Turbonomic 6.0.5 Release Notes

January 23, 2018

This document describes issues that are addressed in Turbonomic 6.0.5 – Release Date: January 23, 2018. All builds are cumulative. Applying 6.0.5 onto any release of Turbonomic 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 6.0.5 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

- Under some circumstances in environments with multiple AWS targets, discovery of wasted storage can result in inconsistent lists of unattached EBS volumes.
- Turbonomic generates special average or max utilization templates that it uses when calculating cluster headroom. You should not edit these templates, because Turbonomic will overwrite your changes the next time it generates the templates. However, the Template Catalog presents these templates as editable.
- As you set up a plan, the Results panel shows how many entities are in the plan scope. When you set up a scoped plan, the panel incorrectly shows entity counts for the global scope.
- Under some circumstances in a NetApp environment, execution of a storage move action will fail.
- In a Hyper-V environment, you can set up individual hosts as stand-alone targets and you can set up VMM targets to manage clusters of hosts. Also, you can set up a stand-alone target that is a member of a cluster managed by the VMM. If Turbonomic recommends a move within a cluster where the move is between a VM from a stand-alone target and a host managed by VMM, then executing that move will fail.
- 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.
- After running a plan, if the plan recommends suspending hosts, then the list of actions does not include all of the Deactivate Host actions that are necessary to arrive at the plan results.
- You should never use duplicate names for groups of the same entity type. However, the user interface does not validate group names to keep you from creating a duplicate name.
- 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.
- 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.
- Under some circumstances, the user interface can show an AWS Relational Database using resources from a Host entity, and it can recommend actions to move Relational Databases to hosts. In the cloud environment, the database should use resources from a VM. If you see these symptoms, please contact Technical Support.
- 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.
- For this release, **Add Workload to Cloud** plans do not work properly. They cannot place the new workload on the cloud.
- 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.

- Under some circumstances, for Migrate to Cloud plans that migrate to multiple public cloud accounts, the plan results can show more VMs than you chose to migrate. However, the plan costs and actions are correct for the number of VMs you migrated.
- For a Migrate Workload plan, the plan scope must include both the workloads you want to migrate, and also the providers that you want to migrate the workloads to. If you do not set the scope in this way, then the plan might not show any migration results.
- 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 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.
- Turbonomic automatically creates some groups of on-prem VMs that do not work in Migrate to Cloud plans. If you use these groups, the migration plan will not complete. Specifically, Turbonomic creates VM groups for each target. These group names begin with the prefix `VMs_VMTTarget_`. Do not use these groups as the source of workloads to migrate to the cloud in a migration plan.
- You should not create scheduled policies for one-time occurrence (RECURRENCE is set to Does Not Recur). If you create such a policy and save it, then you cannot edit the policy later.
- 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.
- Under some circumstances, Turbonomic can recommend actions with a category of UNDEFINED. However, when you filter the list of actions, UNDEFINED is not a category that you can choose.
- 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.

- 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.
- If Turbonomic discovers a WebLogic target, and then the WebLogic and Turbonomic instance are both shut down, then Turbonomic will not rediscover the WebLogic target after it restarts. To correct this issue, execute a rediscovery of the WebLogic 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.
- 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.
- 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:** Under some circumstances, restarting the Turbonomic server requires you to reapply your license.
- **Fixed:** Admin users with special characters in their passwords cannot log into the `update.html` page to perform an offline update.
- **Fixed:** Under rare circumstances the supply chain fails to load specific entities, and the Turbonomic instance becomes unresponsive.

- **Fixed:** When Turbonomic discovers unconnected switches in your environment, discovery fails.
- **Fixed:** Under some circumstances in XenServer environments, Turbonomic fails to fully discover the XenServer VMs.
- **Fixed:** In NetApp environments, under some circumstances with multiple NetApp targets, Turbonomic can fail to discover all the storage entities.
- **Customer Issue 98711**
  Fixed: In HP 3PAR environments that use Common Provisioning Groups that are set to grow by a given increment, Turbonomic can incorrectly recommend provisioning a additional storage.
- **Customer Issue 97886**
  Fixed: Under some circumstances, resize actions for VMs in vCloud Director environments that are automated in Turbonomic can fail to execute.
- **Customer Issue 98552**
  Fixed: Under some circumstances in UCS environments that also use vCenter Server to manage the blade hosts, Turbonomic can incorrectly increase the count of hosts and sockets in your environment.
- **Customer Issue 98362**
  Fixed: In Hyper-V environments, under rare circumstances Turbonomic recommends or executes an inappropriate VM move action.
- **Customer Issue 98357**
  Fixed: In the legacy user interface, you can view wasted files. However, after you exclude specific directories from datastore browsing, the wasted files listing does not update to exclude the files from those directories.
- **Customer Issue 97894**
  Fixed: In Hyper-V and VMM environments, in some circumstances where Turbonomic could not discover specific hypervisors both through VMM and through a Hyper-V target then Turbonomic posted a notification to `Check Hypervisor for HyperV Hosts`.
- **Customer Issue 98334**
  Fixed: Under rare circumstances for VNX environments, discovery does not populate the complete supply chain for a VNX disk array.
- **Customer Issue 98114**
  Fixed: Turbonomic fails to validate UCS targets via service accounts that use Active Directory credentials.
- **Customer Issue 98038**
  Fixed: The Turbonomic audit log sometimes shows repeated move actions for the same VM, even though the first move action succeeded.
- **Fixed:** Under some circumstances the final processing of discovered entities takes an excess amount of time. This impacts performance of the Turbonomic instance.
- **Fixed:** When you deploy Turbonomic to AWS and configure a proxy for that instance, then the instance cannot reach AWS targets to validate the connection or perform monitoring and control.
- **Fixed:** Under some circumstances, Migrate to Cloud plans that include Azure targets do not include region information for workloads that the plan migrates to Azure clouds.
- **Customer Issue 98610**
  Fixed: Cost breakdown charts for public cloud accounts take too long to load their data.
- **Customer Issue 98345**
  Fixed: Under some circumstances, performance is unacceptably poor when loading a saved plan or executing a plan.

- **Customer Issue 98558**
  Fixed: In AWS environments, under some circumstances the user interface displays the wrong template data for a VM workload.
- **Fixed:** After running a migration plan, the plan data is removed from the Turbonomic list of executed plans.
- **Customer Issue 98763**
  Fixed: While Turbonomic maintains the legacy user interface along with the new HTML user interface, it's possible that settings you make in the new user interface will overwrite the settings you had previously made in the legacy user interface. When you restart the Turbonomic server (or restart tomcat on the server), the settings in the new user interface take precedence.
- **Fixed:** Under some circumstances, after you run a plan then the Turbonomic instance can fail to retain the plan data. For example, assume you run a plan, log out of Turbonomic, and then log in a day later. If you display the plan again, then the user interface might not display all of the plan's data.
- **Customer Issue 98071**
  Fixed: When working with scoped reports, the user interface does not clear a set scope if you navigate to a different report.
- **Fixed:** When plans calculate costs for migration to the cloud, Turbonomic should use the standard number of hours per month that is used by other cloud tools.