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# Turbonomic 8.1.0 Release Notes

February 12, 2021

This document describes issues that are addressed in Turbonomic 8.1.0 – Release Date: February 12, 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 8.1.0, 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](mailto:support@turbonomic.com), or open a ticket at:

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

## What's New for Version 8.1.0

### Version 8.1.0

- **Cloud Resource Management**

This release introduces key features and enhancements to help optimize your cloud workloads' performance and reduce your cloud expenditure.

- **Support for Cloud Volumes**

- Turbonomic can now recommend scaling your AWS and Azure volumes. It uses percentile calculations to drive more accurate scaling actions, and indicates whether these actions are non-disruptive or reversible. With these capabilities, you can execute scaling actions with confidence.

For details, see "Supply Chain - Volume" in the *User Guide*.

- To help reduce your cloud costs, Turbonomic can recommend deleting cloud volumes that are not attached to any VM. When you examine a pending *Delete* action for a volume, you will now see additional

information to help you decide whether to execute the action, including the number of days the volume has been unattached and the name of the last attached VM.

For details, see "Volume Actions" in the *User Guide*.

- This release introduces support for AWS *gp3* volumes. Turbonomic can recommend scaling and delete actions for these volumes to optimize performance and costs.

- **Azure SQL Database Scaling**

This release introduces support for Azure SQL Databases that use the DTU (Database Transaction Unit) purchase model. Turbonomic automatically discovers these databases when you add Azure targets, and then presents them as *Database* entities in the supply chain.

Turbonomic monitors DTU and storage utilization for the databases, and uses percentile calculations to drive more accurate scaling actions.

For details, see "Supply Chain - Database" in the *User Guide*.

- **Full RI Inventory for Partial Cloud Environments**

When you add an Azure EA account or an AWS master account as your primary cloud target, Turbonomic gains full insight into the RIs for your billing families. Even as you selectively add Azure subscriptions or AWS member accounts as secondary targets, Turbonomic remains aware of all RIs and how they are utilized across the board, and can thus recommend more accurate RI actions for your cloud environment.

The RI Inventory Chart shows your full RI inventory, and includes visual hints to help you identify RIs in subscriptions and accounts that you have not added as targets. For details, see "RI Inventory Charts" in the *User Guide*.

**NOTE:**

For AWS, if you do not add a master account, Turbonomic shows a partial inventory of your RIs.

- **Support for AWS Savings Plans**

Turbonomic now discovers AWS Savings Plans when you add an AWS account with read-only access to the AWS Savings Plans API. To see a list of discovered Savings Plans, add the RI and Savings Plans Inventory chart to your dashboard.

For more information on Savings Plans, visit:

<https://aws.amazon.com/savingsplans/>

- **Improvements and Enhancements**

- You can now direct Turbonomic to only execute cloud VM scaling actions that improve performance or reduce costs. When you create a policy for the cloud VMs, choose the **Cloud Scale for Performance** or **Cloud Scale for Savings** option, and then set the action mode to *Automatic* or *Manual*. If you set the action mode to *Manual* and then examine the pending actions for those VMs, only actions that satisfy the policy are allowed to execute. All other actions are read-only.

**NOTE:**

The scaling option **Cloud Compute Scale** has been renamed **Cloud Scale All**. This enables all scaling actions, including those that result in efficiency improvements and increased costs. When policy conflicts arise, **Cloud Scale All** overrides the other two scaling options in most cases. For more information, see "Relationship Between Scoped and Default Policies" in the *User Guide*.

- Migrate to Cloud plans now require you to choose a billing account (AWS account or Azure subscription) before selecting a region as the migration destination. In addition, you can now specify the RIs that the plans will use.

- Turbonomic now supports the `InstanceType` and `ImageId` dimensions for the Amazon EC2 metrics that it collects via CloudWatch. You can add these dimensions to the JSON file that you deploy to configure CloudWatch. For details, see "Enabling Collection of Memory Statistics: AWS" in the *Target Configuration Guide*.
- For Azure environments, Turbonomic now discovers updated RI cost data via the Azure cost catalog API. Previous releases used a static CSV file that was published by Microsoft.

- **On-Prem Resource Management**

The following key features are now available to help you manage your on-prem infrastructure more efficiently.

- **Demand Driven Reservations**

When making placement decisions for reserved VMs, Turbonomic now considers resource utilization values (consumed factors) set in VM templates, in addition to overprovisioning capacity. It then analyzes the current and historical utilization of cluster, host, and storage resources to identify the providers that can adequately handle demand when you deploy the actual VMs to your on-prem environment. With this feature, Turbonomic can make more accurate decisions and prevent congestion issues after you deploy the VMs.

For details, see "Place: Reserve Workload Resources" in the *User Guide*.

- **License Policy Enhancements**

Turbonomic can now recommend reconfiguring hosts in response to VM demand for software licenses. When demand exceeds capacity, and there are hosts in the cluster that currently do not provide licenses, Turbonomic can recommend reconfiguring those hosts to become providers. This is more efficient than provisioning new hosts. When demand is low, it can recommend removing licenses on hosts to reduce your costs, but will not recommend host suspension. Since the hosts remain active, they can be reconfigured when demand starts to exceed capacity.

To take advantage of these enhancements, enable the *Reconfigure* action in host automation policies after you create your license policies.

- **VM and Volume Stitching**

The supply chain now stitches on-prem VMs with the virtual volumes (disks) that they are attached to. When you set the scope to a VM, you will now see a list of attached volumes and any pending *Move* actions for these volumes.

For a list of VM-related files (such as VMDKs) contained in a virtual volume, see the Entity Information chart for the volume.

- **Container Resource Management**

Deploy the latest Kubeturbo image to take advantage of new features for container environments. For information about Kubeturbo releases, go to:

<https://github.com/turbonomic/kubeturbo/wiki/Server-Versions-and-Kubeturbo-Tag-Mappings>

- **New Container Entity Type**

This release introduces the **Container Cluster** entity type to represent Kubernetes clusters in the supply chain. This allows Turbonomic to fully link your container infrastructure with the underlying nodes, and then present all actions on containers and nodes in a single view. This gives you full visibility into the actions that impact the health of your container environment.

For details, see "Supply Chain - Container Cluster" in the *User Guide*.

- **New Container Dashboard**

This release includes a new predefined **Container Platform Dashboard**. Use the charts in the dashboard to assess the health of your Container Clusters, Namespaces, and Services.

- **Container Resizing Improvements**

- Resize actions no longer display when you scope to Containers, given their ephemeral nature. Set the scope to Container Specs to view the actions. You can execute actions via Workload Controllers as usual.

To automate actions, set the action mode for Resize actions as follows:

- Container Spec policies: Manual (default)
- Workload Controller policies: Automatic

For details about automating resize actions, see "Container Actions" in the *User Guide*.

- Resize constraints previously set in Container policies are now set in Container Spec policies. Constraints include increment constants and rate of resize.

**NOTE:**

Turbonomic does not migrate these constraints. Record them before updating to this version, and then add them to your Container Spec policies after updating.

- You can now create Container Spec policies to enable tuned scaling for vCPU/vMem limits and requests. With tuned scaling, Turbonomic automates resizes if the resize values fall within a normal range, and posts more conservative actions when resize values fall outside the range.

For details, see "Tuned Scaling for Container Specs" in the *User Guide*.

- In policies and actions, resize values for vCPU limits and requests are now expressed in millicores.

- **Namespace Labels and Annotations**

Turbonomic now discovers namespace labels and annotations as tag properties. You can filter namespaces by labels or annotations when you use Search or create Groups.

- **Supported Targets**

- Turbonomic now supports JVM Applications as targets, and can recommend resizing heap and thread pool capacity.

For details, see "JVM Application" in the *Target Configuration Guide*.

- Turbonomic now supports Oracle database servers as targets, and can recommend resizing their connection and transaction log capacity. It can also recommend resizing DBMem while taking cache hit rate into account.

For details, see "Oracle Database Server" in the *Target Configuration Guide*.

- Turbonomic has certified VMware vCenter 7.0 U1 as a hypervisor target.

- **Installation and Updates**

This release introduces improvements to simplify the OVA installation and online update process, and automatically update the MariaDB database that Turbonomic uses to store data.

For details about these improvements, see the Installation 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:

```
{ {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`.

## Multi-tenant External DBs and Updates to 8.0.1 or Later

### NOTE:

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

If you are updating from Turbonomic 8.0.0 or earlier to version 8.0.1 or later, *and* you have deployed an external MariaDB or MySQL database service that is multi-tenant, then you must update the database service before you update your Turbonomic instance. This modification includes:

- Manually creating a database for the `repository` component
  - This includes creating the database in your DB instance, creating a user to access the database, and granting access to the user.
- Manually adding the repository database to your `cr.yaml` file
  - For deployments that manually add the component databases (a requirement for multi-tenant DBs), the `cr.yaml` file declares entries for each component databases. 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 the `repository` component.

### NOTE:

If you have already updated to the latest version of Turbonomic, and you did not perform the steps to update your multi-tenant DB service, please contact your support representative.

To create the new database:

1. Connect to your multi-tenant 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 that the `repository` pod requires:

```
create database repository;
```

3. Create the account the pod will use to access the database:

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

**NOTE:**

The value `vmturbo` is the default password that 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 `repository` pod's account:

```
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 repository.* TO 'repository'@'%';
```

5. Flush privileges to make the privileges take effect:

```
flush privileges;
```

Now that the `repository` database is created in your multi-tenant DB service, you must declare the access in 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"> <li>• Username: <code>turbo</code></li> <li>• Password: <code>[your_private_password]</code></li> </ul> <p>Then edit the file:</p> <pre>/opt/turbonomic/kubernetes/operator/deploy/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 `repository` component 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, and `yourDB` is the qualified name of your multi-tenant DB partition::

```
repository:
  repositoryDbUsername: repository@yourDB
  repositoryDbPassword: vmturbo
```

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
    
```

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:**

**For Buy RI actions, the user interface now reminds you that you must execute associated scale actions.**

When Turbonomic generates a Buy RI action, it's possible that the environment cannot use the RI until you also resize the affected VMs. If that is the case, the user interface displays the following banner message to remind you:

```
IMPORTANT: Buy RI actions should be taken along with their related VM scaling actions.  
To buy RIs for VMs at their current sizes, run an Optimize Cloud Plan.
```

If you execute this Buy RI action, you should also resize the related VMs. If you run an Optimize Cloud plan, you can see which RIs to buy for the VMs at their current size.

## Fixed Issues

- **Fixed Issue:**

**For AWS, analysis does not discover Amazon Aurora database services.**

For AWS environments, discovery fails to include Amazon Aurora database services.

- **Fixed Issue:**

**Customer Issue 113856**

**Percentile calculation can fail with an exception.**

Under rare circumstances, when calculating percentiles for utilization, analysis can fail with `ArrayIndexOutOfBoundsException`

- **Fixed Issue:**

**Customer Issue 114135**

**For Microsoft SQL servers, analysis can generate unnecessary actions to reconfigure vStorage.**

For Microsoft SQL servers, if the underlying VM is not the storage provider, Turbonomic can generate unnecessary actions to `Reconfigure Database Server` to provide `VStorage`.

- **Fixed Issue:**

**Customer Issue 113954**

**Discovery does not receive pricing data for S3 database sources. As a result, actions for S3 databases can be invalid.**

Due to a temporary issue with Microsoft Azure Enterprise Agreement subscriptions, Turbonomic does not receive pricing data for S3 database sources. As a result, the user interface does not show pricing data for instances of S3 databases, and actions for S3 databases can be invalid.

- **Fixed Issue:**

**Customer Issue 113870,113944**

**For UCS environments that include vCenter Server datacenters, in some cases cluster names display the UCS chassis name instead of the cluster name.**

For UCS environments, after Turbonomic discovers clusters in vCenter Server, the cluster names can show the UCS chassis name instead of the vCenter cluster name.

- **Fixed Issue:**

**Customer Issue 113870**

**For environments that include UCS and vCenter Server targets, the supply chain can show an empty UCS datacenter**

Under some circumstances, after stitching a vCenter Server target into a UCS environment, you can scope the supply chain to UCS and see an empty datacenter. This can be confusing.

- **Fixed Issue:**

**In the user interface, charts can incorrectly show 100% utilization of resources.**

For VMM/Hyper-V 2019 environments, when Turbonomic is unable to retrieve accurate vMem utilization data for VMs for some reason, it might show 100% vMem utilization in the Capacity and Usage chart. It will, however, disable resize down actions in the background as a safeguard against incorrect actions.

- **Fixed Issue:**

**Customer Issue 113856**

**For large environments, the values for utilization percentile can be excessively high.**

In very large environments, the database transactions to maintain percentile values over time can exceed the allowed maximum size. This can result in incorrect percentile values, sometimes exceeding the existing utilization values.

- **Fixed Issue:**

**Customer Issue 113797**

**For groups with a '+' character in the group name, search filters cannot match the group by name.**

The matching that Turbonomic search uses does not match group names that include a '+' character.

# Known Issues

- **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:**

**Customer Issue 114355**

**For public cloud environments, under some circumstances calculation of RI utilization and RI coverage over time can be underestimated.**

In public cloud environments, the RI Coverage and RI Utilization charts track how your RI inventory is utilized in your environment. If you have many inconstant workloads (VMs that do not run 24/7), then analysis can underestimate the percentage of RI coverage over time. Analysis can also underestimate cost savings over time. The more inconstant workloads in your scope, the more these estimates can deviate.

- **Known Issue:**

**For Embedded Reports, you must only grant Report Editor privileges to a single user account.**

For embedded Reports, you can configure a single user account that has licensed privileges to edit reports, create PDFs, and set up email subscriptions. However, in this release of Turbonomic the user interface allows you to configure two such accounts -- One local user and one external user (AD or SSO user). You should *only* create a single Report Editor account for your installation.

- **Known Issue:**

**When you scope to a Billing Family, the RI Inventory chart does not display any data.**

When you choose a billing family as your session scope, the RI Inventory chart should display all the RIs that are available to that scope. However, the chart is empty.

- **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 embedded reports, the user cannot schedule reports to be emailed to subscribers.**

A Turbonomic administrator user should be able to schedule embedded reports to be emailed to subscribers. This requires an additional user role that is not available in the user interface.

To add the `report_editor` role to an administrator user, you can use the API. (For complete information, see the API Guide.) For example, you can use the SWAGGER UI to edit a user account with the following payload:

```
{
  "loginProvider": "LOCAL",
  "password": "MyPassword",
  "roles": [
    { "name": "report_editor" },
    { "name": "ADMINISTRATOR" }
  ],
  "type": "DedicatedCustomer",
  "username": "MyUsername"
}
```

- **Known Issue:**

**Customer Issue 114042,114085,114366**

**Under rare circumstances, after updating from an earlier version, automated actions can fail to execute.**

Under rare circumstances, after updating from version 7.22.4 or earlier, automated actions can fail to execute.

If you experience this issue, contact your support representative.

- **Known Issue:**

**For Migrate to Cloud Plans, Move Volume actions for on-prem VMs can show misleading volume names.**

In Migrate to Cloud plans, for on-prem VMs the storage migration actions that move multiple volumes can show just a single volume name for that action. This can be misleading because the plan actually moves all the affected volumes.

- **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 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. When 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:**

**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 group 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 payment 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.