



Turbonomic Actions 1.1 for ServiceNow®

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Introducing Turbonomic Actions

Turbonomic Actions is an integration that brings the power of Turbonomic to your ServiceNow® Change Management application. You can use Turbonomic Actions to track the actions that Turbonomic recommends, or to create new Change Requests (CRs) in your ServiceNow instance.

Note that Turbonomic constantly analyzes your application environment. For the Configuration Items (CIs) that you specify, Turbonomic can recommend actions to:

- Assure application performance
Prevent bottlenecks, provision physical resources, upsize VMs, and prioritize workload to ensure applications always have the resources they need.
- Ensure efficient use of resources
Consolidate workload, downsize VMs, prevent VM sprawl, and take advantage of pricing plans on the cloud.
- Ensure compliance
Keep workload placement and resource allocation compliant with your business rules.

Turbonomic Actions integrates your ServiceNow account with Turbonomic to:

- Record changes in your environment
Before and after Turbonomic executes a change in your environment, Turbonomic Actions can log it as an Action Record.
- Open Change Requests (CRs) when a change is needed
For a Turbonomic action that is configured to integrate with your ServiceNow account, Turbonomic Actions opens a CR in your Change Management workflow. You then process that CR through normal channels to get the proper approval. When the change is approved, Turbonomic Actions then directs Turbonomic to execute the change. Turbonomic Actions then logs the change as an Action Record in ServiceNow.

To use this integration of Turbonomic with ServiceNow, a user with an administrator role installs the *Turbonomic Actions* application in your ServiceNow Cloud instance. Then a Turbonomic administrator configures the connection between Turbonomic and your ServiceNow Cloud instance.

The Turbonomic product analyzes your environment and generates actions that will keep your environment healthy. It sends the actions to Turbonomic Actions, which enters them into ServiceNow as Change Requests (CR) or Action Records. When a CR is approved according to your workflow, Turbonomic executes the change and returns the result.

This document describes the Turbonomic Actions application in the following sections:

- [Installing the Turbonomic Actions Application \(on page 7\)](#)
- [Turbonomic Actions Configuration \(on page 10\)](#)
- [Using the Turbonomic Actions Application for ServiceNow \(on page 21\)](#)

Turbonomic Actions Processing

Turbonomic Actions creates a new Change Request (CR) in ServiceNow when Turbonomic generates an action on a Configuration Item (CI) that you manage in ServiceNow.

Remember that Turbonomic is a platform you can use to keep your applications running and healthy, with access to the resources they need. It measures access to resources in terms of *Risk Index*. The higher this index for a resource, the more heavily the resource is utilized, the greater the delay for consumers of that resource, and the greater the risk to the QoS of your applications. On the other hand, if the index is too low, it indicates that the resources are underutilized. This could be an opportunity to save on cost by consolidating more workloads on fewer hosts.

When changes to the Risk Index indicate your environment is moving out of a healthy state, Turbonomic generates actions to address the issues before they become a problem.

Turbonomic Actions integrates this analysis with your ServiceNow workflows. It turns an action in Turbonomic into a CR in ServiceNow. When you approve the given CR, this integration directs Turbonomic to execute the action at the appropriate time. You can also set up the workflow to have Turbonomic execute the action and return the results.

The processing flow for a generated CR is as follows:

1. Turbonomic generates an action.

The Turbonomic product analyzes your environment to track the availability of resources that your applications need to maintain their QoS. When Turbonomic recognizes an issue, it generates an action to correct the issue.

2. Turbonomic sends the action to Turbonomic Actions in ServiceNow.

An administrator configures Turbonomic so that it knows which entities you are managing in ServiceNow. If an action is recommended for one of those entities, it sends the action to Turbonomic Actions.

3. Turbonomic Actions creates a Change Request (CR).

When it receives an action, Turbonomic Actions opens a new CR in the appropriate ServiceNow workflow.

4. Your enterprise reviews and approves or rejects the CR.

After approving the CR, it goes into the `Scheduled` state.

If you reject the CR, it goes into the `Cancelled` state.

NOTE:

The CR model must include a transition to the `Scheduled` state. Turbonomic Actions uses this state as a trigger to pass that action over to Turbonomic for execution.

5. Turbonomic Actions passes the CR state back to Turbonomic.

If the CR has been approved (has moved into the `Scheduled` state), Turbonomic executes the action. If you have configured this action to have a maintenance window in Turbonomic, it waits until the scheduled time to execute the action.

If the CR has been rejected (has moved into the `Cancelled` state), Turbonomic removes the action from its list of pending actions.

6. Turbonomic Actions logs the CR result.

Turbonomic returns the action status back to Turbonomic Actions.

For an approved CR, Turbonomic returns the result of action execution. The result can be:

- Succeeded – Turbonomic executed the action successfully.
- Failed – Turbonomic tried to execute the action but it failed for some reason. For example, network issues could keep Turbonomic from executing the action.
- Missed – If the change is no longer valid, Turbonomic will not execute the action. For example, assume a change to add memory to a VM. If the application no longer needs that extra memory, Turbonomic will not execute the action even though you have approved it.

For all of these action results, Turbonomic removes the given action from its list of pending actions.

For the given CR, Turbonomic Actions closes the CR and logs the result in an ServiceNow. For a failed or a missed action, Turbonomic will not try to execute the same CR again. If the same conditions arise again, that can cause Turbonomic to generate a new instance of that action. The new action begins this process flow from the top.

7. Your enterprise reviews the action status and completes the workflow.



Installing the Turbonomic Actions Application

The Turbonomic Actions application integrates Turbonomic with ServiceNow change management. This integration brings Intelligent Workload Management via Turbonomic into orchestration workflows for ServiceNow users.

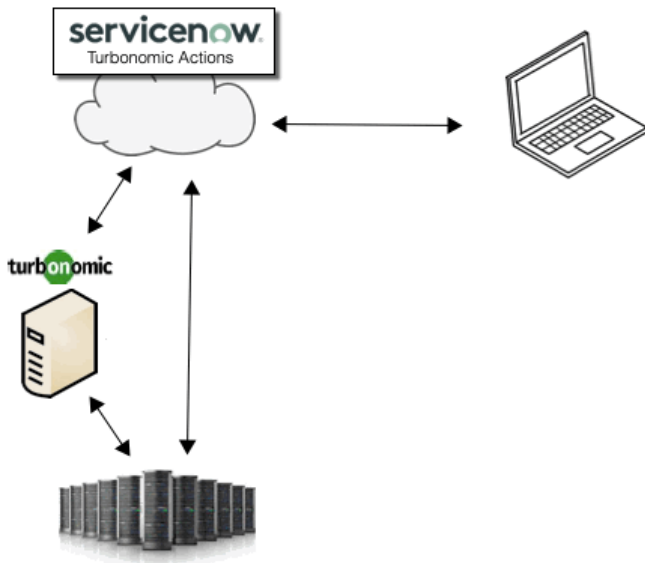
To automate the discovery and execution of changes via the Turbonomic Actions application, you must have configured:

- A valid ServiceNow account
- The Turbonomic Actions application installed in your ServiceNow account
- One or more deployed instances of Turbonomic

This instance must be configured to manage the same datacenter entities that you manage as Configuration Items (CIs) by your ServiceNow account. Also, the instance must have your ServiceNow account configured as a target, so it can communicate with that account.

One installation of Turbonomic supports only one ServiceNow target. To integrate multiple ServiceNow accounts with Turbonomic Actions, deploy a unique instance of Turbonomic for each ServiceNow target you want to support. For more information, please contact Turbonomic Technical Support.

These components interact with each other to integrate Intelligent Workload Management with your orchestration workflows.



This documentation assumes that you have a valid ServiceNow account, and that you have a deployed instance of Turbonomic. After you have installed Turbonomic Actions, you can then go to your deployed instance of Turbonomic to configure your ServiceNow account as a target. For information about configuring the target, please see the Turbonomic Target Configuration Guide.

Installing Turbonomic Actions on ServiceNow

NOTE:

To install the Turbonomic Actions application, your ServiceNow account must have an `admin` role. For general information about downloading applications from the ServiceNow Store, see [Download an application from the ServiceNow Store for the first time](#)

To install the Turbonomic Actions application:

1. Navigate to the ServiceNow Store, and go to the Certified Apps tab.
From the Certified Apps tab, search for Turbonomic Actions. Navigate to the Turbonomic Actions page, and **GET** the application. You will need your ServiceNow HI credentials.
Accept all notices and licenses.
2. Choose the entitlement for the Turbonomic Actions application.
This sets which ServiceNow instances can use the application. You can choose to make it available on all instances. But you should be aware that the Turbonomic platform only supports a single ServiceNow target per platform instance.
3. Select the ServiceNow instances to install the application on.
When you do this, you will receive a purchase confirmation, and the ServiceNow Store sends an email to the account associated with your ServiceNow instance.
4. Follow the installation instructions in the ServiceNow Store email that you receive.
This should install the application in your ServiceNow instance. To verify that the application is installed, navigate to the Turbonomic Actions user interface. Enter `Turbonomic` in the ServiceNow Navigator search bar. This should display the Turbonomic Actions menu.

After you have installed the application, configure it for use with your deployment of the Turbonomic platform. See [Turbonomic Actions Configuration \(on page 10\)](#).

Be sure to check that the GUI views display correctly, and that the forms behave as intended. To guide your review of the GUI, click **Help** to open the user documentation. If you encounter problems with the rendering or behavior of the GUI, contact Turbonomic Technical Support.



Turbonomic Actions Configuration

To successfully use Turbonomic Actions, you must configure:

- Settings for the Turbonomic Actions application
- Turbonomic policies
- Turbonomic targets

These configuration tasks ensure that Turbonomic Actions interacts correctly with both ServiceNow and Turbonomic. The Turbonomic policies specify how to manage your ServiceNow configuration items in league with the Turbonomic Actions application.

You should be sure to review the [Product Specifications and Release Notes \(on page 17\)](#).

Configuring Settings for Turbonomic Actions

When you install Turbonomic Actions, it includes default settings that it can use to work with your Change Management application. In most cases, these default settings will be appropriate.

To see these settings, click *Settings* in the Turbonomic Actions menu. The Settings page displays the settings that are current for your installation. If you have privileges, you can edit these settings to customize how Turbonomic Actions works with your installation.

You can view and edit the configuration to:

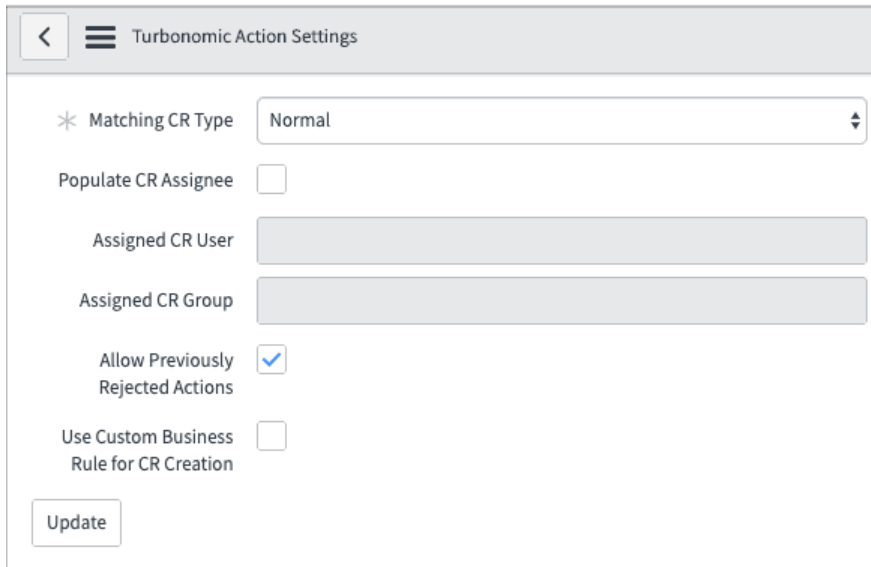
- Change Request handling (see [CR Settings \(on page 10\)](#))
- Change Item Matching Details (see [CI Matching Details for Virtual Machines \(on page 12\)](#))
- Correct Errors with Cross-Application Scope (see [Managing Cross-Application Scope \(on page 13\)](#))

CR Settings

The CR Settings guide how Turbonomic Actions creates a Change Request (CR).

To edit the settings:

1. Click *Settings* in the Turbonomic Actions menu.
This displays the Turbonomic Actions Settings view. This view includes the record that shows your current CR settings.
2. Click the field entry for Matching CR Type.
This opens the Settings record so you can edit its values.



You can make the following settings for Turbonomic Actions:

- **Matching CR Type**
The CR type to generate for Turbonomic actions. The Change Management application includes three CR types, each with different behaviors. Use this field to choose which type you want to generate when using Turbonomic Actions. Can be one of:
 - Normal (Default)
 - Emergency
 - Standard

For more information about CR types, see your ServiceNow documentation.

NOTE:

You can edit your CRs in ServiceNow. In all cases, the CR that you use with Turbonomic Actions must include a `Scheduled` state. When Turbonomic Actions recognizes that the CR is in this state, it sends the action to be executed by Turbonomic.

- **Populate CR Assignee**
When you turn this on, you can then specify the CR users or groups to specify for each generated CR. Click the SEARCH icon to search for valid user and group names.
- **Apply Previously Rejected Actions**
If your enterprise has rejected a CR for a specific action and Turbonomic recommends that action again, you can choose to ignore it, or choose to consider it again. This setting has a global effect. If you turn it off, then Turbonomic Actions will not create new CRs for any actions that you subsequently reject.
- **Use Custom Business Rule for CR Creation**

Turn this on to use custom rules when Turbonomic Actions generates a CR. When you turn this on, Turbonomic Actions will not create CRs. Your ServiceNow administrator must deploy a custom business rule that will generate the CR.

The business rule is defined for the Turbonomic Action Approval event (`x_turbo_turbonomic_turbonomic_action_approval`, on insert).

Implement the rule to trigger for each `insert` into the approval table that Turbonomic Actions maintains. You should also implement the global `UpdateApprovalBasedOnRequestStateChanges` business rule to update the approval record when the given CR has been approved.

After you make your settings, be sure to click **Update**.

CI Matching Details for Virtual Machines

The CI Matching Details list the tables that store discovered VM data, and which column in the table to use.

CI Matching Details for Virtual Machines

Aws VM Table Name	<input type="text" value="Virtual Machine Instance [cmdb..."/>	Aws VM Table Column	<input type="text" value="object_id"/>
Azure VM Table Name	<input type="text" value="Virtual Machine Instance [cmdb..."/>	Azure VM Table Column	<input type="text" value="vm_inst_id"/>
Hyper-V VM Table Name	<input type="text" value="Hyper-V Virtual Machine Instanc..."/>	Hyper-V VM Table Column	<input type="text" value="object_id"/>
vCenter VM Table Name	<input type="text" value="VMware Virtual Machine Instanc..."/>	vCenter VM Table Column	<input type="text" value="object_id"/>

By default, Turbonomic Actions assumes that you have configured ServiceNow to use its Discovery plugin to discover VMs on AWS, Azure, Hyper-V, and vCenter Server environments. The default matching detail entries are:

Entity Type	Table Name:	Column Name:
Aws VM	Virtual Machine Instance [cmdb_ci_vm_instance]	object_id
Azure VM	Virtual Machine Instance [cmdb_ci_vm_instance]	vm_inst_id
Hyper-V VM	Hyper-V Virtual Machine Instance [cmdb_ci_hyper_v_instance]	object_id
vCenter VM	VMware Virtual Machine Instance [cmdb_ci_vmware_instance]	object_id

If you have deployed a different system to discover VMs in your environment, then you can modify the matching details to specify the appropriate tables and columns for each VM type.

After you make your changes, be sure to click **Update**.

Managing Cross-Application Scope

To enable communication between applications in ServiceNow, the administrator must explicitly enable that communication pathway. You enable this communication by declaring Cross-Application Scope, which defines:

- **Source Scope:** The application that requests the communication pathway.
- **Target Scope:** The scope of the requested communication. For example, `Global` or `Change Mgmt`.
- **Target Name:** The table that the Source wants to access.
- **Operation:** The kind of access the Source requests. For example, `Read`, `Write`, or `Create`.
- **Status:** Whether the cross-application scope is allowed or not. For example, `Allowed` or `Requested`.

By default, when you install Turbonomic Actions, it defines scoped permission for a number of tables. This enables communication in the most common cases. In particular, the installation enables `Global Read` for the CI Matching tables. (For information about CI Matching tables, see [CI Matching Details for Virtual Machines \(on page 12\)](#).)

For example, assume the CI Matching table, `cmdb_ci_vm_instance`. The default installation defines:

- **Source Scope:** `Turbonomic Actions`
- **Target Scope:** `Global`
- **Target Name:** `cmdb_ci_vm_instance`
- **Operation:** `Read`
- **Status:** `Allowed`

If you have changed scope definitions, or if you changed the CI Matching to use different tables, then you must be sure the cross-application scope has been defined to support your changes. If the scopes are not properly defined, ServiceNow can post errors as a CR makes its state transitions.

Some common causes of this problem include:

- You changed the CI Matching table to use for a given class of VMs.
For example, you might change the CI Matching Table for AWS VMs from `cmdb_ci_vm_instance` to `cmdb_ci_server`. The scope record for this table might not be set to `Global`, or the record might not exist at all.
- You added a scope record for a table that Turbonomic Actions already uses.
For example, you added a scope record for `change_request`, and gave it a scope of `Change Mgmt` (instead of `Global`). ServiceNow will use the more conservative setting from the record you added, and so CR transitions for Turbonomic Actions will throw an error.
- You changed the definition for an existing target.
For example, you changed the Status for `change_request.read` from `Allowed` to a lower setting.

Assume you changed the Status for `change_request.read` to something other than `Allowed`. In that case, you might see an error similar to:

```
ScopeAccessNotGrantedException: read access to change_request not granted
```

The error message identifies the operation that fails (`read`), and the target name (`change_request`). This information tells you which scope record you need to change.

To find the record, navigate in ServiceNow to *System Applications / Application Cross-Scope Access*. This displays the *Cross scope privileges* screen. Look for an existing record with:

- Source Scope = Turbonomic Actions
- Target Scope = Global
- Target Name = change_request
- Operation = Read
- Status = Some value other than Allowed

To fix the issue, change the Status to Allowed.

If you cannot find the appropriate record, then you must create a new one. In *Cross scope privileges*, click *New*, and create the new record with the appropriate values.

Setting Turbonomic Policies

To use Turbonomic Actions with your ServiceNow Change Management application, you must have an instance of the Turbonomic product deployed to manage the entities in your environment. In addition, Turbonomic must be configured with your ServiceNow account as a target, and it must have automation policies defined for the entities that you have configured ServiceNow to manage.

This section describes the Turbonomic policies that identify the scope of entities to manage via Turbonomic Actions, as well as how their actions will interact with ServiceNow and Turbonomic Actions. Your Turbonomic administrator should have already set up the necessary policies. However, an understanding of these policies will help you as you work with Turbonomic Actions and the CRs that it generates.

About Turbonomic Policies

As Turbonomic gathers metrics, it compares the metric values against specified constraint and capacity settings to determine whether a metric exhibits a problem, and what actions to recommend or execute to avoid a problem. Turbonomic uses Automation Policies to guide its analysis and resulting actions. These policies can specify:

- Action Automation
Whether to execute automatically or manually, or whether to just recommend the action.
- Action Orchestration
Whether to have Turbonomic execute the action, have Turbonomic direct an orchestrator to execute the action, or execute the action with Action Scripts.
- Analysis Settings
Settings that affect the Turbonomic analysis of the state of your environment. These include:
 - Operational Constraints such as enabling/disabling discovery of HA policies set for Hosts
 - Utilization Constraints such as memory or CPU utilization
 - Resize Increments
 - Application Priority

In addition, Turbonomic can include scoped Action Policies, which override the default settings for certain entities. With these policies you specify one or more groups of entities as the policy scope. You can also set a schedule to the policy to specify maintenance windows, or to support orchestration workflows that require approval before executing the given action.

The settings that directly affect Turbonomic Actions are the *Action Orchestration* settings. Your Turbonomic administrator will create scoped policies that affect the entities you want (the ServiceNow CIs). In addition, these policies will indicate whether to generate a CR for a given action, or whether to log the action in the Turbonomic Actions Records view.

NOTE:

Creation, edits, and deletes of Turbonomic policies that include ServiceNow Orchestration can see a lag of time before they take effect. This is because Turbonomic must propagate the policy settings throughout your environment. For a large environment, this lag can be significant.

This lag can impact behavior when you delete a ServiceNow Orchestration policy for a given scope of your environment. If an action has been approved in ServiceNow before the policy deletion has propagated fully, then Turbonomic can still execute that action. Once propagation is complete, Turbonomic will respect the new policy settings.

Before you create, edit, or delete ServiceNow Orchestration policies in Turbonomic, you should plan for the possibility of this time lag.

Special Considerations for Turbonomic Policies

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.

Specifying Automation and Orchestration

As your Turbonomic administrator creates a policy, she specifies the entity type and the scope of entities the policy affects. Then the administrator adds given action types to the **AUTOMATION AND ORCHESTRATION** section of the policy, and specifies how to execute the action, in the following steps:

1. Set the scope of the policy.

The policy scope is usually a group of entities. For example, you can create a group of all the Hyper-V VMs that you manage in ServiceNow. If you set the policy scope to that group, then the policy will affect those VMs. In this way, you can manage different sets of entities in different ways.

2. Direct Turbonomic to generate the actions.

For ACTION GENERATION, choose **Generate Actions**.

3. Add an Action Orchestration entry to the policy.

For ACTION ACCEPTANCE, choose one of the two ServiceNow orchestration options:

- Generate Action then Send Record to ServiceNow

Turbonomic registers the action in the ServiceNow log, showing that the given action has been recommended.

- Generate Action then Request Approval from ServiceNow

When you specify this setting, Turbonomic passes control for this action to your ServiceNow workflow as a Change Request (CR). When the CR is approved, Turbonomic executes the action with its default action processing. If the policy includes a schedule, it executes the action at the scheduled time. Otherwise it executes the action immediately.

Note that with this setting, Turbonomic registers the given action with your ServiceNow instance.

4. Optionally, specify an Action Execution Schedule.

You can specify a schedule for when Turbonomic can execute the action. This schedule should mirror your maintenance windows that you have decided on for your change request management.

For an approved CR that is tied to an Execution Schedule, Turbonomic waits until the scheduled time to execute the action. If the action execution has no schedule, then Turbonomic executes it as soon as the CR is approved.

Be aware that Turbonomic recommends an action at the time that the conditions warrant it. If you have scheduled action execution for a later time, then conditions could change enough that the action is no longer valid. If this happens, and the action remains invalid for 24 hours, then Turbonomic removes it from the list of pending actions. This action will not be executed. If the action generated a CR, the corresponding Action Approval will appear with a state of `MISSED`.

NOTE:

For an action approval that is marked as `MISSED`, Turbonomic Actions does not change the CR from that state. It is up to your organization to move such a CR into a different state. For example, you can implement a business rule to find all `MISSED` action approvals and mark them as appropriate.

Turbonomic policies include Scaling Constraints that work to stabilize action decisions for VMs. The resulting actions are more likely to remain valid up until their scheduled window for execution.

Policy Schedules

You can set a schedule for an automation policy, which sets a window of time when the policy takes effect. For example, you can specify that any actions Turbonomic generates from Monday through Friday will be sent to ServiceNow. Then you can create another policy for Saturday and Sunday that directs Turbonomic to immediately execute any actions it generates on the weekend, without posting them to the ServiceNow change management system.

Note that a policy schedule sets the window when the given policy takes effect. Do not confuse it with the Action Execution Schedule, which sets when Turbonomic can execute an approved action.

Setting the ServiceNow Target in Turbonomic

To use Turbonomic Actions with your Change Management application, you must have an installation of Turbonomic that manages the same entities that you monitor with ServiceNow.

To connect to your Change Management application, the Turbonomic administrator configures a ServiceNow target. This target uses a valid user account to log into your ServiceNow account, and communicate with your Turbonomic Actions application.

Target Prerequisites

The ServiceNow user account that the target logs in through must have the `x_turbo_turbonomic.user` role assigned to it. This role assigns the privileges that the target needs as it communicates with ServiceNow.

Installation of Turbonomic Actions creates this role on your ServiceNow deployment. It is a special role for setting up the ServiceNow target, and it assigns permissions to:

- Access the Turbonomic Actions application
- Add, edit, and delete records in the Turbonomic Actions data

Target Limitations

Target configurations must comply with the following points:

- A single installation of Turbonomic can support one ServiceNow target. If you want to run Turbonomic Actions more than one ServiceNow account, then you can set up a different installation of Turbonomic for each ServiceNow account.
- You can configure multiple instances of the 7.22 family of Turbonomic to communicate with the same ServiceNow target. However, you must ensure that each instance of Turbonomic manages completely different environments. If both instances of Turbonomic manage the same entity, then they could generate different actions for the same entity. This can give unpredictable results.
- If you configure multiple instances of Turbonomic to communicate with the same ServiceNow target, they must all be from the 7.22 version family. If you combine a 7.22,x version with a 6.4.x version, this can give unpredictable results.

Product Specifications and Release Notes

Turbonomic Actions Product Specifications

- Browser Compatibility

Turbonomic Actions operates with most commonly-used Web browsers (for example, Internet Explorer, Mozilla Firefox, Google Chrome, and Apple Safari).

Turbonomic Actions is designed for use as a desktop application. It is not designed for use on mobile devices.

- Internationalization

The Turbonomic Actions user interfaces is implemented in US English only.

Version 1.1

- Certified for ServiceNow versions:
 - New York
 - Orlando
 - Paris



Turbonomic Actions Maintenance

Setting the Log Level for Turbonomic Actions

Turbonomic Actions runs in your Service Now environment as a *scoped application*. To help with maintenance and tracking, Service Now manages logging for scoped applications. You can adjust logging level for scoped applications, including for Turbonomic Actions.

To adjust logging level for Turbonomic Actions:

1. Display the `sys_properties` table.
For example, you can execute a quick search for `sys_properties.list`
2. Find the log level entry for Turbonomic Actions.
Look for the entry `x_turbo_turbonomic.logging.verbosity`.
3. Set the logging level for this entry.

The log level can be one of:

- `warn`
- `info`
- `debug`
- `error`

Maintenance for Import Set Tables

As you work with Turbonomic Actions, it is important that you perform regular maintenance to keep the related tables in order. Because of the amount of data messaging that can occur when Turbonomic Actions manages a typical IT environment, the tables can fill up quickly.

It is common in ServiceNow for an administrator to execute scripts regularly as a way to perform this kind of chore. We recommend that you execute daily scripts to delete unnecessary records from tables, and to optionally back up the tables before you delete the records.

You should be sure to run scripts daily to clear the following import set tables:

- `x_turbo_turbonomic_ws_action_approval`: The Turbonomic Web Service Action Approval table
- `x_turbo_turbonomic_ws_action_record`: The Turbonomic Web Service Action Record table
- `x_turbo_turbonomic_ws_change_request`: The Turbonomic Web Service Change Request table
- `x_turbo_turbonomic_ws_entity`: The Turbonomic Web Service Entity table

In addition, we recommend that you run scripts regularly to clear the following import set tables:

- `x_turbo_turbonomic_turbonomic_action_approval`: The Turbonomic Action Approval table
- `x_turbo_turbonomic_turbonomic_action_record`: The Turbonomic Action Recordtable
- `x_turbo_turbonomic_x_turbonomic_entity`: The Turbonomic Entity table

Before you deploy such maintenance scripts, you should be sure to review the [Product Specifications and Release Notes \(on page 17\)](#).



Using the Turbonomic Actions Application

Turbonomic Actions is an integration that brings the power of Turbonomic to your ServiceNow® Change Management application. You can use Turbonomic Actions to track the actions that Turbonomic recommends, or to create new Change Requests (CRs) in your ServiceNow instance.

Note that Turbonomic constantly analyzes your application environment. For the Configuration Items (CIs) that you specify, Turbonomic can recommend actions to:

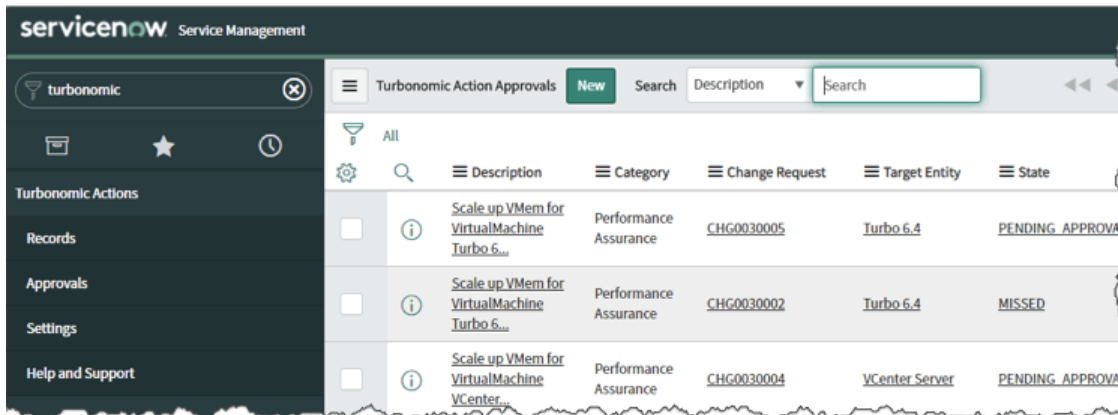
- **Assure application performance**
Prevent bottlenecks, provision physical resources, upsize VMs, and prioritize workload to ensure applications always have the resources they need.
- **Ensure efficient use of resources**
Consolidate workload, downsize VMs, prevent VM sprawl, and take advantage of pricing plans on the cloud.
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Keep workload placement and resource allocation compliant with your business rules.

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User Interface Overview

The user interface GUI makes it easy to view the history of Turbonomic actions, and to manage the CRs that Turbonomic Actions creates.



Your ServiceNow administrator should have already installed the Turbonomic Actions application. To navigate to the user interface, enter `Turbonomic` in the ServiceNow Navigator search bar. This should display the Turbonomic Actions menu. If the menu does not appear, contact your ServiceNow administrator to make sure you have access to Turbonomic Actions.

To navigate to the different views of the Turbonomic Actions GUI, choose from the entries in the menu.

Turbonomic Actions User Documentation

This section of the documentation describes:

- Viewing Turbonomic Actions Records

When the Turbonomic product generates actions for your ServiceNow Configuration Items (CIs), it can post those actions as Turbonomic Actions Records. You can view these records to follow the history of Turbonomic analysis and actions in your environment.

- Working with Change Requests (CRs)

The Turbonomic administrator sets up which actions will generate a ServiceNow CR. You can view the list of CRs to see their status, which CIs they affect, and to move a CR to a different state (for example, approve or reject a CR).

- Administration

To use Turbonomic Actions, it must be properly installed and set up in your ServiceNow environment. Proper setup includes settings to specify the CR type to use, and settings to manage CR assignees.

NOTE:

This section does not describe installation — It assumes that you already have a correctly installed instance of Turbonomic Actions.

Also, this section does not describe how to configure Turbonomic actions so they will integrate with ServiceNow and Turbonomic Actions. It assumes that your Turbonomic has already performed that configuration.

We hope this documentation gives you all the information you require to successfully manage change requests with the Turbonomic Actions application. If you encounter problems, please contact your ServiceNow administrator. This administrator should have contact with Turbonomic. If necessary, the administrator can contact Turbonomic to resolve issues.

Viewing Turbonomic Actions Records

The Turbonomic product continually analyzes your environment. This holistic analysis identifies problems in your environment and the actions you can take to resolve issues and avoid problems before they occur.

Your ServiceNow Change Management application provides an approach to control the life cycle of changes that you make to specific Configuration Items (CIs) in your environment. The Turbonomic administrator configures the Turbonomic product to identify the CIs it will manage, and the specific actions it will integrate with your change management. Turbonomic Actions can log each of these actions in the Turbonomic Actions Records view.

Action OID	Details	Turbonomic Entity	Accepted By	Count	Updated	Lifecycle Stage
0318218ab5a73e9372abc1b111e92d4	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:28	On Generation
e58453ac126b6e0bca2c99c387a26	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:12	On Generation
80ec7c27a9d47eaa13d930c2e1027cb	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:12	On Generation
e48cc5d3436a1e2451158d9986d7145	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:12	On Generation
0adae3b44b501300976d3cd8c83736	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:12	On Generation
709f11066d90021b0d8acc779ee672	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 16:10:12	On Generation
541005b3f6b46c08e07139362299	vCenter VM Right Size Action Details	ACM-1-Tomcat@1-172.25		1	2019-07-23 15:30:36	On Generation

Turbonomic can post actions to the records listing at two different stages:

- On Generation

Post the action as Turbonomic generates it. In Turbonomic this will be a *Pending Action*. Note that if the action becomes invalid (the conditions that caused the action have changed), then Turbonomic removes it from the Pending Actions list. However, it does not post a new record to the listing.

Turbonomic can post the same action to multiple records. If the action became invalid, and then became valid again, Turbonomic will post a new record. Also, if Turbonomic continually generates the same action, it can post multiple records.

- After Execution

If the action was configured to execute automatically, or manually through the Turbonomic process, then post the action after it has been executed.

NOTE:

The Turbonomic Actions Records view can list different actions for different types of CIs. CIs map to Entity Types in the Turbonomic platform. For a listing of actions per entity type, see "Actions by Entity Type" in the *Turbonomic User Guide*.

Each action record includes the following information:

- Action OID

A unique identifier for this action in ServiceNow. Click the OID to open the action record.

- Details

A description of the action.

- Turbonomic Entity

A description of the entity that is discovered and managed by Turbonomic. Click the entry to open the record. From that record, you can view the matching ServiceNow CI.

- Accepted By

If the action was set to be `MANUAL` in the Turbonomic product, then this field shows the Turbonomic user who accepted the given action.

- Count

How often Turbonomic has recommended this same action.

- Updated

The last time that the given record was modified.

- Lifecycle Stage

Can be one of:

- On Generation
- After Execution

Viewing the Affected Configuration Instance(CI)

Each action record includes an entry for the affected entity in your environment. The record shows this as the *Turbonomic Entity*. The Turbonomic entity maps to a CI in your ServiceNow environment.

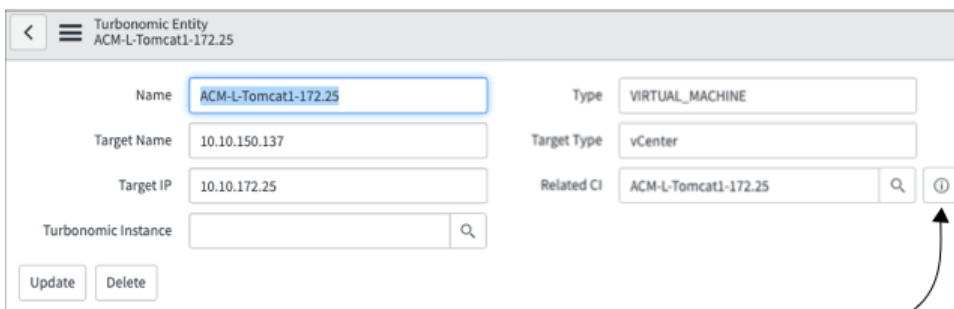
Turbonomic Actions currently works entities from the following technologies:

- VMware vCenter Server
- Microsoft Hyper-V
- Amazon Web Services VMs
- Microsoft Azure VMs

To view the CI details:

1. For the action record you want to inspect, click the entry for Turbonomic Entity.

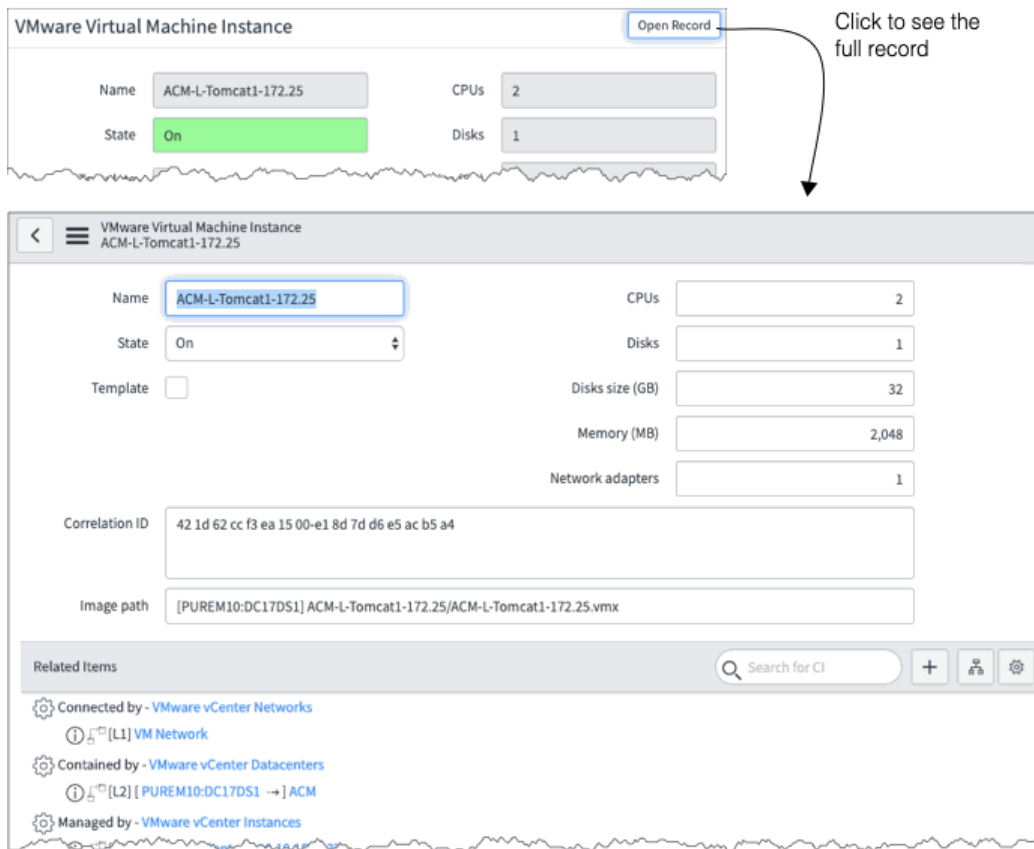
This opens a view of the record.



Click to inspect the Related CI

2. Inspect the Related CI record.

Click the **INFORMATION** icon for the Related CI field. This opens a dialog to view the Related CI record. To see the full information, click **Open Record** in this dialog.

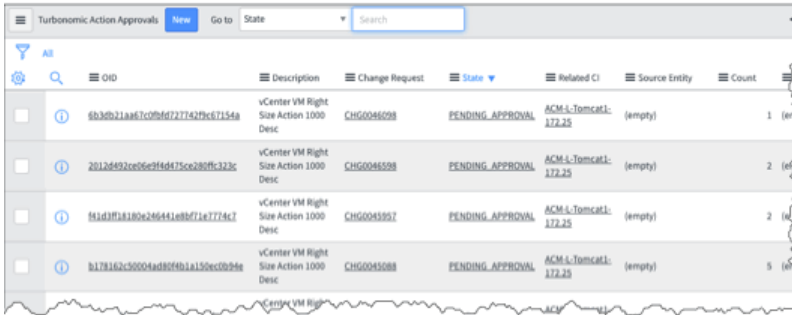


Working With Turbonomic Actions Change Requests

The Turbonomic product continually analyzes your environment. This holistic analysis identifies problems in your environment and the actions you can take to resolve issues and avoid problems before they occur.

Your ServiceNow Change Management application provides an approach to control the life cycle of changes that you make to specific Configuration Items (CIs) in your environment. The Turbonomic administrator configures the Turbonomic product to identify the CIs it will manage, and which specific actions it will pass to ServiceNow as Change Requests (CRs). Turbonomic Actions enters each of these actions in as an entry in the Approvals list. From there you can inspect the related entities, and navigate to the given CR.

Once you navigate to a CR, you can then use the ServiceNow Change Management application to move the CR into its different states. When you move the CR into the `Scheduled` state, then Turbonomic can execute the action – Either immediately, or at the scheduled time for that action.



OID	Description	Change Request	State	Related CI	Source Entity	Count
6b3db21a87c0ff6f727752f9c67154b	vCenter VM Right Size Action 1000 Desc	CHG00465098	PENDING_APPROVAL	ACM-LS-TomcatL-172.25	(empty)	1
20126492ce06e2f4d473ce280ff323c	vCenter VM Right Size Action 1000 Desc	CHG00465098	PENDING_APPROVAL	ACM-LS-TomcatL-172.25	(empty)	2
81adff18180e266441e88f71e7728c7	vCenter VM Right Size Action 1000 Desc	CHG0045897	PENDING_APPROVAL	ACM-LS-TomcatL-172.25	(empty)	2
8178162c50004ad80f0b1a150ec0b9e	vCenter VM Right Size Action 1000 Desc	CHG0045888	PENDING_APPROVAL	ACM-LS-TomcatL-172.25	(empty)	5

NOTE:

The Turbonomic Actions Approvals view can list different actions for different types of CIs. CIs map to Entity Types in the Turbonomic platform. For a listing of actions per entity type, see "Actions by Entity Type" in the *Turbonomic User Guide*.

Each approval record includes the following information:

- Action OID

A unique identifier for this action in ServiceNow. Click the OID to open the approval record. This shows extra information, including Turbonomic data such as:

- Category – The action category. Can be one of Performance, Prevention, Efficiency, or Compliance.
- Type – Can be one of Placement, Right_Size, Start, Stop, Delete, or Configuration.
- Risk – An indicator that Turbonomic uses to show the impact the action will have, where 2000 is the maximum. The higher the risk, the more benefit you will get out of executing the action.

- Description

A description of the action, including the type of action this change will execute.

- Change Request

The identifier for the associated CR. Click the entry to open the CR record.

- State

The current state for the action. This can be one of:

- PENDING_APPROVAL –
The action has been generated, and Turbonomic is waiting to execute it.
- APPROVED –
The action has been approved, and Turbonomic can execute it. If the action has a scheduled window, then execution will occur at that time.
- REJECTED –
The action has been rejected, and Turbonomic discarded it.
- WAITING_FOR_EXEC –
The action has been approved, and Turbonomic is waiting for the execution schedule (in the Turbonomic policy) to open.

- `WAITING_FOR_CR_SCHEDULE` –

The action has been approved, but the CR has a specified schedule window. Turbonomic is waiting for the CR schedule window to open so it can execute the action.

NOTE:

If you have also configured an execution schedule in the Turbonomic policy for actions of this type, you should make sure the Turbonomic schedule window matches the CR schedule window. Incompatible scheduling can result in the action never executing.

- `IN_PROGRESS` –

Turbonomic is executing the action.

- `SUCCEEDED` –

Turbonomic has executed the action and returned success.

- `FAILED` –

Turbonomic has executed the action and returned failure.

- `MISSED` –

The conditions that the action are meant to address are no longer present. Execution of this action is no longer necessary. If the conditions arise at a later time, Turbonomic will generate a new CR.

NOTE:

For an action approval that is marked as `MISSED`, Turbonomic Actions does not change the CR from that state. It is up to your organization to move such a CR into a different state. For example, you can implement a business rule to find all `MISSED` action approvals and mark them as appropriate.

- Related CI

The ServiceNow CI that will be changed by this CR. Click the entry to see the CI record.

- Source Entity

For actions that are based on an existing entity, the initial entity. For example, when moving a VM to a different host, this is the host the VM moves *from*. For a provision VM action, this is the VM that you will copy to provision the new VM.

- Count

How often Turbonomic has recommended this same action.

- Destination Entity

For move actions, the entity you will move to. For example, when moving a VM to a different host, this is the host the VM moves *to*.

- Savings

The estimated saving or cost for the given action. When Turbonomic calculates a saving or cost for the associated action, the CR can display that value. For a required investment (for example, when provisioning a new entity or scaling up an entity), this shows a negative saving.

- Metric

The resource this action will change. For example, on a VM the action can change resources such as VMEM, VCPU, VStorage, or IOPS.

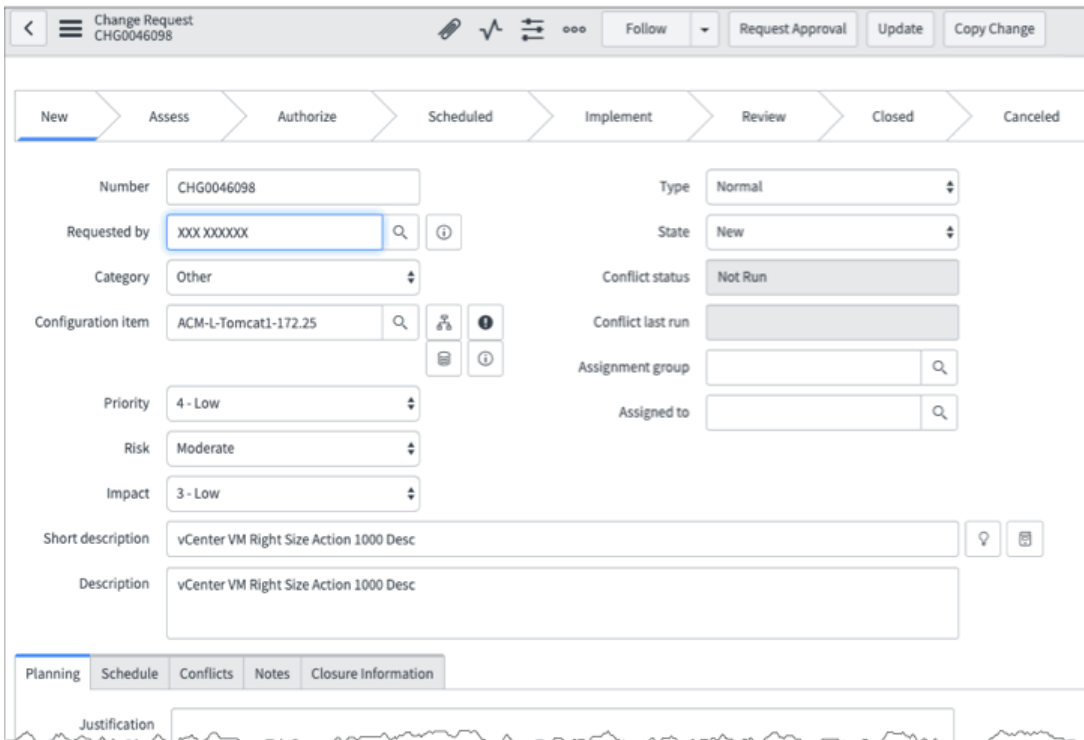
- Turbonomic Entity

A description of the entity that is discovered and managed by Turbonomic. Click the entry to open the record. From that record, you can view the matching ServiceNow CI.

- From
The initial amount of the resource that is indicated in the Metric field.
- To
The amount of the resource the given entity will have after the action executes.
- Updated
When the given record was last posted or changed.

Working With the Change Request

Each record in the Approvals view includes a Change Request field that shows the CR Number. To view the CR and to move it to different states, click the CR Number.



This is a standard CR, according to the CRs you have defined in your Change Management application. You can edit it or move it into different states as you would for any CR.

To accept the change and pass execution approval to Turbonomic, move the change to the `Scheduled` state.

Issues to Consider

As you work with CRs for Turbonomic actions, you should consider the following:

- Multiple CRs for the Same Heap Resize Action:

For Heap Resize actions, Turbonomic can generate multiple CRs for the same action. If that occurs, you should accept the latest CR and ignore the previous ones. The unaccepted CRs will ultimately transition to the `MISSED` state.

For Heap Resize actions, Turbonomic uses an increment, and generates a resize by that increment. The default increment is 128 MB. If you need to increase heap by more than 240 MB, then Turbonomic generates two separate

actions at different times; the first action to increase by 128 MB and the second action to increase to the full 240 MB. This creates two separate CRs. You should manage the second of those, and let the first one transition to MISSED.

- **Actions That Turbonomic Cannot Automate:**

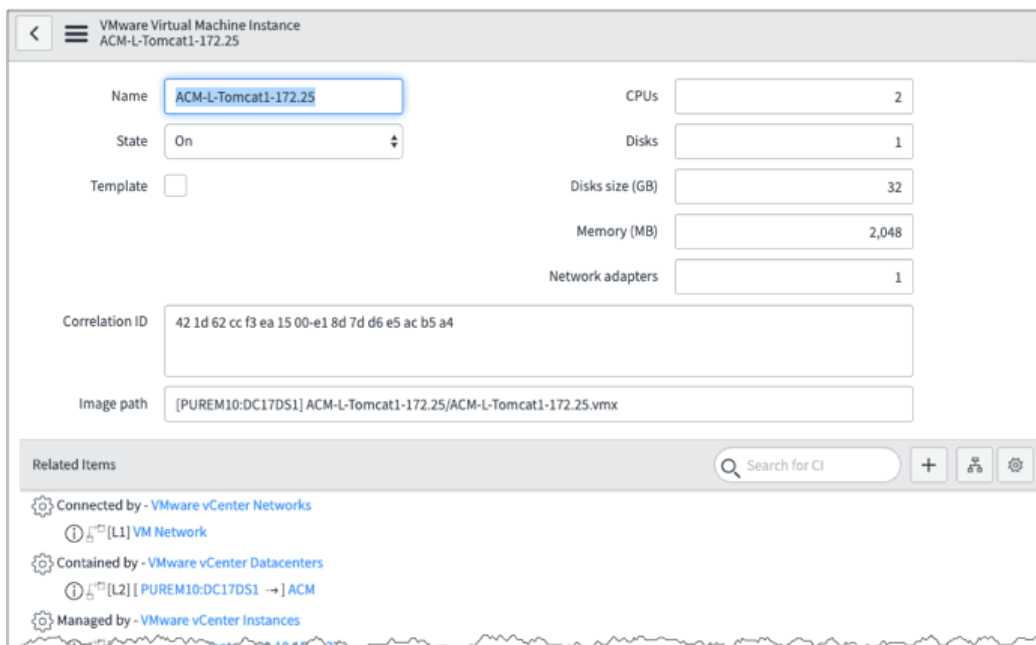
There are circumstances where Turbonomic generates an action that it cannot execute automatically, and sends it to ServiceNow to generate a CR. In this case, when the CR is approved Turbonomic does not execute the action, and after 24 hours the CR state changes to MISSED.

This is expected behavior. There are acceptable reasons for the action to be one that Turbonomic cannot execute. For example, the action can be of a type that Turbonomic cannot automate, but you configured a policy to send the action to ServiceNow. In this case, you should manually:

- Execute the action outside of Turbonomic
- Close the CR related to this action
- Close the related Action Approval record

Viewing the Affected Configuration Instance(CI)

Each action record includes an entry for the Related CI in your environment. To view the CI details, click the CI identifier.



This is a standard ServiceNow CI that you can inspect to see the image path, other information about the entity, and a list of related items.