



Turbonomic 6.0.9 Release Notes

March 23, 2018

This document describes issues that are addressed in Turbonomic 6.0.9 – Release Date: March 23, 2018. All builds are cumulative. Applying 6.0.9 onto any release of v5.9 or later will include all previous fixes. Please see the Turbonomic documentation for earlier versions of the Release Notes:

<https://greencircle.vmturbo.com/community/products/pages/documentation>

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

<https://greencircle.vmturbo.com/support>

What's New for Version 6.0

The 6.0 family of Turbonomic releases includes the following new features:

- **User Interface Enhancements**

The new HTML user interface is now the default. Thanks to customer feedback, we have improved a number of the views. New things to see include:

- **Dashboards Page** – Use this page to create custom dashboards that focus on specific areas of your environment.
- **Reporting Page** – Set up subscriptions to standard reports, and generate reports on-demand.
- **Home Page Overviews** – To help you focus on what's important to you, the Home Page now shows overviews for Hybrid, On-Prem, and Cloud environments. You can still use the Search Page to set a scope to your session and drill down to details.
- **Policies and Settings** – The new user interface now exposes a full range of settings for business rules and automation. Use these to set policies for different scopes in your environment.

- **Enhanced Public Cloud Support**

We continue to improve our support on the public cloud. With this release you can see:

- **Enhanced cost analysis**

When calculating placement and resource allocation for workloads on the cloud, Turbonomic uses real data from your cloud accounts to calculate actual cost. The information Turbonomic uses includes Compute

Costs for the workload templates you use, License Costs for the workload OS, Storage Costs based on the storage tier you are using, and IP Cost.

For cloud storage, Turbonomic identifies the right storage tier for your workloads, ensuring you get storage performance without paying more than you need. It also discovers stranded, or "ghost" storage. When you delete a VM in your environment, you can forget to delete the attached storage. Turbonomic discovers and suspends this stranded storage so you don't have to keep paying for it.

In addition, when planning a migration from on-prem to the cloud, Turbonomic can identify stable on-prem workloads that are good candidates for Reserved Instance (RI) pricing. The resulting plan shows the cost savings you can expect by migrating these workloads to RI.

- Relational Database Control

Turbonomic discovers database instances in your cloud environment, and manages them as it does VM workloads. Turbonomic analysis determines correct scaling of your database services, provisioning new instances when necessary and recommending suspension of instances when appropriate.

- Enhanced Target Support

This version of Turbonomic introduces the following target enhancements:

- EMC VPLEX – VPLEX aggregates and refines data collected between connected Storage and Hypervisor targets. Turbonomic supports EMC VPLEX in a local configuration.
- Cisco UCS Central – Cisco UCS Central aggregates multiple Cisco Unified Computing System targets onto a single point of management.
- Storage Logical Pools – With Hitachi Data Systems and EMC VMAX 3, Turbonomic discovers and manages logical pools in your storage network.
- Hyper-V – This release adds support of Hyper-V 2016, and includes a number of improvements to our Hyper-V support.

- Cloud-Native Enhancements

For OpenShift and Kubernetes environments, Turbonomic imports Node and Pod affinity constraints, and uses those constraints in its analysis. In addition, Turbonomic creates groups for containers.

Update Recommendations

You can apply this update to any GA version of Turbonomic from version 5.9 or later, if it is running on CentOS.

NOTE: If your Turbonomic installation is running on an older version, or if it is running on openSUSE, contact Turbonomic Technical Support to confirm your update path.

Update Links

Turbonomic 6.0.9 is available as an offline update. Please see the Green Circle article:

[How To Perform an Operations Manager "Offline Update" - Latest Links Included](#)

Related Green Circle Articles

- Offline and Online Update Instructions:
<https://greencircle.vmturbo.com/docs/DOC-1649>
- Release Notes and Product Documentation:
<https://greencircle.vmturbo.com/community/products/pages/documentation>

Configuration Requirements

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

Security Requirements for Browsers

For web browsers to communicate with Apache, the Apache configuration requires TLS version 1.1 or later. To use versions of Microsoft Internet Explorer 9 and 10, you must enable TLS 1.1 or later (in **Internet Options > Advanced**). For more information, see the following Green Circle article:

[The DROWN Attack: Configuring your Turbonomic Web Security](#)

Updating the Tomcat Server

There are circumstances when you might choose to upgrade the Tomcat server on Turbonomic to a later version. In this case you must copy a local configuration file to the tomcat installation.

After you update the Tomcat server:

- Copy the file `/usr/libexec/tomcat/server.local` to `/usr/libexec/tomcat/server`
- To ensure that this server configuration file is executable, perform the command: `chmod 755 /usr/libexec/tomcat/server`

Storage Requirements for the Turbonomic Server

Turbonomic now states 150GB or greater as a requirement for disk storage. For Turbonomic servers hosted on VMware hypervisors, you should provide 150GB *plus* swap space to match the RAM allocation.

Transport Layer Security Requirements

Starting with version 5.4, 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 suddenly fails to validate after installing Turbonomic 5.4 or later, this is probably 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.

Enabling HTTP and HTTPS Proxies

Turbonomic supports the use of HTTP and HTTPS proxies for internet communication. However, you must edit the Tomcat Server configuration file to add the required system variables.

The file you must edit is on your Turbonomic server at `/usr/libexec/tomcat/server`

In this file, search for the `OPTIONS` statement. It should appear in the config file similar to the following:

```
FLAGS="$( $JAVA_OPTS ) $CATALINA_OPTS "  
OPTIONS=" -Dcatalina.base=$CATALINA_BASE ..."
```

Add the following flags to the `OPTIONS` statement, giving values for your proxies:

```
-Dhttp.proxyHost  
-Dhttp.proxyPort  
-Dhttps.proxyHost  
-Dhttps.proxyPort  
-Dhttp.proxyUser  
-Dhttp.proxyPassword  
-Dhttps.proxyUser  
-Dhttps.propyPassword
```

The resulting OPTIONS statement should be similar to the following:

```
OPTIONS="-Dcatalina.base=${CATALINA_BASE} \  
-Dcatalina.home=${CATALINA_HOME} \  
-Dhttp.proxyHost=111.10.10.123 -Dhttp.proxyPort=123 \  
-Dhttps.proxyHost=112.10.10.123 -Dhttps.proxyPort=456 \  
-Dhttp.proxyUser=user -Dhttp.proxyPassword=password \  
-Dhttps.proxyUser=user -Dhttps.propyPassword=password"
```

Note that the values you provide for this file must match the values you provide when specifying a proxy in the Turbonomic user interface. After you make these changes, restart the Tomcat server.

For further assistance, contact Technical Support.

Enabling HTTP to HTTPS Redirects for the REST API

Starting with version 5.9.1, Turbonomic redirects http requests to the user interface and the REST API over to HTTPS. For the user interface to display, this redirect must be in place.

If you are updating from a version of Turbonomic that is earlier than 5.9.1, then you must restart the httpd service on the Turbonomic server. A restart enables this redirect after such an update.

To restart the httpd service, use the following command: `service httpd restart`

For more information, contact Technical Support.

Enabling IOPS and Network Monitoring for OpenStack Mitaka

The Target Configuration Guide gives instructions to connect to OpenStack targets. However, if you are running OpenStack Mitaka, you must perform additional configuration on the Mitaka platform to enable IOPS and Network data collection from Physical Machines. For those instructions, please see the Green Circle article, [Enabling OpenStack PM Metric Collection](#).

SMI-S Provider Versions for EMC VNX and EMC VMAX Storage Solutions

To connect to EMC VNX and VMAX disk arrays, Turbonomic uses EMC SMI-S providers that have the given disk arrays added to them. Note that VNX and VMAX support different versions of SMI-S Providers:

- VNX
For VNX and VNX2 arrays, use SMI-S version 4.6.2, based on Solutions Enabler 7.6.2. We have verified Turbonomic control of VNX block storage using SMI-S version 4.6.2 as a target.
- VMAX
For VMAX arrays, use SMI-S version 8.1, which is included in Solutions Enabler 8.1 – We have verified Turbonomic control of VMAX storage arrays using SMI-S version 8.1 as a target.

Known Issues

- In Azure environments, storage cost depends on the type of storage you have purchased. For unattached, unmanaged standard storage, the you are charged for utilized storage. However, Turbonomic calculates cost based on what storage has been allocated. As a result, calculated costs can be higher than actual costs. In reports this can show in two ways:
 - Current costs can be overstated
 - Potential savings for moves to other storage can be overstated
- For integrations with vRealize Automation environments, in some environments Turbonomic fails to properly identify the datacenter that houses a given host.
- After executing **Settings : Maintenance Options : Export Current Environment**, the user interface sometimes shows that the export failed even though the export is still running successfully. If you are exporting a large topology, the user interface response can time out and show this warning after 60 seconds, even though the export continues to run. If you experience this situation, restart the Turbonomic server. This restarts the HTTP server with a 10 minute timeout setting, which should be sufficient to export most environments. If the problem persists after a restart, contact technical support.
- When running a plan to replace a VM, remove the VM and add a template. Replacing the VM may ... (help draft)
- On rare occasions, the user interface for a plan can freeze while the plan successfully executes. If this occurs, navigate away from the specific plan, and then navigate back to the plan again.
- When setting up a custom plan, the user interface allows you to set a scope that includes public cloud entities. If you run such a custom plan, you can see unexpected or incorrect plan results. You should not set a scope that contains public cloud entities. To run plans for the public cloud, choose the **Migrate to Public Cloud** or the **Optimize Cloud** plan type.
- The user interface does not accept edits to existing automation policies. If you need to change a policy, delete it and create a new policy with the settings you want.
- Turbonomic can automate resize actions for datastores. However after executing the action, the hypervisor that is stitched to the datastore requires a refresh before it can recognize that change. Because Turbonomic uses the hypervisor to discover the datastore, then Turbonomic will not recognize the change either. As a result, Turbonomic might recommend the same action again, even though the datastore has already been resized. To avoid this situation, Turbonomic suggests that you set the Action Mode for storage resize actions to be **Recommend**.
- For CloudFoundry environments, the Turbonomic market can incorrectly identify the VM that hosts a container. This can happen when two or more cloud targets have VMs with the same internal IP address. For a container that is hosted on a VM with that address, Turbonomic cannot assure that it hosts the container on the correct VM.
- When you set up a Migrate Workload plan, you can choose the workloads to migrate from a list of VM GROUPS or a list of VM ENTITIES. When the user interface first shows the list of VM GROUPS, the list actually shows individual VMs, not VM groups. If you show VM ENTITIES and then show VM GROUPS again, the group list displays correctly.
- To avoid timeout issues when working with saved plans, you should only delete one saved plan at a time.
- **Customer Issue 98320**

In Turbonomic you can create policies with a scope to a dynamic group. If changes in your environment remove all the members of the group for that policy, Turbonomic deletes the policy definition.

- **Customer Issue 97962**

Automation policies for hosts include analysis settings for Desired State. The desired state settings affect Turbonomic analysis to give more emphasis to assuring performance or to increased utilization of infrastructure. You can specify Desired State globally in the Host default policy, or you can specify different Desired State settings for different scopes of hosts.

Turbonomic plans only use the global setting that you have in the Host default policy. The plans ignore scoped settings for Desired State.

- Turbonomic introduces a scaling constraint that you can use to exclude specific templates from move actions (VM, only) or resize actions (VMs and database instances on the cloud). For example, workload resizing in the cloud changes the template that defines the workload. To constrain resize actions for a scope of workloads, you can exclude certain templates for that scope.

In Azure environments, when you set policies to exclude templates for resize actions on Database Instances, the template exclusion initially fails. If this occurs, you can force Turbonomic to recalculate actions, and those actions will then recognize your template settings. To do this, change the action mode for an action in this policy, and apply that change. Then reset the action mode to its original value and apply it again.

- To ensure that Turbonomic recommends the most appropriate actions for AWS environments, you must make specific settings for default policies in your Turbonomic installation. After adding an AWS target, then perform these steps:
 - Click **Settings: Policies** to navigate to the Policy Management page.
 - Ensure datastore browsing is disabled for the Storage Defaults policy.
Find the Storage Defaults policy and make sure that the option for Disable Datastore Browsing is ON.
 - Make the following settings for the Virtual Machine Defaults policy:
 - * For **Action Automation**, set the following actions to **Manual**:
 - * Resize Up
 - * Resize Down
 - * Storage Move
 - * Start
 - * For **Resize Recommendation Incrementing Constants**, drag the Rate of Resize slider to **High**.
- When running plans to migrate workload to the cloud, be sure to choose the **Migrate to Cloud** option, and do not use the **Workload Migration** option. If you use **Workload Migration**, you can successfully set up a migration to the cloud, but the resulting plan might not choose the least expensive regions for workload placement.
- In AWS environments, Turbonomic discovers data from a given AMI to determine the OS of an associated VM. The OS influences cost calculations.
If you delete the AMI from your environment, then Turbonomic cannot discover the OS, and so it assumes a free Linux OS. This can result in incorrect calculations of cost in plans and in evaluations of real-time costs.
- If you deploy a Relational Database instance in AWS and then stop it, the Turbonomic user interface still shows that instance as active.
- After restarting the Turbonomic server, users must log into new sessions in order to continue using the user interface or the API.
- You cannot set up an Add Workload plan to add workloads based on public cloud templates. For example, you cannot choose to add 10 copies of an AWS template.
To set up an Add Workload plan, you should use Turbonomic templates that describe the allocations you want. Then to add workloads to the cloud, the plan can calculate which cloud template best suits that workload, depending on what templates are available for the given regions.
- To enable the best resize-down performance for VCPU on the cloud, you should set the global VCPU Resize Increment to 1 MHz.
- For Migrate to Cloud plans, when you migrate a VM that has an attached ISO image, the plan shows a move of a non-existent 0GB disk. This 0GB disk is a representation of the ISO image, and you can ignore the move action. The other plan actions for the VM are correct.

- To set up a Migrate to Cloud plan, you specify the scope of VMs that you want to migrate to the cloud. Currently, the plan configuration only supports a scope of one group or one VM. If you want to migrate workloads that are currently in different groups, then you can create a static or a dynamic group to include those workloads and migrate them to the cloud.
- Turbonomic supports logging in to AWS targets via AWS Identity and Access Management (IAM) with IAM Users or IAM Roles. To enable using Roles, you must run the Turbonomic software on an EC2 instance in the AWS cloud, and you must have the Turbonomic instance run as the IAM Role, and connect to the AWS target accounts with the appropriate IAM Role. To perform these actions, please contact Technical Support.
- Full management of storage on the public cloud includes identifying wasted storage. To enable this, create a policy for your cloud storage. Then under Storage Settings, add Disable Datastore Browsing and then turn it off. Turbonomic discovers groups of storage by cloud provider or cloud region, to make it easy for you to create this policy. Set these groups to be the policy scope.
- For Tomcat, SQLServer, WebSphere, and other application or database targets that use a scope to identify target instances, Turbonomic can fail to validate or discover the targets. If you add a target via scope, and that scope does not have any VMs to host the target applications, then the target will not validate. If you later add hosts for the applications to that scope, Turbonomic does not dynamically recognize the change and then validate and discover. Even if you execute a Validate command for that target, Turbonomic can validate but it will not run discovery.

To avoid this problem, make sure your applications are running on hosts before you configure the target. If you have encountered this problem (you added hosts to a scope after configuring the target), delete the target from Turbonomic and set a new target with this scope.
- Customers upgrading from 5.7 or 5.8 versions of Turbonomic might need to reset their custom policies for disk arrays.

Starting with version 6.0, Turbonomic changes the way it creates groups categorized as Storage by Disk Array. In earlier versions, these groups included placeholder disk arrays (arrays that are not discovered through a disk array target). Turbonomic no longer includes these disk arrays in the Storage by Disk Array category of groups. If you have upgraded from 5.7 or 5.8, and you used any Storage by Disk Array groups to set Turbonomic policy overrides to your disk arrays, then you will lose these settings as a result of this change to groups. You must reset these policy settings to your disk array groups in the upgraded version of Turbonomic.
- Y Make the point that collisions for Workflow vs TBN action execution are non-determinate... User must be careful.
- Assume you have application or database servers as targets, and they use dynamic groups to define their scopes for monitoring. If you add new application or database servers to these dynamic groups, or if you shut down and then restart an existing server, then Turbonomic fails to discover the change and these servers will not appear in the UI. To resolve this problem, execute a manual rediscovery of the affected target.
- On rare occasions the user interface for adding a target displays a blank page. If that occurs, refresh the browser to display the Add Target controls.
- For WebSphere, Tomcat, and SQLServer targets, you can set a scaling policy to be horizontal or vertical. To set scaling for these targets, you must set it both in the Turbonomic user interface, and also in the properties file for the given probe. This means that for any of these targets, all discovered entities must use the same scaling property. For help with scaling policies for these targets, contact Technical Support.
- Under some circumstances when using the Deploy View, the user interface can fail to respond. After you request a placement, if the placement recommendation does not appear within one to two minutes, reload the browser running Turbonomic to reset the user interface.
- If you ignore hyperthreading for a scope that is less than a datacenter and then restart tomcat for the Turbonomic application, then Turbonomic does not calculate the CPU capacity correctly for the affected scope of hosts. If this problem occurs, perform a full rediscovery to show correct CPU capacity.

- When you reserve resources for VMs that you will deploy in the future, Turbonomic initially calculates these reserved resources as CPU Provisioned, Memory Provisioned, and Storage Provisioned. However, these resources ultimately revert back to values that do not include the reserved VMs.
- There is a rare case where Turbonomic can lose the cluster relationship for VMs running on a host. Assume you move a host out of a cluster, and directly into the datacenter (not into a cluster). Next you create a new cluster and then move the host into that cluster. In this case, the VMs on that host will not belong to any PM cluster. This can also affect Provider Virtual Datacenters that belong to the new cluster.
To avoid this problem, create the cluster first, and move the host directly into it. If this problem occurs, rediscover your environment to establish the correct cluster relationships.
- For VMs running on Hyper-V, if you set a VCPU limit (limit VCPU to less than 100%), then the VCPU utilization data that VM returns to Turbonomic is not correct. As a result, Turbonomic will not recommend that you increase the VCPU limit.
- For Hyper-V and VMM targets, secure connections use port 5986 and unsecure connections use 5985. As you enable or disable a secure connection, the user interface does not automatically set the correct port number. You must be sure to specify the correct port for the type of connection you want.
- In OpenStack environments, it is possible to place a VM belonging to a specific cluster (a VM flavor that is set via extra specifications) onto a host that is not a member of that cluster. Turbonomic cannot identify this configuration error, and will not recommend a move to place the VM on an appropriate host.
You can implement placement policies to ensure that VMs always get placed on the correct hosts. This can work even if there is no host cluster to match the VM flavor. However, in that case the user interface will not show these VMs as members of a PM cluster.
- In the JSON REST API, you can execute a DELETE method for Market and Market_default. The API should prohibit DELETE methods for these resources. If you are programming with the API, do not execute a DELETE on these market resources.

Fixed Issues

- **Fixed:** Because some required security settings for SELinux are not properly configured on the Turbonomic instance, Turbonomic does not properly connect to some SMI-S storage providers.
- **Fixed:** Under some circumstances, when a schedule attempts to change the action settings for a scope, Turbonomic displays an error and does not make the change. It's possible that the user interface will show the change, but the change does not take effect during the schedule window.
- **Fixed:** Under some circumstances, Turbonomic VCPU and VMEM resize recommendations do not show complete data. For example, the "From" field is blank. In some circumstances, executing such an action fails to complete.
- **Fixed:** For license placement policies, there are circumstances where after a licensed workload has been moved to an un-licensed host, the policy does not generate a compliance issue to move the workload back to a licensed host.
- **Fixed:** In Azure environments, under some circumstances discovery can fail.
- **Customer Issue 99711**
Fixed: Under some circumstances discovery fails in Azure environments.
- **Fixed:** In Netapp environments with backup storage, if the storage is not attached to workloads then under some circumstances Turbonomic fails to discover the datastores.
- **Fixed:** In Hyper-V environments with host clusters and with stand-alone hosts, under some circumstances Turbonomic recommends moves to invalid hosts, and the move actions fail.
- **Fixed:** In vary large environments, performance is poor for the user interface when editing cloud budgets.

- **Customer Issue 99421**

Fixed: When creating a group, you can search the list of entities to choose group members. The user interface does not support accumulating selections that you make from successive searches. As you change to a new search, the user interface clears the selection you made from the previous search.