers storage latency when calculating whether to move a VM to existing storage, or whether to provision new storage. Because of this known problem, Turbonomic can incorrectly recommend provisioning storage when moves are appropriate.

If you encounter this problem, then you should create a policy that disables storage moves for VMs that are managed by vCenter Server versions 6.5.u1x and earlier. To create this policy:

- Create a VM group that contains all the affected VMs. Note that Turbonomic automatically creates a group named `VMs_vCenter` that you might be able to use.
- Create a new VM automation policy. This policy will disable storage move actions.
- Set the group that you created to be the policy scope.
- Under **Action Automation** add the `Storage Move` action and set it to `Disabled`.

- **Known Issue:**

The Optimal Improvements chart can show incorrect data for hosts to be suspended.

In cases where actions recommend that you suspend hosts, the Optimal Improvements chart should indicate no utilization on the hosts to be suspended. Under some circumstances, the chart can show utilization on these hosts. The result is incorrectly low values for utilization on the other hosts in the current scope.

- **Known Issue:**

For vSAN environments, under some circumstances a plan that is scoped to a datacenter can fail.

For vSAN environments, when running plans that add or replace hosts to the environment, under some circumstances the plan can show the incorrect count for hosts, and the plan can fail.

This can happen for plans that meet the following conditions:

- The plan type is `Hardware Refresh`, `Add Workload`, or `Custom`
- The plan scope is set to a datacenter, and it includes vSAN hosts
- The plan uses an HCI template to replace the hosts

After running, the plan shows the full count of hosts in the vSAN environment, instead of the count of hosts in the plan scope.

To avoid this situation, do not scope the plan to the datacenter.

- **Known Issue:**

Customer Issue 105693

The Headroom chart for All On-prem Hosts does not always agree with the Top Clusters chart.

The Headroom chart for All On-prem Hosts does not always agree with the Top Clusters chart.

Turbonomic generates the All On-prem Hosts headroom data in a nightly plan. When the plan runs, this data is correct. In the course of the day, this data can become stale.

To accurately track your cluster usage, you should use the Top Clusters chart.

- **Known Issue:**

Customer Issue 107699,108212,109349,110474,110896,112196,112639,112749,112790,113104,114386,115748

Hardware Refresh plans to replace hosts can give unexpected results.

When you run a plan to replace hosts in a cluster, the results can incorrectly show that you need more hosts than you would expect. This can occur for two reasons:

- If the host template for the replacements does not use CPU specifications from the catalog, then the calculations for host capacity can be incorrect.
- When placing VMs on the replacement hosts, analysis assumes all the VM peaks can occur at the same time. This results in excessive utilization of peaks capacity in the plan.

To configure a plan in a way that avoids these problems, you can:

- Make sure the plan scope is for a single cluster.

This is the typical use case for a Replace Hosts plan. Record the cluster name, because the name will come in handy in later steps.

- Always use the **Select from Catalog** option when you create your Host template.

If the catalog does not include the CPU specifications that you want, choose an entry that is as close as possible.

To adjust the number of cores, you can then specify a different number of sockets. For example, assume you choose a CPU spec that includes 4 cores of a given core frequency, but you actually want 32 cores. You can choose that spec, and then set **Sockets** to 8 to achieve that number.

- Turn off **Scale** for the VMs.

After you choose the host template to use, click **NEXT: VIRTUAL MACHINE ACTIONS**. Then turn off the **Scale** option.

When replacing hosts, it's important to *not* scale the VMs, so you can see how the hosts can support your given workload.

- Replace all your VMs with a Cluster Average template.

Click **SKIP TO CONFIGURATION** to display the plan configuration, and open **Replace/Virtual Machine**. Display **Clusters** and click **Select all**. Then click **NEXT** to choose the VM template.

To choose the VM template you will replace with, type your cluster name in the Search box. The Templates list will show an AVG template for that cluster. For example, if your cluster name is MyCluster1, then the template name would be `myDomain.com: :AVG:MyCluster1`. This template captures the average VM utilization over the last ten days.

Choose this template and click **SUBMIT**.

- You can now run the plan.

- **Known Issue:**

For vCenter Server environments, Turbonomic does not recognize DRS rules for VM restart dependencies that are based on ClusterDependencyRule.

For vCenter Server environments, Turbonomic does not recognize DRS rules for VM restart dependencies that are based on `ClusterDependencyRule`.

You might be able to achieve a similar effect by expressing dependencies via `ClusterVmHostRule` or cluster affinity or antiaffinity rules.