Densify

Kubex Policy Reference Guide

Densify 2.9.0

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Kubex

Contents

Introduction

Target Audience

This guide provides descriptions of commonly used policy settings. It is intended for Kubex users who are managing cloud and container environments. Contact your account manager to arrange a policy review

Topic Organization

This is a reference guide that provides basic descriptions of Densify container and policy settings.

The following table is provided for each policy setting.

Description	Short description of policy setting
Use Case	• Describes business purpose and desired outcomes • Provides high level use case examples • Best practices and considerations on using this setting
Values/Units	Possible values and units
Dependencies	• Prerequisites • Related policy settings • Related attributes • Related environment settings/configurations
Example	Provides context for how the setting can be used for a given use case, including outcome

The Index provides the list of all policy settings under keyword "policy settings:" and the list of all attributes used by policy settings under keyword "attributes with policy impact:".

Conventions

These topics uses icons to represent the following:

	Commonly modified policy setting: Well understood and typically differs between organizations and environments
	Commonly modified policy setting: Highly dependent on the host hardware, storage and network infrastructure
	Advanced policy setting: Only displays when the Advanced policy display toggle is enabled

Representative Day

Representative Day Settings

Densify uses a single day of workload data in its analytics. This single day is derived from a range of workload history, in a way to best represent the workload and meet the operating goals of each environment or infrastructure group. For this reason, it is termed the representative day.

Table: Representative Day Settings

Representative Day Value	Description
Busiest	Actual day with the highest utilization levels from selected days of workload history.
Typical (median)	Actual day with the median utilization levels from selected days of workload history.
Least Busy	Actual day with the lowest utilization levels from selected days of workload history.
Average	Composite workload day computed by averaging utilization statistics from selected days of workload history.
Combined (legacy algorithm)	Composite workload day based on combining data samples and preserving hourly patterns from selected days of workload history. Exclude actual days if percentile settings are specified to exclude outlier data.
Combined (preserve hourly patterns)	Composite workload day with hourly patterns preserved based on combining data samples from selected historical workload statistics. Excludes actual data samples if percentile settings are specified to exclude outlier data.
Combined (ignore hourly patterns)	Composite workload day with hourly patterns ignored based on combining data samples from selected historical workload statistics. Excludes actual data samples if percentile settings are specified to exclude outlier data.

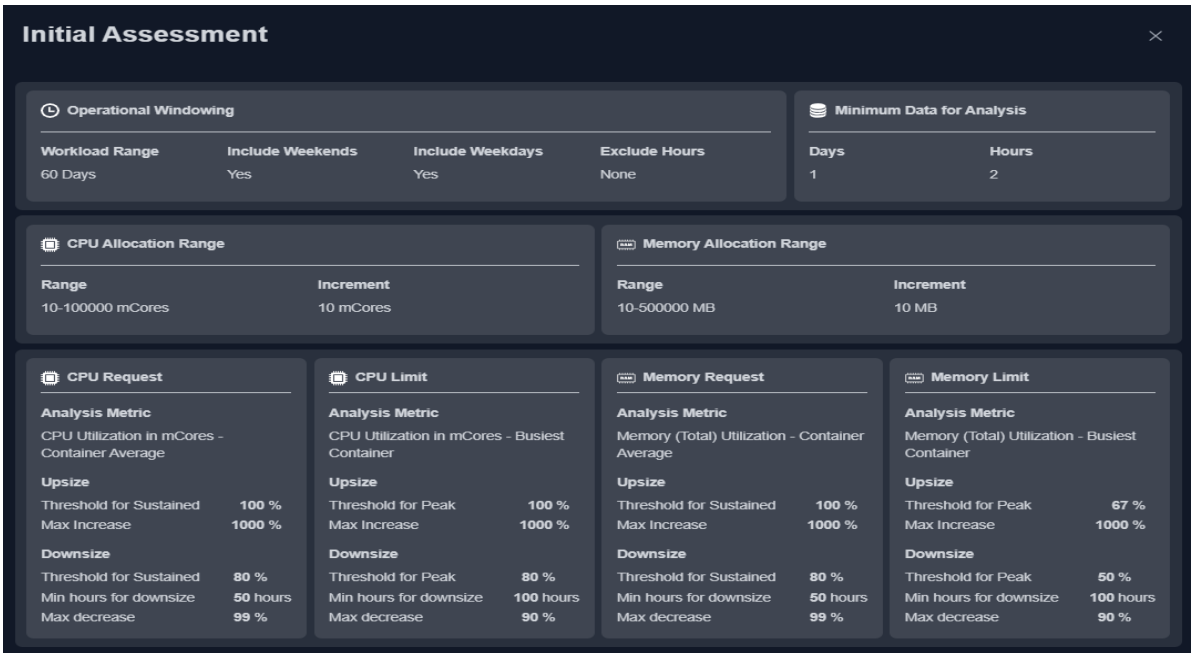
Container Optimization Policy

The Container Optimization policy contains the settings used to optimize your container platforms.

A policy can be customized to better match your business requirements. Contact your account manager to review and change your policy settings.

The Policy Summary flyout menu in the Kubex interface lists commonly used settings. The displayed settings are a subset of the full policy.

Figure: Policies Flyout Menu



Representative Workload & Operational Windowing

The policy settings in the category **Representative Workload & Operational Windowing** affect the selection and scope of historical utilization data to model source system workloads.

The following settings are applicable to container services.

Workload - Range

Table: Workload - Range

Description	The number of days to be included in the analyses.
Use Case	If there are more than 30 days of data collected, and you have specified 30 days, then the last 30 days will be used.
Values/Units	A value representing # of days
Dependencies	This setting has no effect when setting **Workload Range Type** above is set to "All Available Data". Otherwise, **Workload Range Type** defines the number of days as calendar or available days.
Example	

Include Weekdays

Table: Include Weekdays

Description	Specifies whether or not weekdays are to be included in the analyses.
Use Case	The workload is collected and used. The day of week filter applies to both host and VM workloads. Usage is based on customer preference. Workload is collected from one of the following, depending on your use case: - VM and host for VMware - Cloud instance - Pod for Kubernetes
Values/Units	Possible values: - Yes - No
Dependencies	For Resizing Assessment, value should be inherited from the target's Control Console policy setting **Operational Windowing** > **Include Weekdays**. This inheritance is a manual process.
Example	

Include Weekends

Table: Include Weekends

Description	Include workload days from weekends.
Use Case	The workload from both the VM and host is collected and used. The day of week filter applies to both host and VM workloads. Usage is based on customer preference.
Values/Units	Possible values: Yes No
Dependencies	For Resizing Assessment, value should be inherited from the target's Control Console policy setting **Operational Windowing** > **Include Weekends**. This inheritance is a manual process.
Example	

Exclude Hours (e.g. 0-7, 12, 18-23)

Table: Exclude Hours (e.g. 0-7, 12, 18-23)

Description	Specifies hours to be excluded from each day that is included in the range.
Use Case	The workload from both the VM and host is collected and used. The exclude hours filter applies to both host and VM workloads. Usage is based on customer preference.
Values/Units	Input range of hours in 24 hour clock format. e.g. 0-7, 12, 18-23.
Dependencies	For Resizing Assessment, value should be inherited from the target's Control Console policy setting **Operational Windowing** > **Exclude Hours (e.g. 0-7,12,18-23)**. This inheritance is a manual process.
Example	If you have a backup window you would like to exclude, specify the time and duration of the backup, for example 3-5.

Required Minimum Number of Hours of Data per Day

Table: Required Minimum Number of Hours of Data per Day

Description	Specifies the minimum number of hours per day that must be available on a given day in order for that day to be considered usable for analysis.
Use Case	Only days that are considered usable are then used as a basis for selecting the **Representative Day** and meeting **Required Minimum Number of Days of Data in Scope** criteria, both described below. VMware only: The workload from both the VM and host is collected and used. This filter applies to both host and VM workloads. Cloud: The workload from only the cloud instance is collected and used. Usage is based on customer preference.
Values/Units	A value representing the # of hours per day (e.g. 24).

Dependencies	
Example	

Required Minimum Number of Days of Data in Scope

Table: Required Minimum Number of Days of Data in Scope

Description	Specifies the minimum number of days of data required in order to consider that sufficient data is available for a given system. Only systems having this amount of data are considered to have sufficient data for the analysis.
Use Case	VMware only: The workload from both the VM and host is collected and used. This filter applies to both host and VM workloads. Cloud: The workload from only the cloud instance is collected and used.
Values/Units	A value representing the # of days (e.g. 7)
Dependencies	This value should never be higher than setting **Workload - Range** as it will result in all systems having Insufficient data.
Example	

- Include Days/Samples Between (Top Percentile)

Table: Include Days/Samples Between (Top Percentile)

Description	Controls the top boundary of day/samples exclusion range.
Use Case	If required, outlier values may be discarded using this setting; less sensitive environments may allow exclusions.
Values/Units	A value representing a percentile value between 1 and 100
Dependencies	For Resizing Assessments, this value should be inherited from the target's Control Console policy setting: **Representative Day Selection** > **VM Level (High Limits) - Include Top Percentile**. This inheritance is a manual process.
Example	If this setting is 95 then 5% of the busiest days/samples will be excluded when calculating the **Representative Day**.

Container Sizing - CPU Upsize

The following policy settings are used to correctly size your container instances.

CPU Request - Threshold for Threshold for Sustained

The following information can be used for "CPU Request - Threshold for Sustained" and for "CPU Request - Threshold for Daily Average".

Table: CPU Request - Threshold for Sustained

Description	Specifies the upper limit for CPU utilization to be used when calculating the CPU request value using the Sustained scoring strategy.
Use Case	

Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

CPU Limit - Threshold for Peak

Table: CPU Limit - Threshold for Peak

Description	Specifies the upper limit for CPU utilization to be used when calculating the CPU limit value using the Peak scoring strategy.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

When analyzing a container that has unspecified CPU and /or memory limits, this means that it is unlimited (restricted only by the node, on which it is running) so setting any limit is essentially a reduction and as such, Densify uses the "Downsizing Limit - Threshold" settings. See Container Sizing - CPU Downsize and Container Sizing - Memory Downsize.

Container Sizing - CPU Downsize

The following policy settings are related to correctly sizing your container instances.

CPU Request - Threshold for Sustained

The following information can also be used for "CPU Request - Threshold for Sustained" and for "CPU Request - Threshold for Daily Average".

Table: CPU Request - Threshold for Sustained

Description	Specifies the lower limit for CPU utilization to be used when calculating the CPU request value using the Sustained scoring strategy.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

CPU Limit - Threshold for Peak

Table: CPU Limit - Threshold for Peak

Description	Specifies the upper limit for CPU utilization to be used when calculating the CPU limit value using the Peak scoring strategy.
Use Case	

Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

When analyzing a container that has unspecified CPU and /or memory limits, this means that it is unlimited (restricted only by the node, on which it is running) so setting any limit is essentially a reduction and as such, Densify uses the "Downsizing Limit - Threshold" settings. See also, Container Sizing - Memory Downsize

Utilization History for CPU Limit Downsize

Table: Utilization History for CPU Limit Downsize

Description	Specifies the minimum number of hours of historical workload required to make the downsize recommendation, based on the above CPU Limit settings.
Use Case	
Values/Units	A numeric value in hours.
Dependencies	
Example	

Container Sizing - CPU Allocation Ranges

The following policy settings are related to correctly sizing your container instances.

CPU - Allocation Range

Table: CPU - Allocation Range

Description	Specifies a list and/or a range of allowed CPU allocation values in mCores.
Use Case	
Values/Units	Default range: 10-10000 mCores
Dependencies	
Example	100,200,400, 600,800 or 100-800

CPU - Allocation Increment

Table: CPU - Allocation Increment

Description	Specifies the step size by which the CPU allocation range can be incremented.
Use Case	
Values/Units	Default increment is 10 mCore.
Dependencies	

Example	If CPU - Allocation Range is 100-800 and CPU - Allocation Increment is 10, then the allowed CPU allocations are: 100, 110.

CPU Request/Limit - Max Increase (%)

Table: CPU Request/Limit - Max Increase (%)

Description	Specifies the maximum increase to the vCPU request or limit allocation that can be recommended. There are 2 separate settings.
Use Case	
Values/Units	The value is expressed as a percentage of the current allocation.
Dependencies	
Example	

CPU Request/Limit - Max Decrease (%)

Table: Memory Request/Limit - Max Increase (%)

Description	Specifies the maximum increase to the vCPU request or limit allocation that can be recommended. There are 2 separate settings.
Use Case	
Values/Units	The value is expressed as a percentage of the current allocation.
Dependencies	
Example	

Container Sizing - Memory Upsize

The following policy settings are related to correctly sizing your container instances.

Memory Request - Threshold for Sustained

The following information can also be used for "Memory Request - Threshold for Sustained" and for "Memory Request - Threshold for Daily Average".

Table: Memory Request - Threshold for Sustained

Description	Specifies the upper limit for memory utilization to be used when calculating the memory request value using the Sustained scoring strategy. The threshold value indicates that when Densify determines the request/limit, it must accommodate the sustained activity within 90% of the requested/limit value. This does not mean that Densify takes 90% of the sustained value and sets that as the request. It means 90% of the request will accommodate the observed sustained activity. The lower the threshold value, the more conservative the setting. i.e. if the threshold

	is set to 80%, then the observed sustained activity must fit within 80% of the request value. This is also applicable to the Peak and Daily Average settings. i.e. The threshold value must accommodate the peak or daily average activity within 90% of the requested/limit value.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

When analyzing a container that has unspecified request values, this means that the Container has no guarantee of any resources so setting any request value is essentially an increase and Densify uses the "Upsizing Limits - Threshold" policy settings, in this case. See also Container Sizing - CPU Upsize.

Memory Limit - Threshold for Peak

Table: Memory Limit - Threshold for Peak

Description	The threshold value indicates that when Densify determines the request/limit, it must accommodate the sustained activity within 90% of the requested/limit value. This does not mean that Densify takes 90% of the sustained value and sets that as the request. It means 90% of the request will accommodate the observed sustained activity. The lower the threshold value, the more conservative the setting. i.e. if the threshold is set to 80%, then the observed sustained activity must fit within 80% of the request value. This is also applicable to the Peak and Daily Average settings. i.e. The threshold value must accommodate the peak or daily average activity within 90% of the requested/limit value.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

Container Sizing - Memory Downsize

The following policy settings are related to correctly sizing your container instances.

Memory Request - Threshold for Sustained

The following information can also be used for "Memory Request - Threshold for Sustained" and for "Memory Request - Threshold for Daily Average".

Table: Memory Request - Threshold for Sustained

Description	Specifies the upper limit for memory utilization to be used when calculating the memory request value using the Sustained scoring strategy.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

Memory Limit - Threshold for Peak

Table: Memory Limit - Threshold for Peak

Description	Specifies the upper limit for Memory utilization to be used when calculating the Memory limit value using the Peak scoring strategy.
Use Case	
Values/Units	A numeric value representing a percentage from 0 to 400%.
Dependencies	
Example	

Container Sizing - Memory Allocation Ranges

The following policy settings are related to correctly sizing your container instances.

Memory - Allocation Range

Table: Memory - Allocation Range

Description	Specifies a list and/or a range of allowed memory allocation values in MB.
Use Case	
Values/Units	Default range: 10-50000 MB
Dependencies	
Examples	512,1024,2048 or 1024,2048-16384

Memory - Allocation Increment

Table: Memory - Allocation Increment

Description	Specifies the step size by which the Memory allocation range can be incremented.
Use Case	
Values/Units	Default increment is 10 MB.
Dependencies	
Example	

Memory Request/Limit - Max Increase (%)

Table: Memory Request/Limit - Max Increase (%)

Description	Specifies the maximum increase to the memory request or limit allocation that can be recommended. There are 2 separate settings.
Use Case	
Values/Units	The value is expressed as a percentage of the current allocation.
Dependencies	
Example	

Memory Request/Limit - Max Decrease (%)

Table: Memory Request/Limit - Max Decrease (%)

Description	Specifies the maximum decrease to the memory request or limit allocation that can be recommended. There are 2 separate settings.
Use Case	
Values/Units	The value is expressed as a percentage of the current allocation.
Dependencies	
Example	

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