Performance monitoring using dynamic thresholds

Infrastructure Analytics Advisor supports monitoring of the performance metrics defined for your infrastructure resources using dynamic thresholds.

**Dynamic thresholds**

Dynamic thresholds are calculated automatically by analyzing the load pattern from the historical data. These values are adaptive in nature and changes over a period of time depending on the performance of your resources, workload changes and so on. You can monitor only the user resources, such as volumes, VMs, and hosts by using dynamic thresholds.

The scenarios when you would use dynamic threshold values for monitoring your environment are as follows:

- When SLOs and other performance parameters are not established with the customer
- When you want to monitor your environment for stable performance and detect irregular behavior

**Advantages of dynamic thresholds**

With changing business requirements and performance goals, monitoring performance of your environment using predefined static thresholds might not be a feasible solution. The static values are calculated through trial and error, which is often time-consuming. These values become out of context in the long-term and the settings must be re-evaluated to ensure compliance.

Manually altering the thresholds each time there is a change in the system dynamics is a futile effort. By automating the threshold setting you gain better visibility into your environment and performance trend patterns. Dynamic thresholds adapt to your environment and proactively sends alerts before the performance bottleneck occurs.

**Determining if the computed value is correct**

If the computed values match your requirements, you can continue to use the dynamic thresholds for monitoring your environment. If you receive too many false alerts, you can manually edit the dynamic threshold values. For example, during migration process, a resource might have a large number of disk IOs temporarily and you might receive a number of false alerts. In this situation, you can manually edit the baseline value to account for the temporary increase in the load, and then allow the system to dynamically adjust the baseline values when the stable operation is restored.

**Automatic calculation of baseline values**

Determining an appropriate threshold is essential while monitoring business critical applications. Infrastructure Analytics Advisor analyzes the peak, normal, and low volume phases based on the historical data and adjusts the monitoring threshold.
thresholds accordingly. Automating the threshold calculation eliminates false alerts and reduces the number of alerts to investigate which might otherwise become a management overhead.

The application workloads might vary at different times of the day or week. For example, the workload pattern of an OLTP application might be different on weekdays and weekends. You can manage varying workloads that occur at different time periods for an application by creating monitoring plans. The system analyzes the performance data accumulated in the scheduled baseline period for computing the dynamic threshold values.

The following example shows the response time metrics of a business-critical application monitored over time and how the system derives the automatic threshold values based on the past performance. The high-level steps the system uses to calculate the automatic baseline values are as follows:

- Analyzes historical data for identifying the performance patterns in the specified baseline period.

![Response time distribution with outliers](https://knowledge.hitachivantara.com/Documents/Management_Software/Infrastructure_Analytics_Advisor/2.1/Data_analytics...)

- Detects and removes the occasional outliers: In the following example, the data points that deviates from the norm represent the outliers. The system ignores the outliers appearing at irregular intervals to calculate an appropriate threshold value.
• Calculates the maximum value: The upper limit of the values in the normal range is used to calculate the maximum value. After determining the maximum value, the system adds the margin of error to the computed value.

• Determines the weighted average: The weighted average derives the threshold values based on the past performance trends over a specified time period.

Setting dynamic thresholds using monitoring profiles

You can create monitoring profiles with dynamic thresholds for managing user resources only. System resources cannot be monitored using dynamic thresholds.

Using the user resource threshold profile, you can apply dynamic thresholds across user resources within your environment. For example, using a user resource threshold profile, you can apply a dynamic threshold setting for all volumes in an application.

You can create monitoring plans for an OLTP application, whose workloads vary during weekdays and weekends. You can also create a separate plan for monitoring batch jobs that run at night. The procedure for enabling dynamic thresholds is as follows:
Procedure

1. On the Administration tab, from the navigation pane select Monitoring Settings User Resource Threshold Profiles Create Threshold Profile.

2. In the Create User Resource Threshold Profile window, enter the profile name, description, select the resource type, and the acceptable margin of error for sending alerts (Severe, Normal, and Rough).

3. Under Monitoring Plans, click Create Plan to create new monitoring plans. You can either edit the base plan, or create a new plan.

4. In the Create Plan window, enter the plan name, and set the target period. Under Target metric, you will see a list of performance metrics related to the selected resource.

5. Click Dynamic to enable dynamic monitoring mode and click OK.

6. To save the profile, click OK.
    After you save the profile, you are navigated to the profile detail window, where you can assign target resources, or create resource assignment rules.

7. In the profile detail window you can do the following:
◦ On the Assignment Rules tab, you can create rules for assigning resources to the monitoring profile automatically.

◦ On the Target Resources tab, you can assign the resources to the profile manually. You can also view the existing target resources associated to the monitoring profile.