Turbonomic 8.1.1 Release Notes

March 1, 2021

This document describes issues that are addressed in Turbonomic 8.1.1 – Release Date: March 1, 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 8.1.1, 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 8.1.1

Version 8.1.1

- **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*.

- **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.

- **Embedded Report Enhancements**

  ◦ If you have enabled Embedded Reports in your Turbonomic instance, you can now create custom reports by running SQL queries against the instance's Embedded Reports database.

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

  ◦ Turbonomic now collects the following data for Embedded Reports:

    ▪ Metrics: Peak and cluster headroom values

    ▪ Actions: Percentile values for current actions

  ◦ To manage Embedded 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.

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:

`{{STRICT_TRANS_TABLES,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 `depository` 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 `repository`, and a user account named `repository`.
8.1.1	`market`	If you are updating from a version earlier than 8.1.1, you must create a new database named `market`, and a user account named `market`.

> **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 the 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, CREAT
    E TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, A
    LTER 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, CREAT
    E TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, A
    LTER 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:
Open a SSH terminal session on your Turbonomic instance Log in with the System Administrator that you set up when you installed Turbonomic: • Username: `turbo` • Password: `[your_private_password]` Then edit the file: `/opt/turbonomic/kubernetes/operator/d eploy/crds/charts_v1alpha1_xl_cr.yaml`	Open the following file for editing: `deploy/crds/charts_v1alpha1_xl_cr.yaml`

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 **vmturbo** is the password that you assigned to that user account, **yourDB** 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>@yourDB
       <New_Database>DbPassword: vmturbo
   ```

   For example, if you added the `market` database, the resulting cr.yaml file should be similar to:

   ```
   properties:
       global:
           enableSecureDBConnection: true
           sqlDialect: MYSQL
           dbRootPassword: yourPassword
           dbRootUsername: xladmin@yourDB
           #dbUserPassword:
           #dbUsername:
       action-orchestrator:
           actionDbUsername: action@yourDB
           actionDbPassword: vmturbo
       auth:
           authDbUsername: auth@yourDB
           authDbPassword: vmturbo
       clustermgr:
           clustermgrDbUsername: clustermgr@yourDB
           clustermgrDbPassword: vmturbo
       cost:
           costDbUsername: cost@yourDB
           costDbPassword: vmturbo
       group:
           groupComponentDbUsername: group_component@yourDB
           groupComponentDbPassword: vmturbo
   ```

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

After you have done this, you can update to the latest version of Turbonomic and then apply the cr.yaml 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:**

  This release includes more plan types for Virtual Machine Manager (VMM) private clouds.

  For a VMM environment, you can now configure and execute Hardware Refresh plans and Custom plans.
- **Improvement:**

This release improves navigation when you click on action type headers.

When you click on the action type header in the Pending Actions chart, the user interface now displays the complete Pending Actions table.

- **Improvement:**

Reservations in the Placement view are more robust.

With this release, we have introduced changes to retain cached data for reservations even if you restart the `market` component. We now persistently store reservation data in the historical database.

> **NOTE:**
> If you have deployed Turbonomic with an *external* database, you might need to manually create a new database table and user for that deployment. This is of concern if you update *from* version 8.1.0 or earlier *to* version 8.1.1 or later, and you have deployed an external database. For more information, see External DBs and Turbonomic Updates *(on page 3)*.

- **Improvement:**

You can now enable analysis of on-prem virtual volumes.

This version of Turbonomic introduces a new Global Default setting, `Enable analysis of on-prem Virtual Volume`. This setting enables the product to generate the commodities and perform the analysis required to execute actions on individual virtual volumes.

> **NOTE:**
> We offer this feature as a public preview. Feature details might be subject to change.

- **Improvement:**

For Embedded Reports, this release updates the Grafana version that it uses.

This release now uses version 7.3 of Grafana for Embedded Reports. For information about this version, see What's new in Grafana v7.3.

Fixed Issues

- **Improvement:**

This release includes more plan types for Virtual Machine Manager (VMM) private clouds.

For a VMM environment, you can now configure and execute Hardware Refresh plans and Custom plans.

- **Improvement:**

This release improves navigation when you click on action type headers.

When you click on the action type header in the Pending Actions chart, the user interface now displays the complete Pending Actions table.

- **Improvement:**

Reservations in the Placement view are more robust.

With this release, we have introduced changes to retain cached data for reservations even if you restart the `market` component. We now persistently store reservation data in the historical database.

> **NOTE:**
> If you have deployed Turbonomic with an *external* database, you might need to manually create a new database table and user for that deployment. This is of concern if you update *from* version 8.1.0 or earlier *to* version 8.1.1 or later, and you have deployed an external database. For more information, see External DBs and Turbonomic Updates *(on page 3)*.

- **Improvement:**

  You can now enable analysis of on-prem virtual volumes.

  This version of Turbonomic introduces a new Global Default setting, `Enable analysis of on-prem Virtual Volume`. This setting enables the product to generate the commodities and perform the analysis required to execute actions on individual virtual volumes.

  > **NOTE:**
  > We offer this feature as a public preview. Feature details might be subject to change.

- **Improvement:**

  For Embedded Reports, this release updates the Grafana version that it uses.

  This release now uses version 7.3 of Grafana for Embedded Reports. For information about this version, see What's new in Grafana v7.3.

Known Issues

- **Known Issue:**

  For Embedded Reports, we have updated the database schema.

  We have updated and hardened the database schema that we use for Embedded Reports. When you update to Turbonomic 8.1.1, the Embedded Reports will use this new schema. However, the documentation does not describe the effects you will see as a result.

  After you update Turbonomic your reports will begin their historical data from the time that you completed your update.

  To save your existing report data, the Embedded Reports page will include a folder named **Old Reports**. This folder is marked with the date that you performed your product update. It contains all of your reports, using historical data from before the change to the new schema. (If you want to merge the old reports with your new reports, please contact your support representative for assistance.)

  In addition, the report named "On-Prem Virtual Machine Rightsizing Recommendations" appears in the Old Reports folder, but it is empty.

- **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 Azure, you should exclude VM tiers with constrained vCPU from scopes that do not use constrained vCPUs.

For Azure environments, certain tiers of VM workloads specify vCPU constraints as a way to reduce software licensing costs. However, the costs that analysis can discover for licensing of OS and some other software does not consistently show the appropriate savings.

If your environment does not use constrained vCPU, you should create a global Cloud Tier Exclusion policy that excludes vCPU-constrained VM tiers. If your environment does include scopes of vCPU-constrained workloads, then you can define groups for those workloads and override the exclusion policy.

• **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 anomolies 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 an 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 discovery of AWS Savings Plan data, you must enable specific permissions.

For AWS environments, the Target Configuration Guide does not include the permission that you need to set to enable discovery of AWS Savings Plan inventory and details.

To enable discovery of AWS Savings Plan inventory and details, include `savingsplans:DescribeSavingsPlans` to the set of permissions that you assign to the account that Turbonomic uses to connect with the AWS target.

• **Known Issue:**

You cannot re-execute Migrate To Cloud plans that were configured on earlier releases of the platform.

Migrate to cloud plans created on Turbonomic versions 8.0.5 or earlier cannot not be re-executed. Starting with version 8.0.6 or earlier, the plan configuration requires a specification of the destination account for the migration.

- **Known Issue:**

  Customer Issue 113739

  Optimize Cloud plans can give inaccurate RI recommendations if you disable all actions.

  If you turn on the Disable All Actions setting in the global default policy and then run an Optimize Cloud plan with VM scaling and RI purchases enabled, the plan results show inaccurate RI recommendations.

  Turn off Disable All Actions to resolve this issue. Be aware that after you turn off this setting, it will take Turbonomic a week to reflect accurate results in Optimize Cloud plans.

- **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:**

  When you generate placement and reservations, you must be sure the associated Headroom calculations reflect changes to your environment.

  When creating placement and reservations, analysis makes use of the last-generated Headroom data. This data is generated in nightly-run headroom plans. If you have changed your environment by adding targets or changing policies, then you should wait until the next run of headroom plans for the affected scope before you create placement or reservations.

- **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:**

  For Azure environments, under some circumstances analysis can repeatedly recommend and fail to execute a VM resize action.

  For Azure environments, under some circumstances Turbonomic can repeatedly recommend and fail to execute a VM resize action.

Within an Azure subscription, Turbonomic can recommend resizing a VM to an instance type that is no longer supported in the given region. Wen this occurs, the action fails (correctly) and includes the following in the log message:

```
We do not have sufficient capacity for the requested VM size in this region.
```

This behavior is as expected. However, after encountering this error Turbonomic can repeatedly recommend the same resize action. If you encounter this situation, you can manually resize the VM to a similar, but supported instance type.

- **Known Issue:**

  For Azure, cost discovery can fail when connecting to the target through a proxy.

  For Azure environments where Turbonomic is configured to use a proxy for connections to the Azure target, under some circumstances discovery can fail to get cost data. This can occur when the proxy is via HTTPS, or it requires authentication to connect with an Azure EA target.

- **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:**

  For Azure, historical data for a deleted storage volume can appear for a newly created volume.

  Assume you have deleted a certain volume from your environment, and then deploy a new volume with an identical name. In that case, charts will include historical data from the volume that you deleted.

- **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 Azure environments, delays in updates to billing information can result in analysis that uses partial billing data for RIs in undiscovered subscriptions.

For the Partial RI feature, in Azure environments there can be delays in updates to billing information that Azure makes available to Turbonomic. In that case, there can be times when analysis uses partial billing data in its calculations. When showing utilization of RIs that are discovered outside of the targeted Azure subscriptions, this can result in changing costs for those RIs.

• **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:**

Customer Issue 112461

If you have configured MySQL 5.7 as an external database, you can experience poor performance when working with dynamic groups.

If you have configured MySQL 5.7 as an external database for your Turbonomic installation, under some circumstances you can experience poor performance when working with dynamic groups. This can happen when you use extensive regular expressions as filters to generate the dynamic groups.

If you experience poor performance with dynamic groups, consider making them static groups, or consider using MariaDB as your database.

• **Known Issue:**

Customer Issue 112327

When you download the data for Pending Actions, the download might not match the data that you see in the Pending Actions chart.

Under some circumstances, when you download the data for Pending Actions, the download does not match the data that you see in the Pending Actions chart. This can happen when the categories that the Pending Actions chart uses to groups actions do not contain the correct actions. The actions are all correct, and the downloaded data groups the actions correctly.

• **Known Issue:**

When you download a CSV file from an Actions chart, the CSV file only contains the list of actions that show in the current page of data.

When you download a CSV file from an Actions chart, the CSV file only contains the list of actions that show in the current page of data. As a result, if the actions for the current scope of the chart exceed the number of entries in the page, the CSV data will be incomplete.

• **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 AWS pyment plans that are not 1-year or 3-year terms, AWS does not return pricing data.

For AWS environments, under very rare circumstances you can have RIs on payment plans that do not resolve to 1-year or 3-year terms. In this case, AWS does not return pricing data for those RIs. Turbonomic does not include such RIs in its calculations of RI utilization or RI cost.

• **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:**

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.