Problem Detection and Notifications

Dynatrace Training Module

dynatrace

Agenda

- Overview of Dynatrace Problems
- How Problems are detected
  - Events
  - Baselines
  - Thresholds
- Frequent Issues
- Problems Severity Types
- Problems Overview Page
- Alert Profiles
- Problem Notifications
- Maintenance windows

Problems Overview

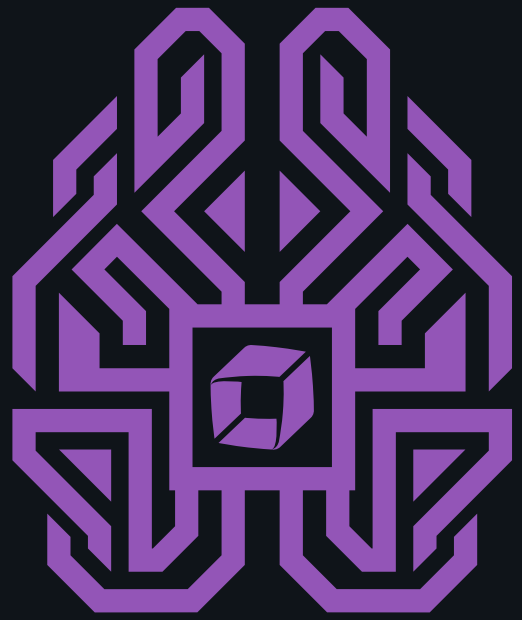
Problem Overview

- Dynatrace uses a sophisticated AI causation engine, called Davis®, to automatically detect performance anomalies.
- Dynatrace applications, services, processes, hosts and externally supplied metrics are analyzed.
- Dynatrace-detected problems are used to report and alert on abnormal situations, such as performance degradations, failure rate increases, high resource consumption or lack of availability.
- Problems have defined lifespans and are updated in real time with all incoming events and findings.

https://www.dynatrace.com/support/help/shortlink/problems-hub

Problem Overview

- *A Problem is a logical grouping of all related events, context, and root-cause analysis details for a given incident in your monitoring environment*
- Problems are what you work with when being notified of and responding to issues in your monitored applications
- Davis® powers the problem creation and root cause analysis.



What is a problem?

How Problems are detected

- Dynatrace continuously monitors certain metrics against auto-created baselines or fixed thresholds.
- Events can represent different types of individual incidents
- Events can be metric-threshold breaches, baseline deviations or availability issues
- Not all events warrant a problem. Events can also be point-in-time events, VMotions, software deployments or configuration file changes.
- Events can be detected within Dynatrace data or pushed from external sources (e.g. Azure Events or Deployment Tools).
- "Severe" Events will result in a Problem being created. Some Examples:
  - Unexpected high or low traffic
  - Slower response times
  - Increased failure rates
  - High CPU or memory utilization
  - Network Issues

Understanding Event Thresholds

- Dynatrace utilizes two types of thresholds to create events
- Automated baselines
  - Multidimensional baselining automatically detects individual reference values that adapt over time.
  - Automated baseline reference values are used to cope with dynamic changes within your applications or service response times, error rates, and load.
  - Multidimensional baselining works out of the box and automatically adapts to changes in patterns.
- Static thresholds
  - Dynatrace uses built-in static thresholds for all infrastructure events (for example, detecting high CPU, low disk space, or low memory).
  - Thresholds are set out-of-the-box but can be customized.

https://www.dynatrace.com/support/help/shortlink/problems-intro#understanding-thresholds

Automatic baselining summarized

- Baselines are evaluated over 5-min (for fast changing values) and 15-min (for slow changing values) sliding time intervals
- Median and 90th percentiles are evaluated
- Values for response times, error rates and load are automatically detected for each individual application and service.
  - Each Application baseline is split by user action, geolocation, browser type and hardware type (such as Windows or Linux)
  - Services are baselined by each service request
- Applications and services must run for at least 20% of a week (~1.5 days) before slowdown and error rate Problems are raised
- Applications and Services must run for at least a full week before traffic spike and drop Problems are created

https://www.dynatrace.com/support/help/shortlink/automated-baselining

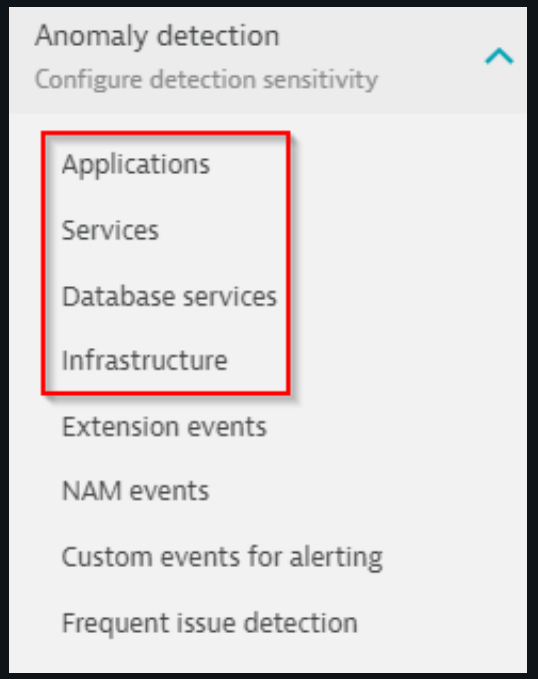
Adjusting Threshold Sensitivity

- Typical application and service-level anomalies reported by Dynatrace include
  - Failure rate increases
  - Response time degradation
  - Spikes or Drops in application traffic.
- Dynatrace allows you to define specific thresholds that specify at what amounts above baseline performance are severe enough to generate problem alerts.
- Keep in mind that these threshold settings only adjust the levels at which Dynatrace alerts you to detected anomalies.
- These settings don't affect automated performance baselining.

https://www.dynatrace.com/support/help/shortlink/problem-detection-sensitivity

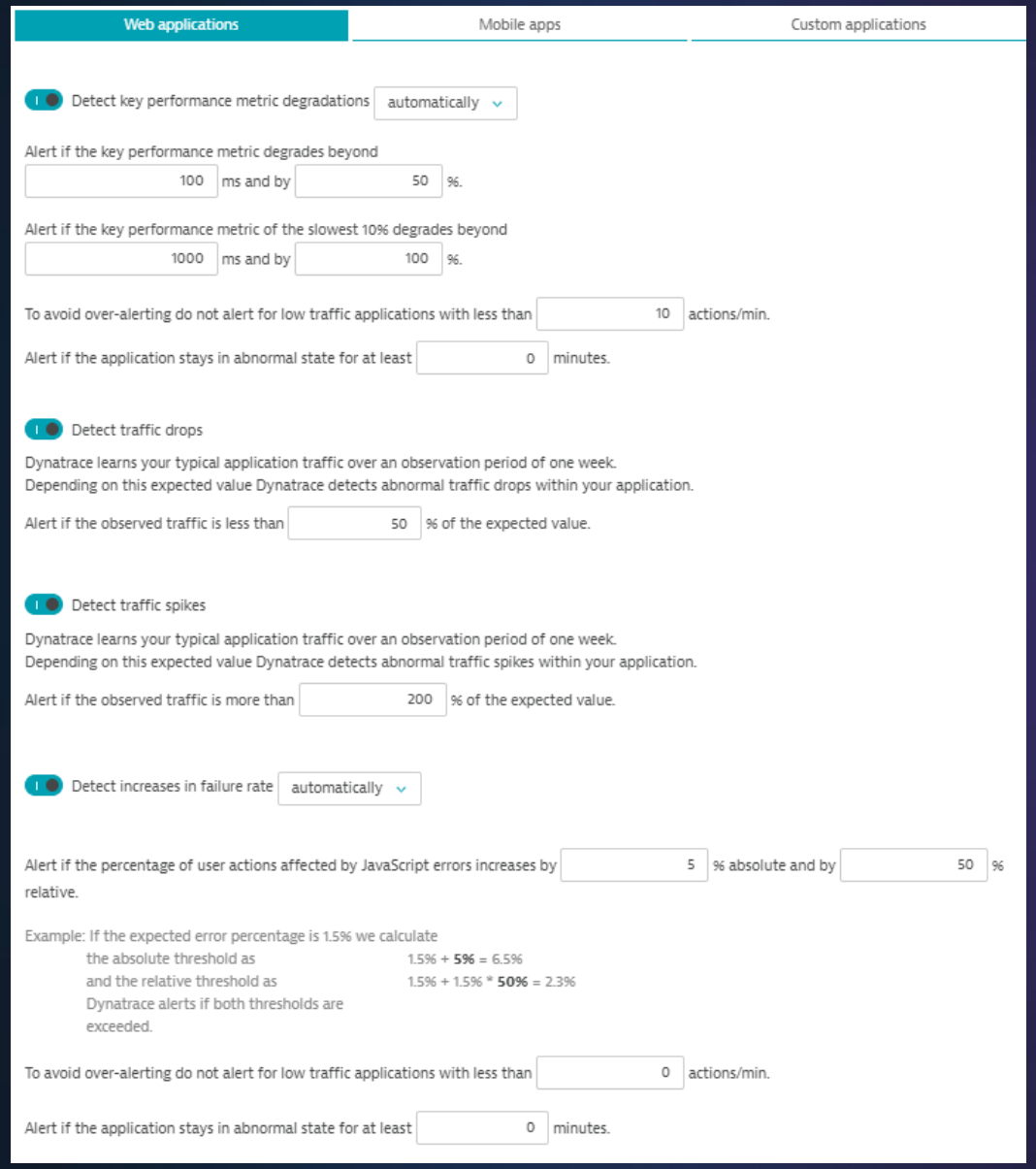
Adjusting Threshold Sensitivity – Global Settings

- Typically, the global settings are set at a good starting point when starting to monitor the environment.
- Change the Global settings if there are extensive false-positive problems being created; such as while monitoring a development-only environment.
- If specific applications, databases, services or hosts are over-alerting, modify the anomaly detection settings on the specific entity.
- Modify global settings by navigating to Settings->Anomaly detection and selecting the entity type: Applications, Services, Database services or Infrastructure.



Adjusting Threshold Sensitivity – examples

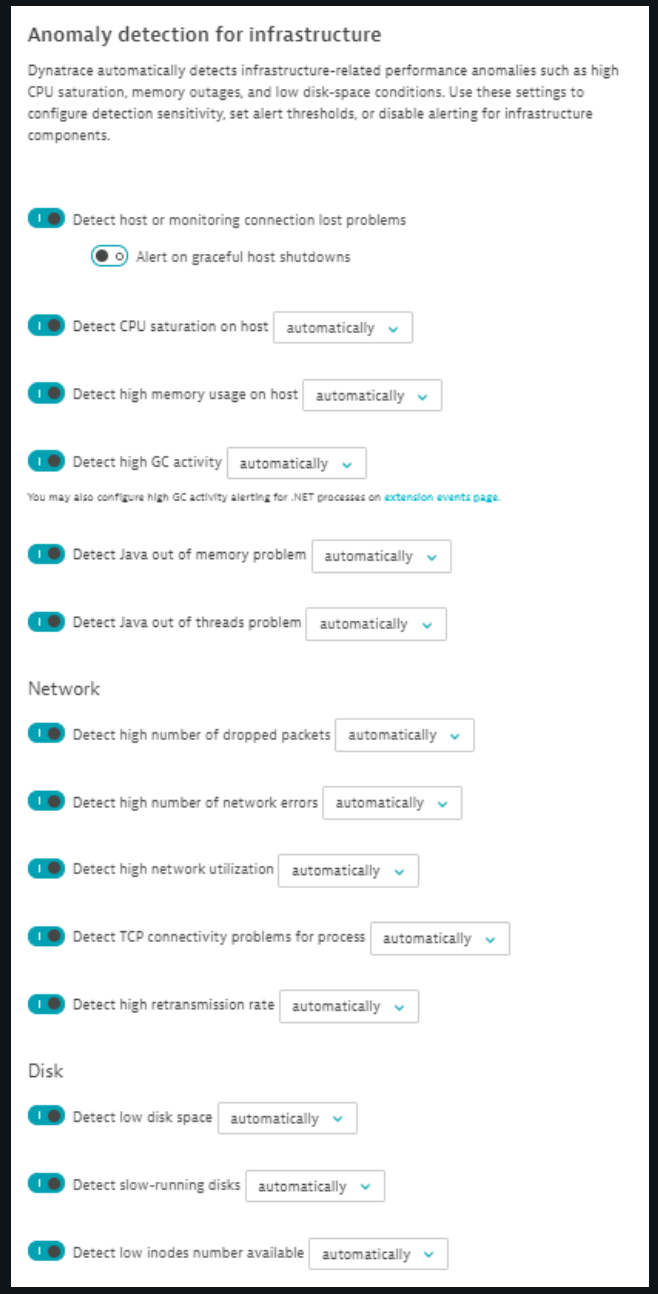
- Applications, Services and Database services have similar configurations for:
  - Performance
  - Error Rates
  - Traffic Drops
  - Traffic Spikes
- Applications detect increased JavaScript error rates.
- Services detect failure rates (HTTP 400-500 status)
- Database Services also detect failed database connects.
- Services and Database Services have traffic drop and spike detection off by default.



Adjusting Threshold Sensitivity – examples

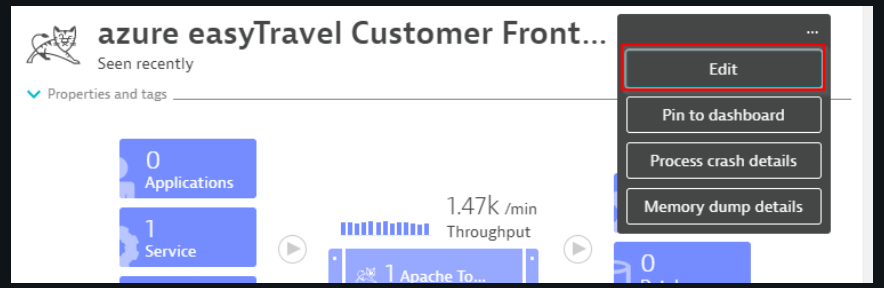
- Davis automatically detects infrastructure-related performance anomalies such as high CPU saturation, memory outages, and low disk-space conditions across both physical and virtual infrastructure components.
- Infrastructure monitoring typically uses static thresholds.

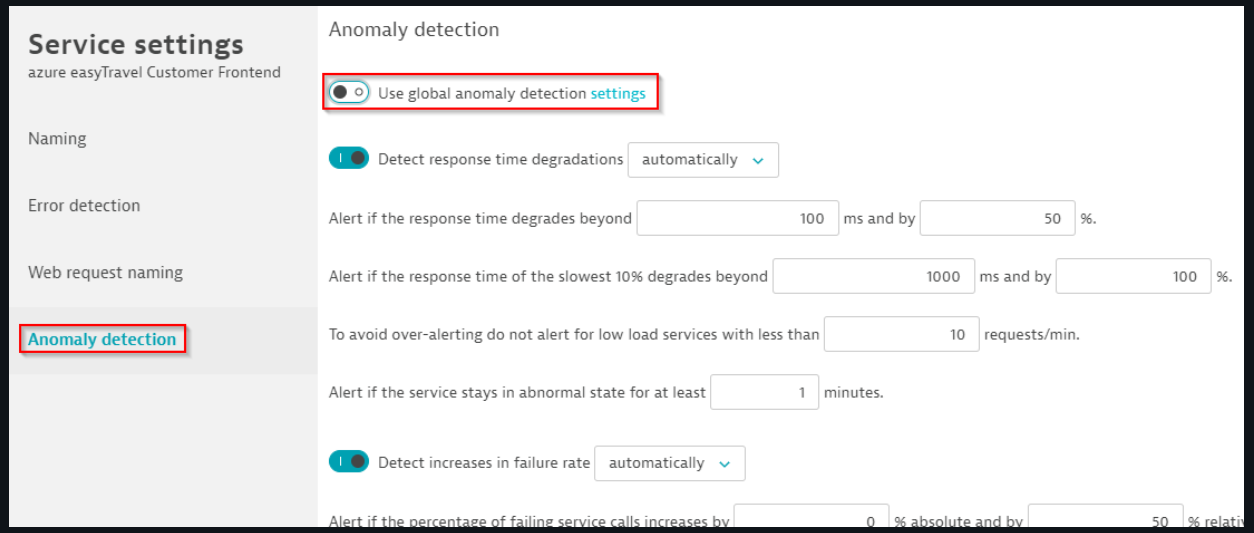
https://www.dynatrace.com/support/help/shortlink/problem-evaluation



Adjusting Threshold Sensitivity – Host group or entity Settings

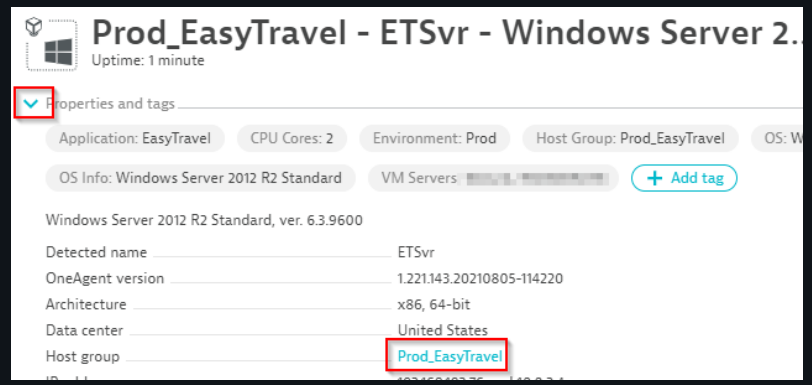
- Global thresholds can be overridden at a Host Group or on an individual entity.
- If a specific Application, Service or Database Service is over alerting, or under alerting:
  - Navigate to the entity
  - Edit the settings on the entity
  - Open the Anomaly detection settings to disable the global setting inheritance
  - Set custom thresholds on the object itself.

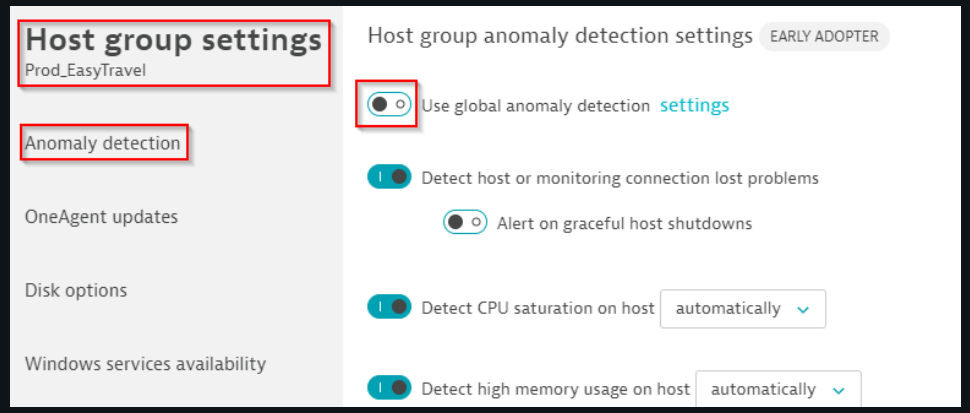




Adjusting Threshold Sensitivity – Host group or entity Settings

- Typically hosts performing the same function will be in the same Host Group
- Those hosts may also need to have the same detection settings.
- Navigate to the Host Group for the host
  - Open one host in the group
  - Open the properties
  - Select the Host Group in the properties list
- Disable global setting inheritance
- Modify the settings on the Host Group to change the settings for all hosts in the group.
- Individual hosts can still have unique settings if needed.





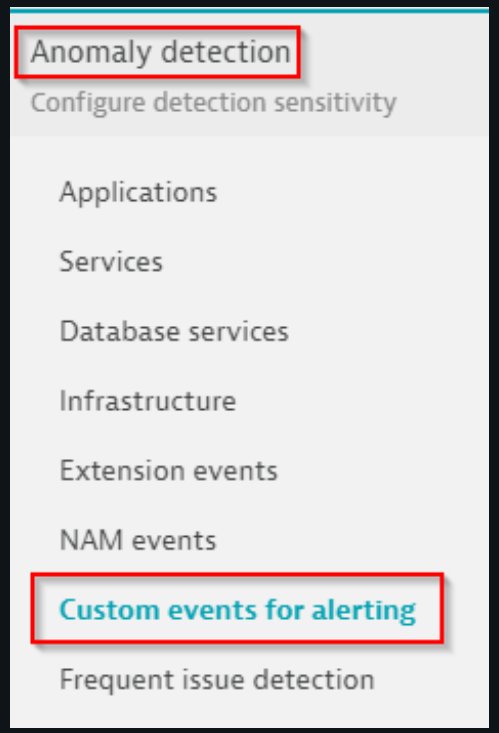
Custom Events

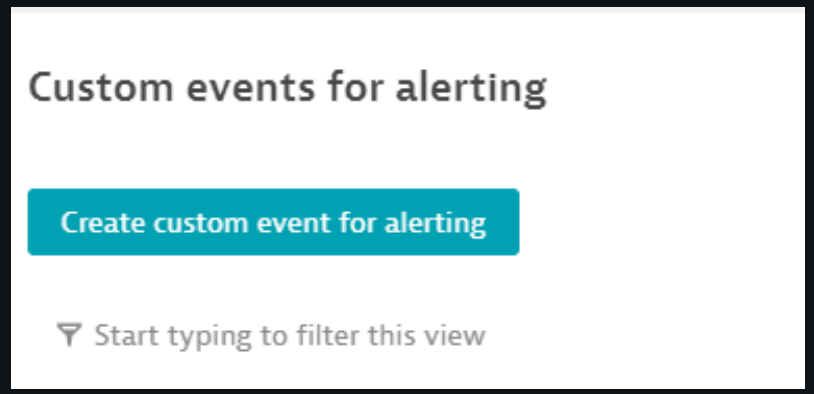
- Custom events can be configured in addition to the wide range of events automatically detected.
- Multiple events can be configured with different thresholds to indicate warning or severe events.
- Any Metric captured or imported into Dynatrace can be used.
- Custom Metrics created in Dynatrace can be used. Such as:
  - Calculated Metrics from Multi-Dimensional Analysis views
  - Log metrics, etc
- Static thresholds or auto-adaptive baselines can be utilized to create the event.

https://www.dynatrace.com/support/help/shortlink/metric-events-for-alerting

Custom Events

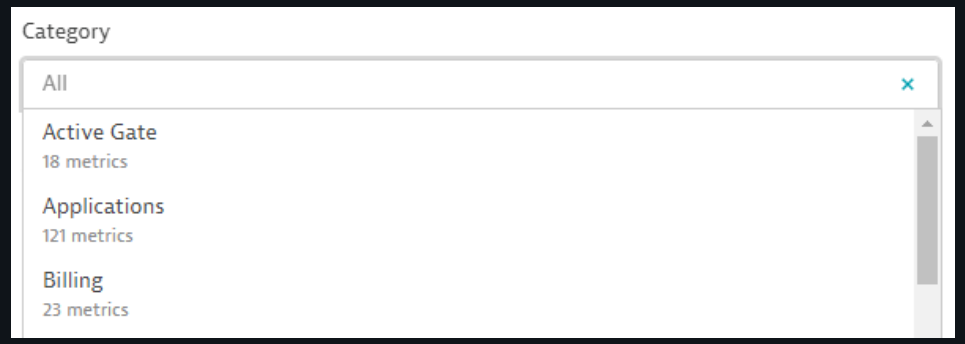
- Navigate to Settings->Anomaly Detection->Custom events for alerting
- Select “Create custom Event for Alerting”

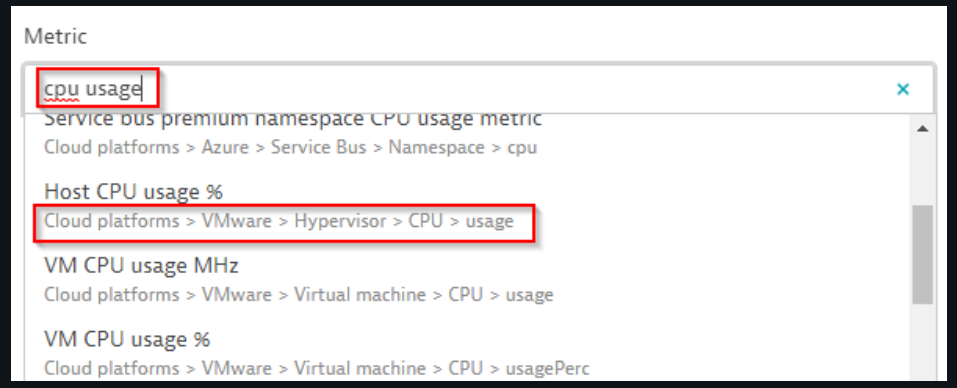


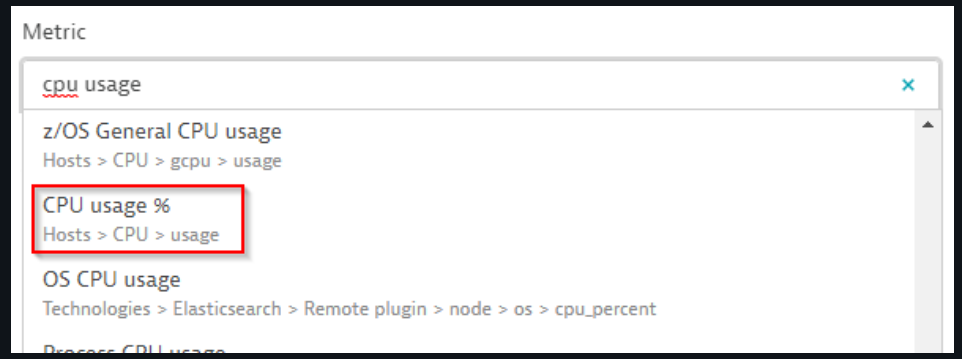


Custom Events – Select the Metric

- Utilize the "Category" pull down to view the metric groupings
- Select the Metric to create the event.
  - Use the pull-down to view the list of available metrics.
  - Type in the name of the metrics to filter the list.
  - Be careful to review the second line in the metric to ensure the correct metric is being selected.
  - Typing text in the metric field will also search the second line in the metric. For example, try "mobile".
  - Expert tip: type in "calc" in the dialog to get a list of all calculated metrics.

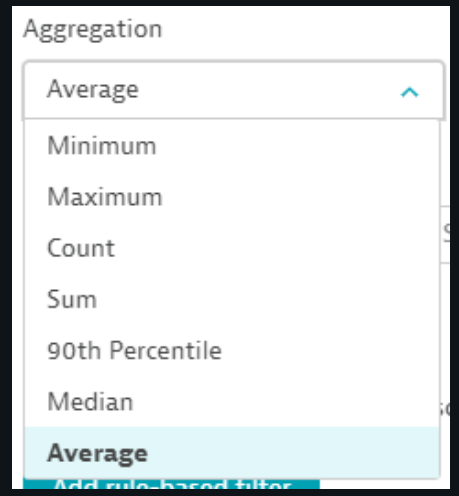


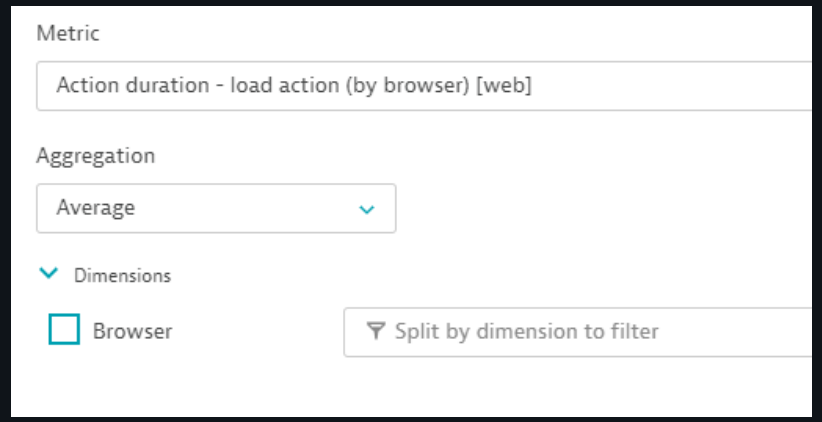




Custom Events – Select Aggregation

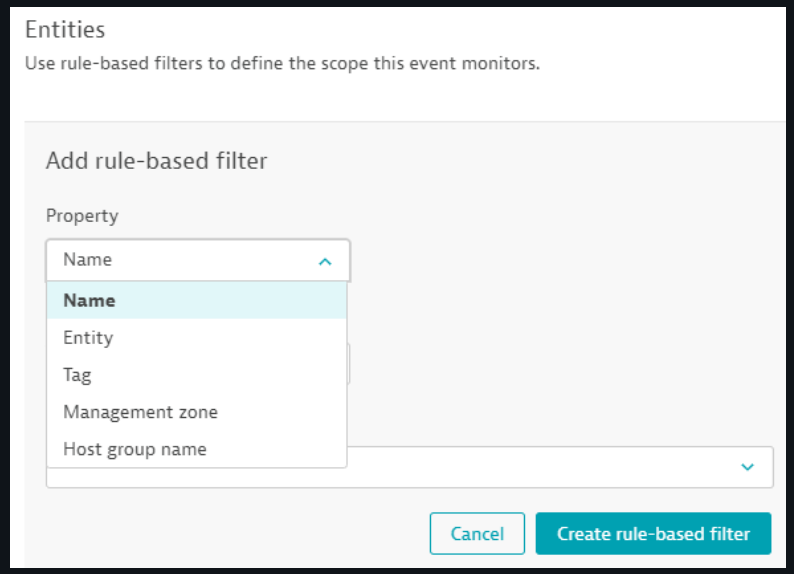
- Select the Aggregation to be use.
  - Metrics may have different aggregations
  - Use the pull-down to see available values
- Some metrics are composed of multiple dimensions. You can select what dimensions and values should be considered for the event.

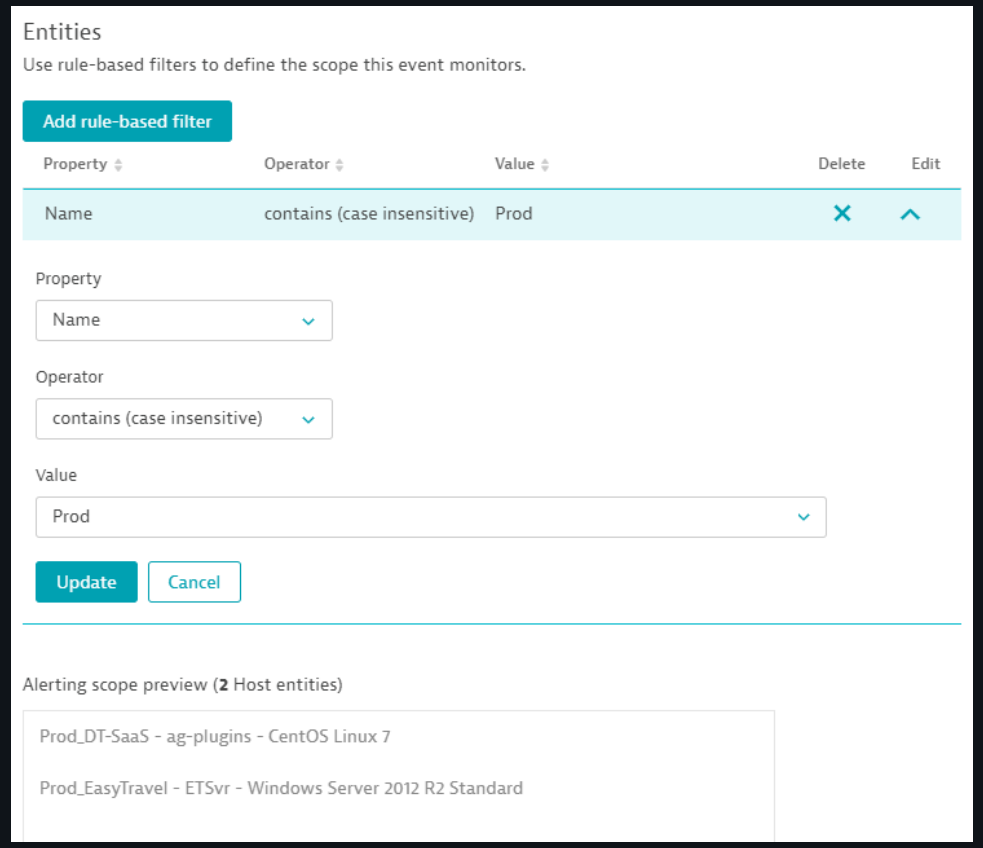




Custom Events – Filter the Entities

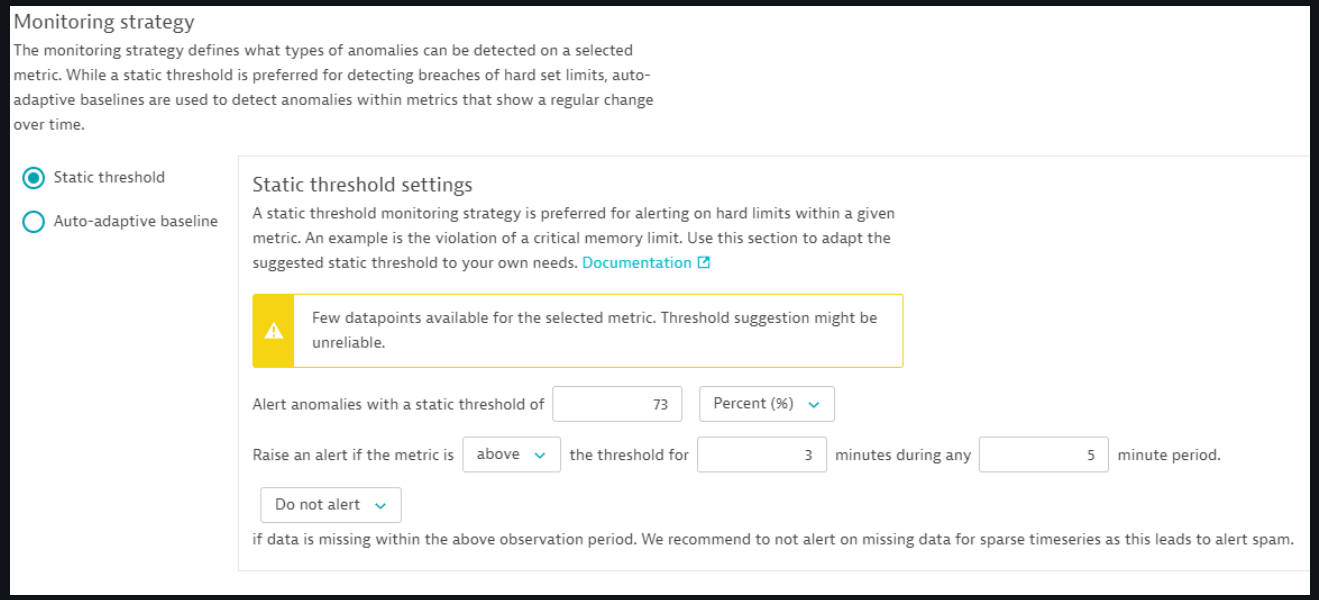
- Add a rule-based filter to limit the scope, or entities, the event will apply to.
- Once the rule is saved the Alerting Scope Preview will update.

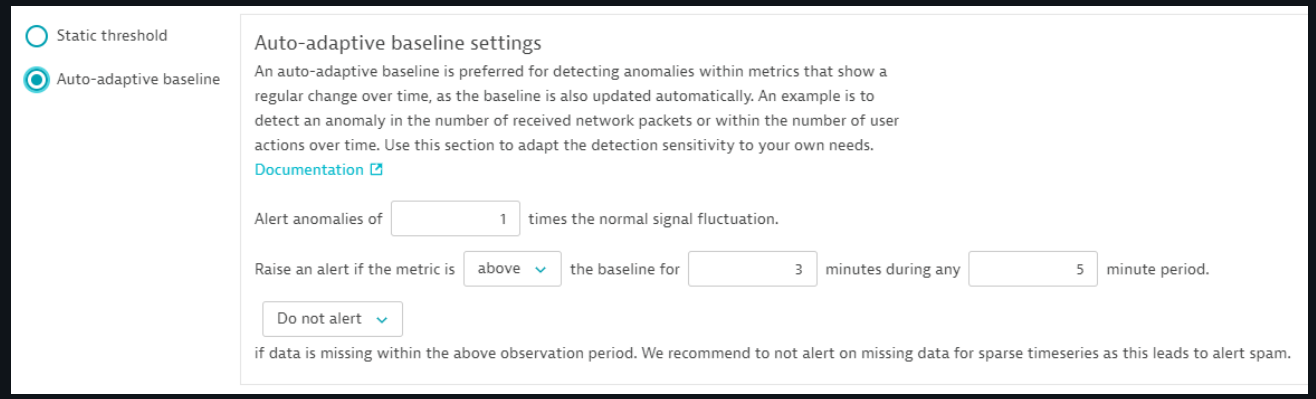




Custom Events – Select a Monitoring Strategy

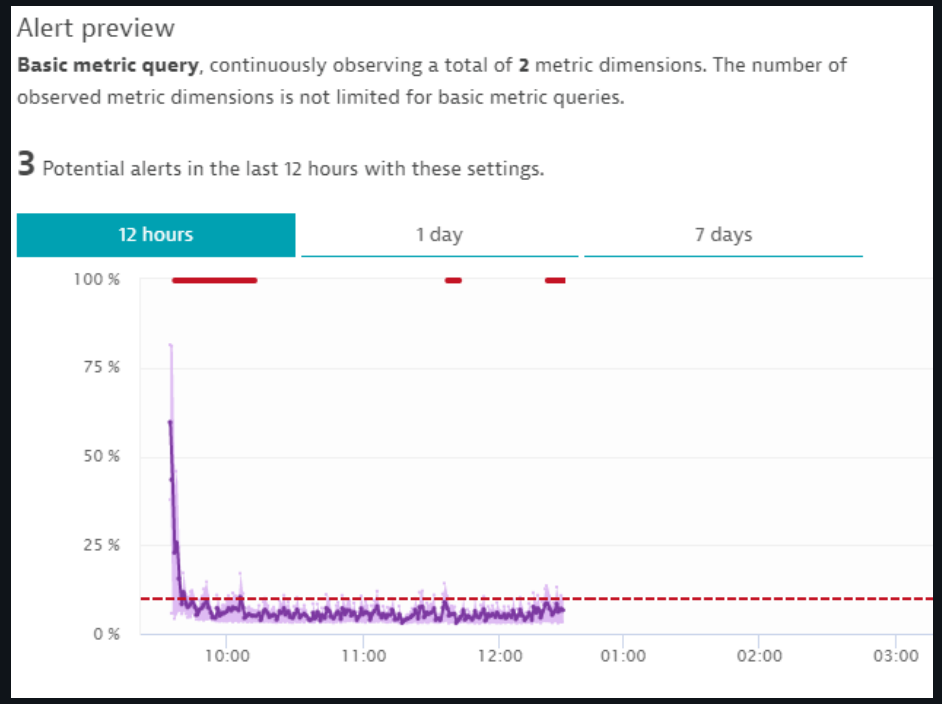
- Select a threshold
  - Static threshold—threshold that doesn't change through time. Dynatrace suggests a value based on the previous data.
  - Auto-adaptive baseline—Automatically calculated threshold that adapts dynamically to your metric's behavior. Select how many times the signal fluctuation is added to the baseline.
- Specify a sliding window for comparison
  - Defines how often the threshold must be violated within a sliding window of time to raise an event. Violates do not have to be consecutive.
- Choose the missing data alert behavior. If enabled, it is combined with the baseline/threshold condition by the OR logic.





Custom Events – Preview

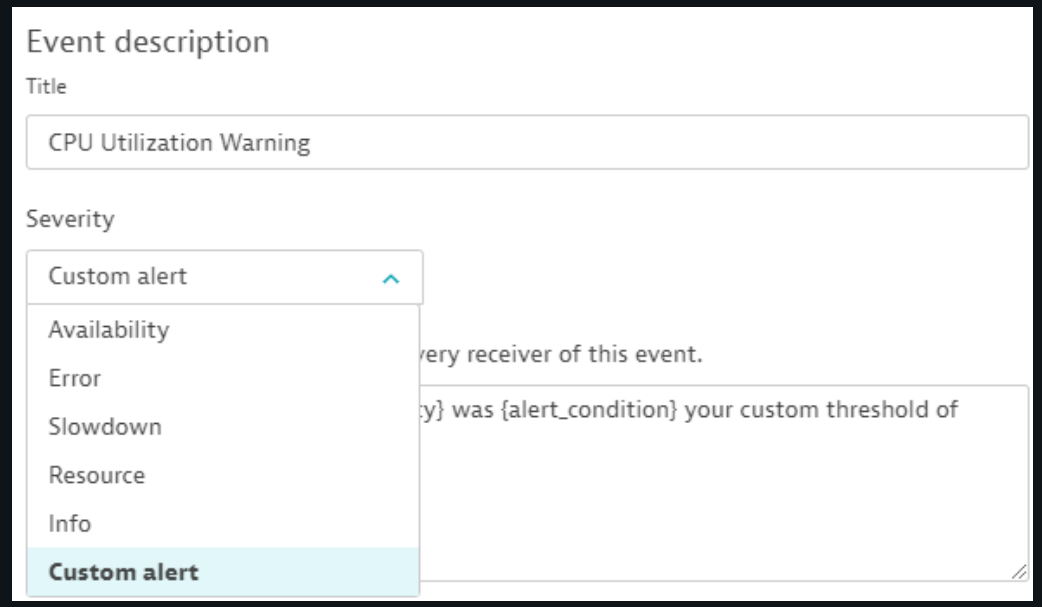
- Utilize the preview to see when the event would be created given the configuration.
- Different timeframes can be selected.
- Red bars appear at the top of the chart if an event would have been generated.



Custom Events – Preview and description

- Select a title for your event. The title should be a short, easy-to-read string describing the situation
- In the Event description section, create a more detailed message. The following placeholders can be used: {metricname}, {severity}, {alert_condition}, {missing_data_samples}, and {baseline} or {threshold}.
- Severity level is important to configure properly. It determines whether a Problem is also created with the event and if Davis includes it in any analysis.

  https://www.dynatrace.com/support/help/shortlink/metric-events-for-alerting#anchor_severity



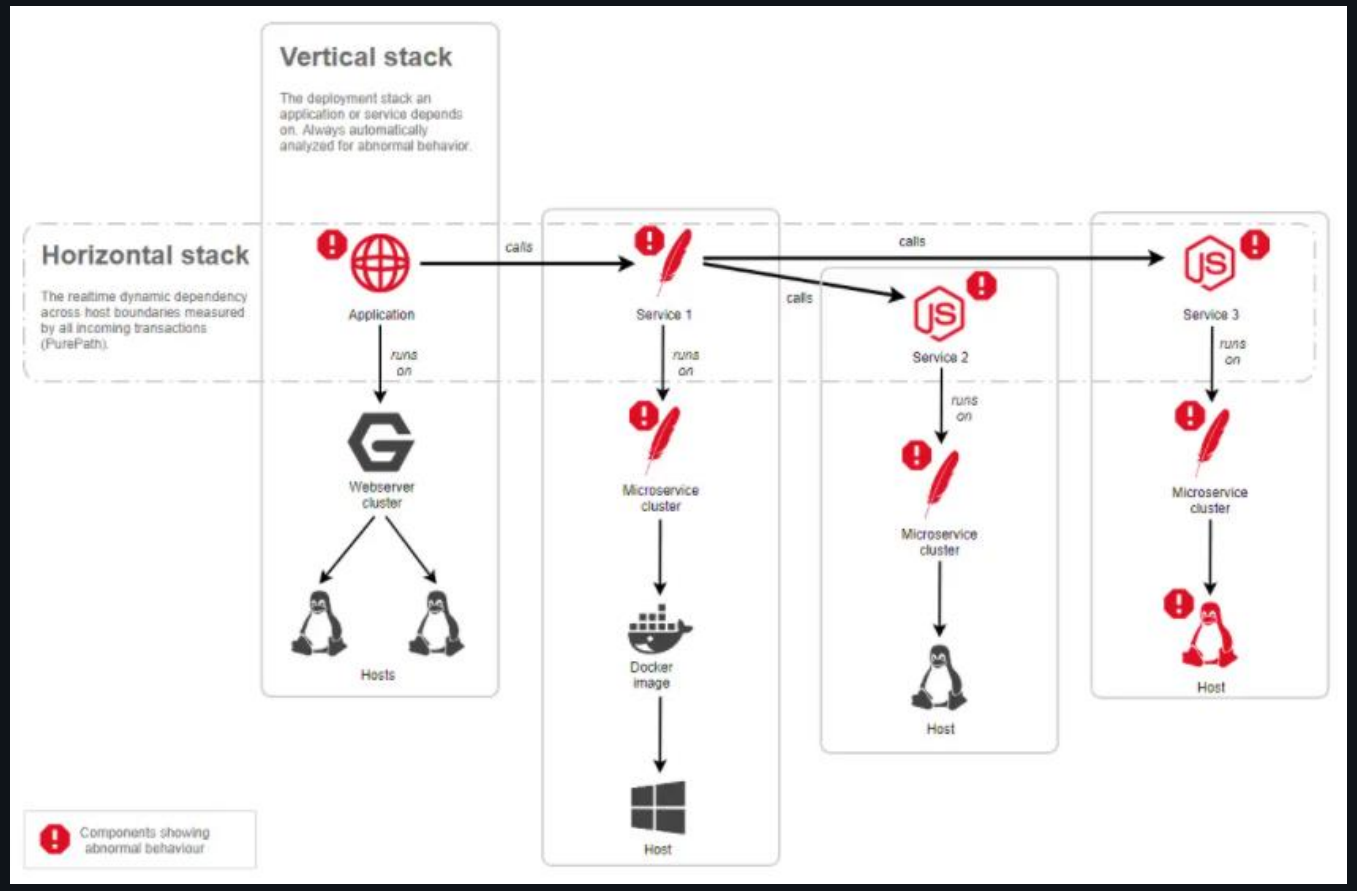
Types of severities

The following types of severities are available.

Severity	Problem raised	Davis analysis	Semantic
Availability	Yes	Yes	Reports any kind of severe component outage
Error	Yes	Yes	Reports any kind of degradation of operational health due to errors
Slowdown	Yes	Yes	Reports a slowdown of an IT component
Resource	Yes	Yes	Reports a lack of resources or a resource-conflict situation
Info	No	Yes	Reports any kind of interesting situation on a component, such as a deployment change
Custom alert	Yes	No	Triggers an alert without causation and Davis AI involved

Problems and Root Cause Analysis

- For each detected Problem, Dynatrace investigates the problem's impact and root cause.
- Dynatrace correlates the sequence of detected events that led up to a problem.
- Dynatrace follows a context-aware approach that detects interdependent events across time, processes, hosts, services and applications.
- Both vertical and horizontal topological monitoring perspectives are analyzed.
- Only through such a context-aware approach is it possible to pinpoint the true root causes of problems.

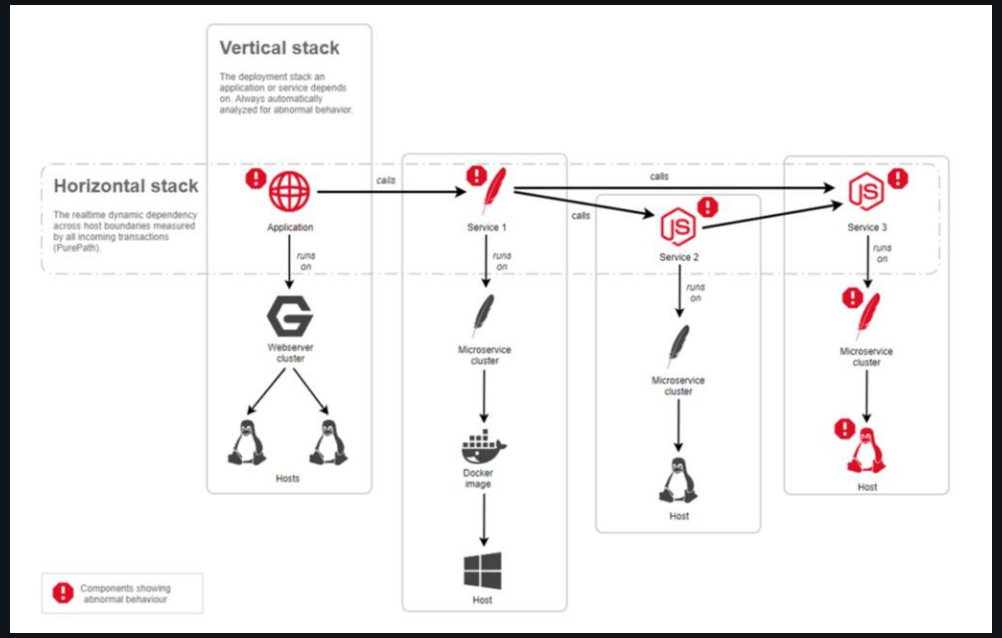


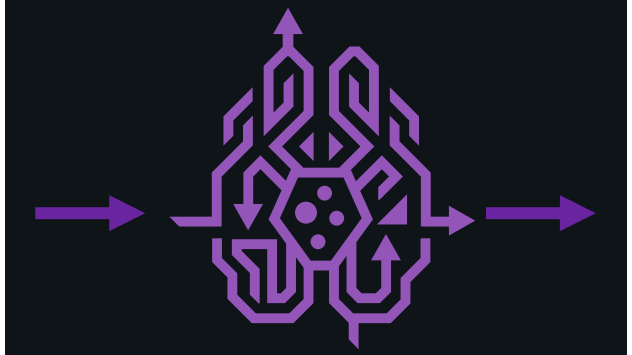
Root cause analysis (RCA)

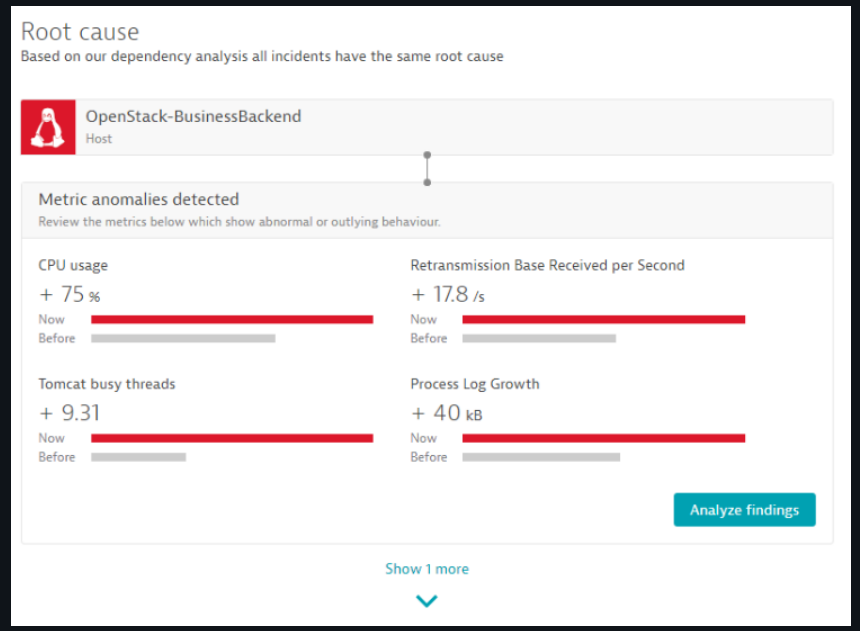
First event is raised, Davis automatically follows all related components

Davis follows transactions and collects evidence, such as events, abnormal states and outlying metrics

Davis presents all findings within root-cause section





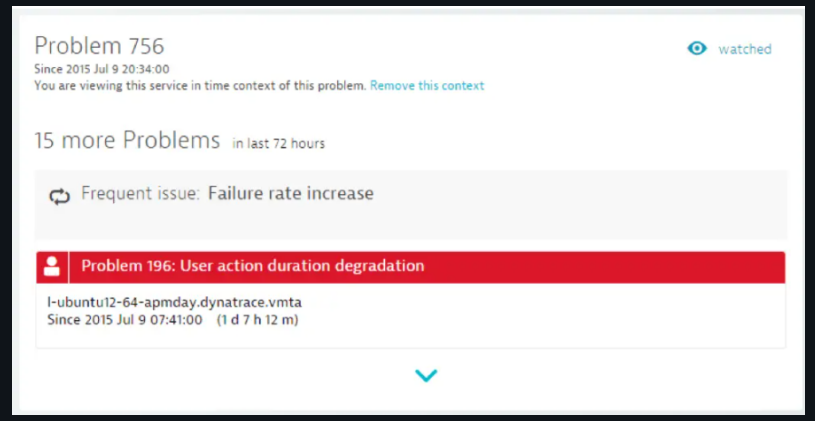


Frequent Issues

Frequent Issues

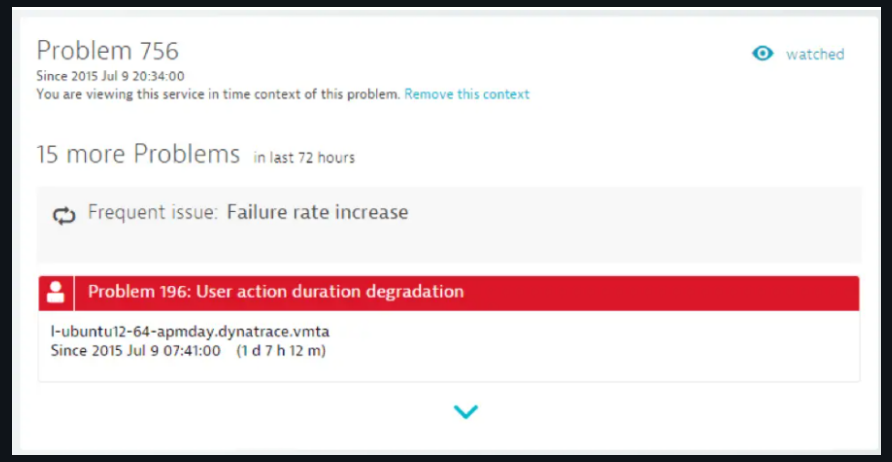
- Problems may come from components or machines that are not critical, thereby are not corrected.
- The Dynatrace AI engine automatically detects regularly occurring Problems that originate from sub-optimal conditions.
- Dynatrace reviews the problem patterns of monitored entities within periods of one day and one week.
- When the same problem for an entity is detected multiple times Dynatrace evaluates the problem based on the breach severity and the duration of the problem.
- If the severity or duration increases, compared to past breaches, a new Problem is created. Otherwise, the Problem is considered a Frequent Issue.
- Recuring Problems that are not handled, even on important components, may also be considered Frequent Issues.

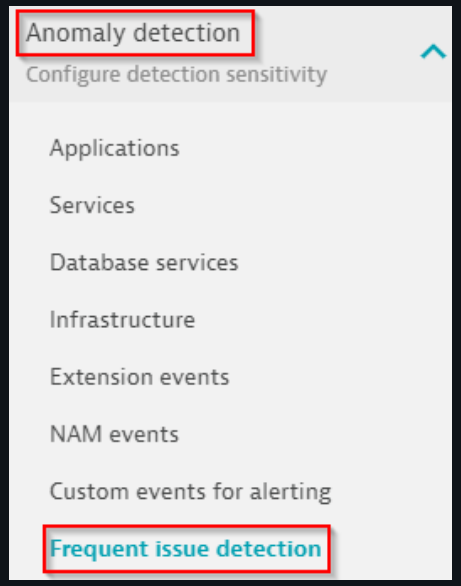
https://www.dynatrace.com/support/help/shortlink/frequent-issues

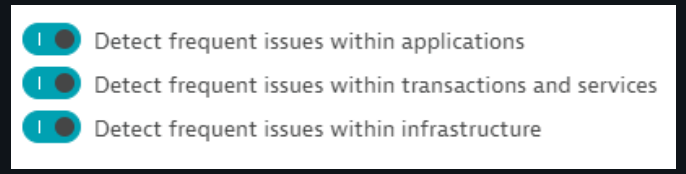


Frequent Issues

- This approach to the detection and handling of frequent issues only alerts for problems that increase in severity over time while avoiding alert spamming.
- Entity overview pages display the frequent issues messages
- Frequent issue detection is configured in Setting->Anomaly Detection->Frequent Issue Detection.
- Frequent issue detection can be configured for Applications, Transactions and Services or Infrastructure







Problem Severity

Problems Severity Types

- Problems aggregate all included events and are evaluated with the highest severity level of the constituent events.
- During its lifespan, a problem might raise its severity level.
  - For example, a problem might begin in slowdown level (3) and then be raised automatically to availability level (1) when an outage is detected.
- Severity types can be used to filter the problem screen
- Severity types are used as filters in alert profiles

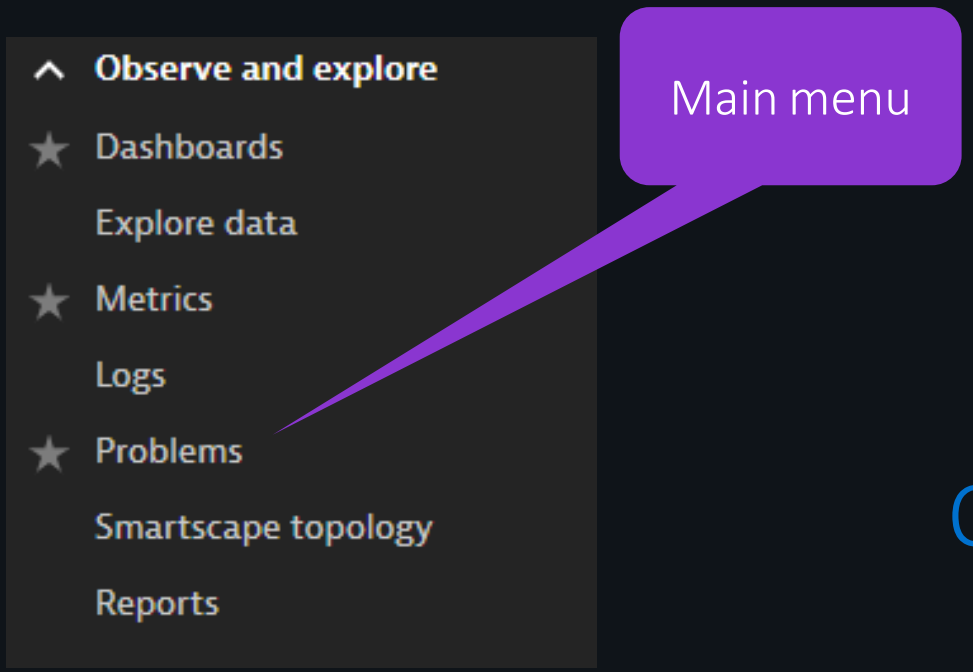
https://www.dynatrace.com/support/help/shortlink/event-types

Problems Severity Types

- Availability (Severity 1)
  - Indicates if a resource may be unavailable by detecting low traffic, host monitoring or process availability, synthetic outages, or custom metrics configured with an availability severity.
- Error (Severity 2)
  - Informs of increased error rates or error-related incidents such as javascipt or service failures, mobile app crashes, network interface errors or custom metrices configured with an error severity.
- Slowdown (Severity 3)
  - Indicates an increase of response time for applications, services, databases, synthetics or custom metrics configured with a slowdown severity.
- Resource (Severity 4)
  - Indicate resource contention such as CPU or memory saturation, unexpected high traffic, low disk space, increased GC time or custom metrics configured with a resource severity.
- Custom (Severity 5)
  - Used for user-defined thresholds on metrics. Custom severity events are not correlated by Davis.
- Info (Severity 6)
  - Indicate events that don't result in the creation of a new problem, Java Framework changes, deployments or VMotions.

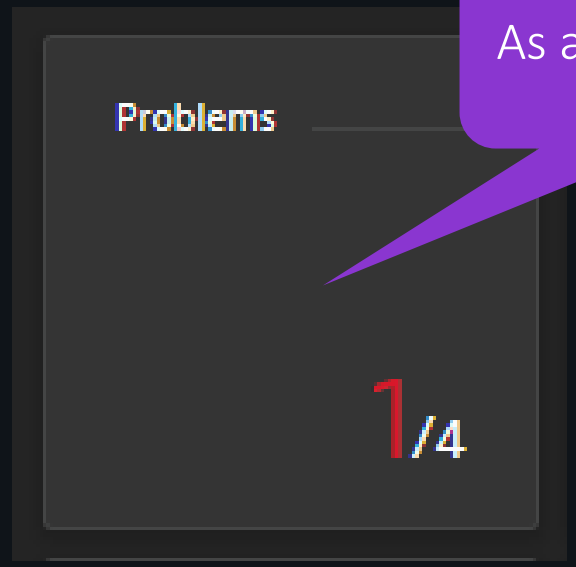
Problems Overview Page

How do I access Problems?

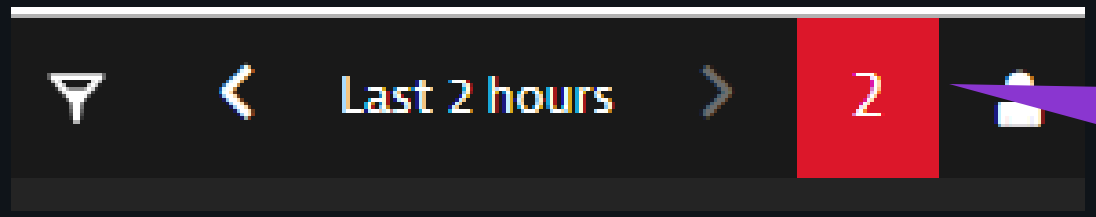


Main menu

OR



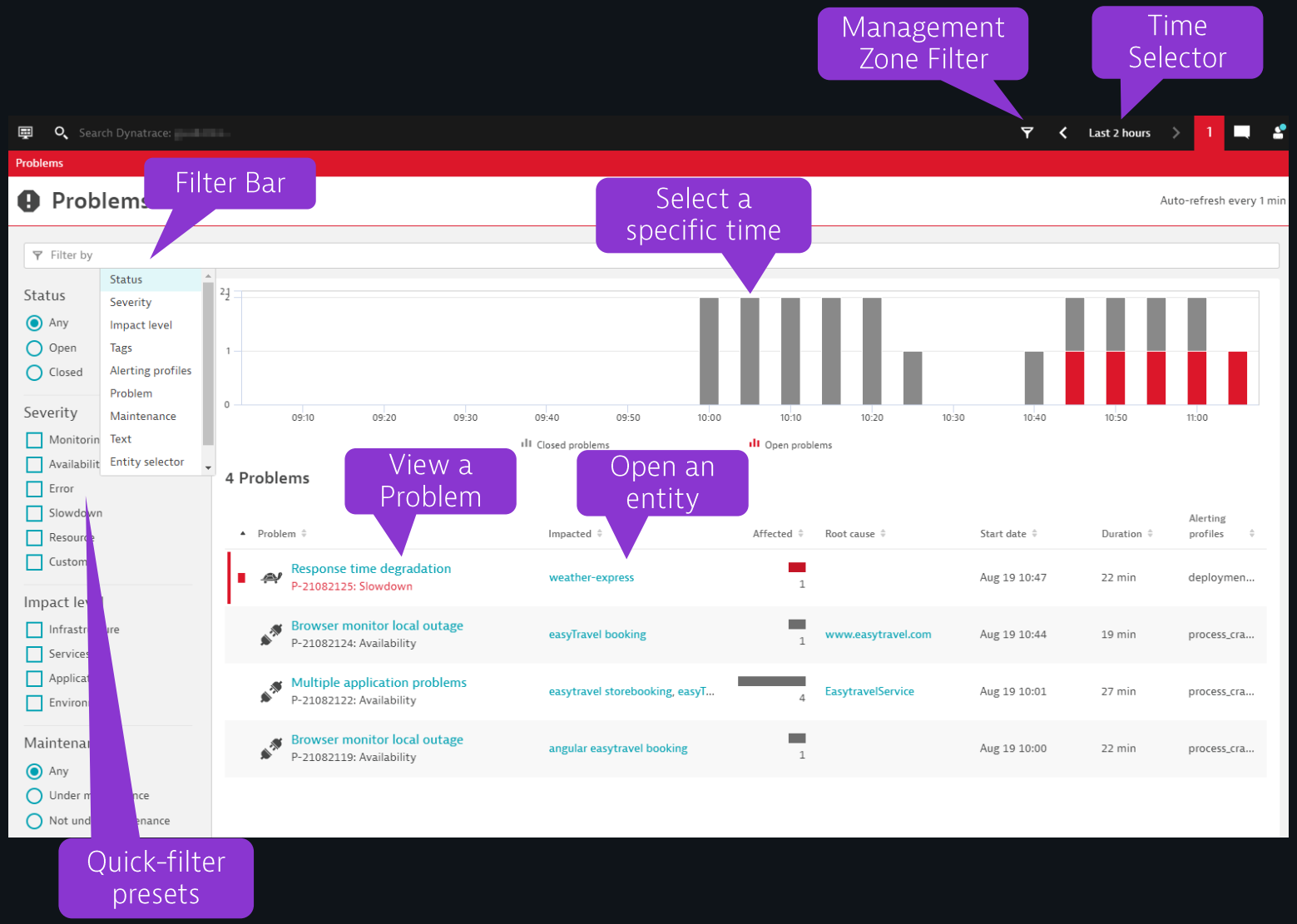
As a dashboard tile



On the top menu

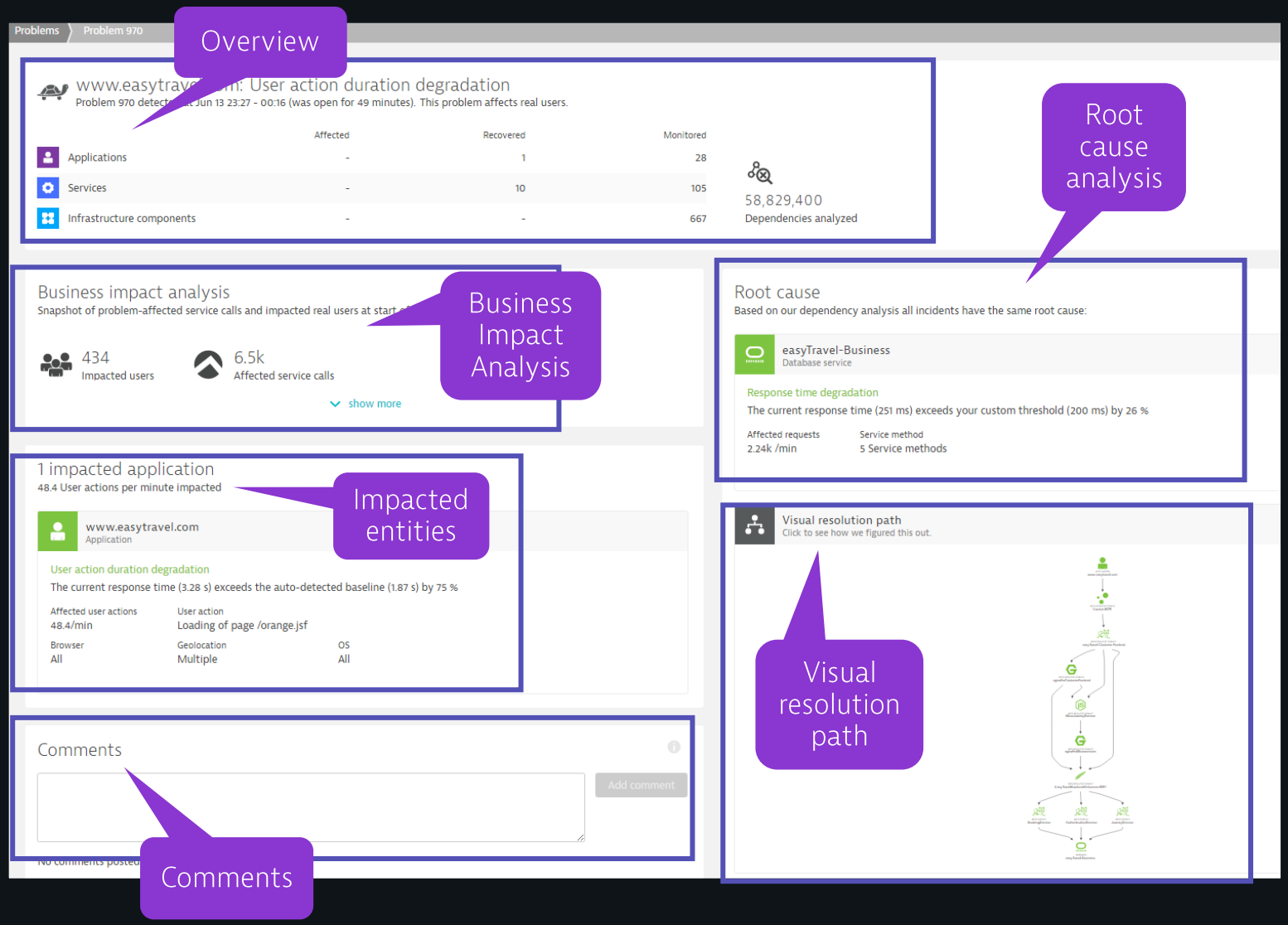
Problems Overview Page

- Once the Problems feed is open several options are available to refine the view or navigate.
- Use the time selector to view problems over a given timeframe.
- Click on a specific column in the graph to filter on that time
- Filter the view
  - Using the quick-filter presets
  - Select Filtering options in the top filter bar
  - Select a Management Zone
- Open a problem by clicking on the problem description
- Go right to an entity by clicking on the "impacted" entity column
- The view updates every minute



Aspects of a Problem

- Several sections will display information about the selected problem.
- Start with Root Cause or the Impacted entity
  - Look for drill-downs to analyze failures or performance degradations.
- Open the entity in the "Impacted section"
  - Navigating to an impacted entity will set the Time Control to the time from the problem card.
- Visual resolution path will play through the events of the problem
- Open problems may evolve and change as Davis relates additional events to the problem



https://www.dynatrace.com/support/help/shortlink/problem-overview-page

Alert Profiles

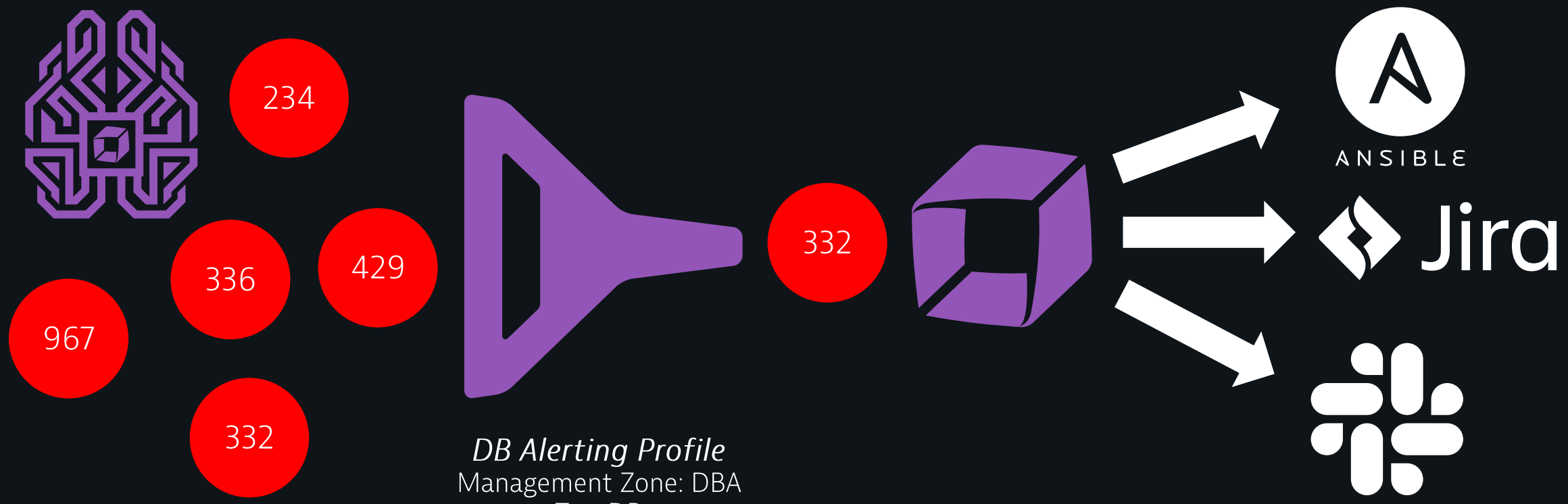
Alert Profiles

- Alert Profiles simply filter the full list of Problems.
- Alert Profiles are also the filtering mechanism for Problem Notifications
- By combining filter criteria, you can create custom profiles that filter Problems based on:
  - Management Zones
  - Severity
  - Tags
  - How long a problem has been open
  - Problems Titles or Descriptions
  - Specific event types

https://www.dynatrace.com/support/help/shortlink/alerting-profiles

Alert Profiles

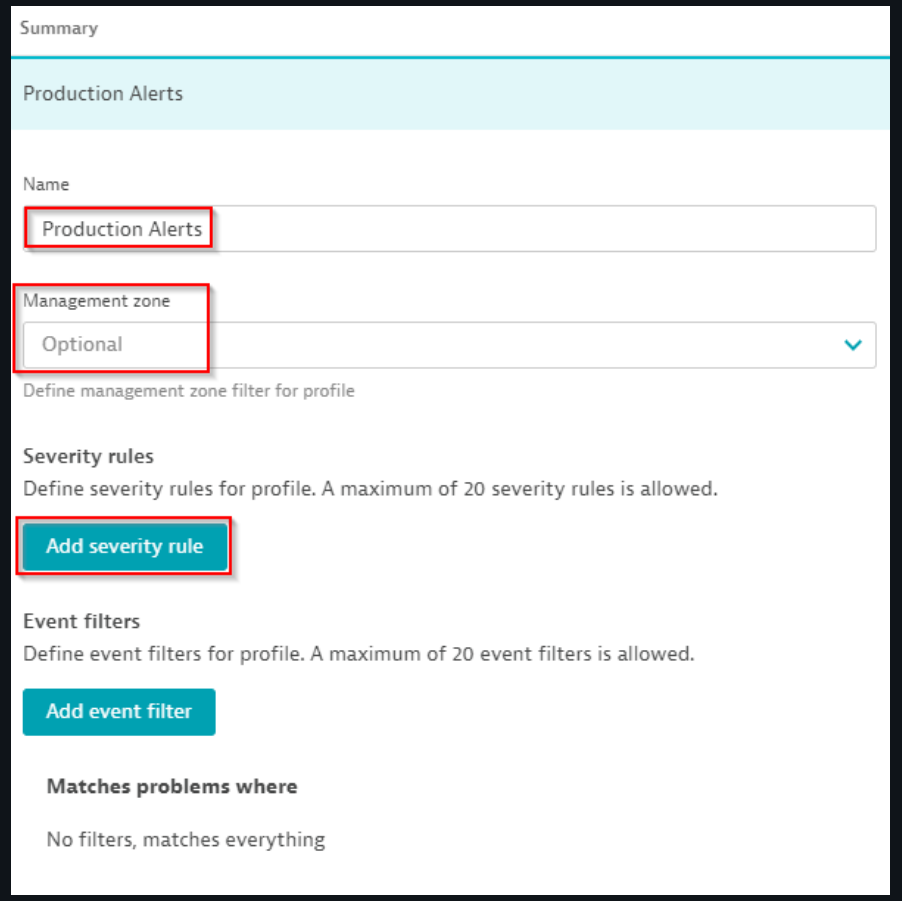
- Alerting profiles serve as a filter when deciding to send out a problem notification



DB Alerting Profile
Management Zone: DBA
Tag: DB
Severity: Error
Duration: 30 Mins

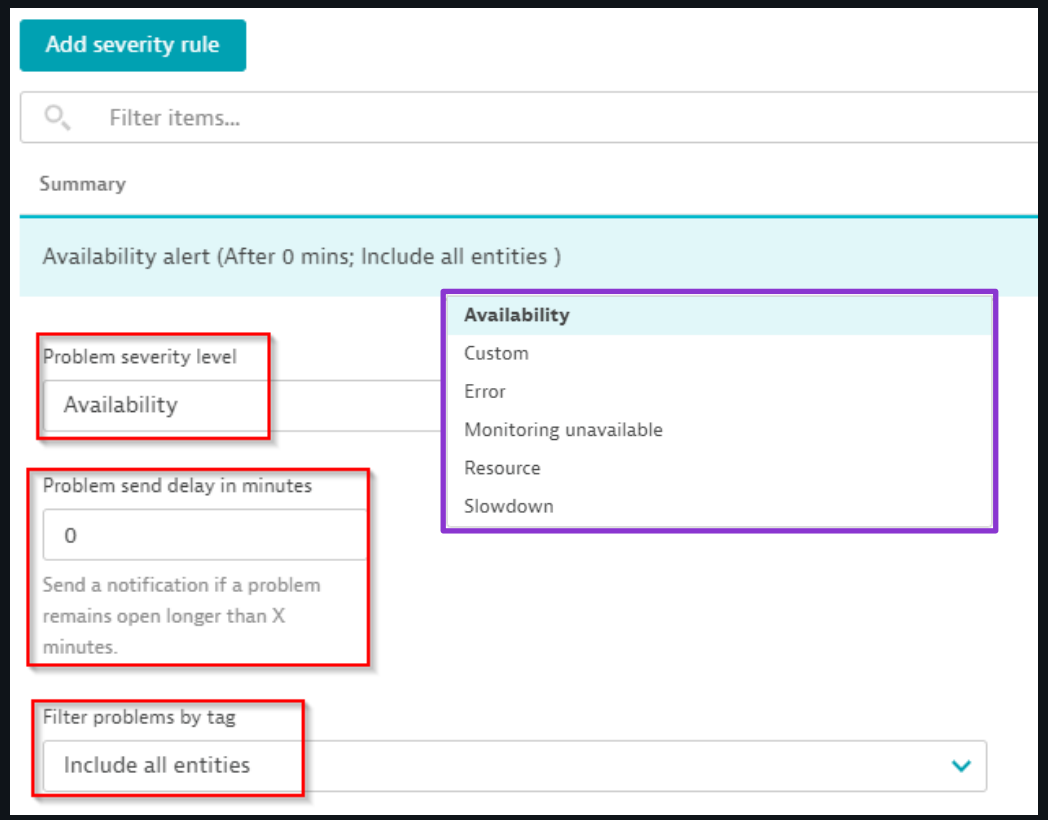
Alert Profiles

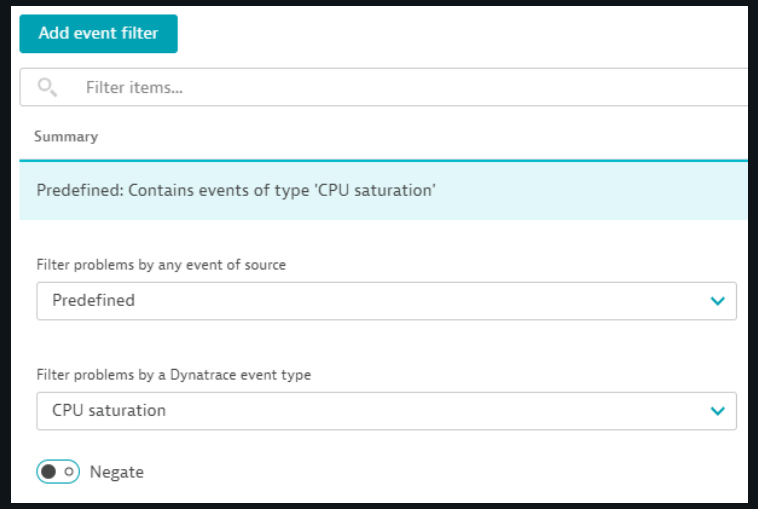
- To create an Alert Profile go to Settings->Alerting->Alerting Profiles and click “Add Alerting Profile”
- Provide a descriptive name for the profile
- Select a Management Zone, which perhaps the easiest way to create a profile and is highly recommended.



Alert Profiles

- Add one or more severity rules to the profile
- Specify how long the problem must be open before it is included in the profile.
- Further refine the rule by tag if necessary.
- Add event filters to filter for a specific event type. If the event types is not present in the problem, it will not be included in the profile.

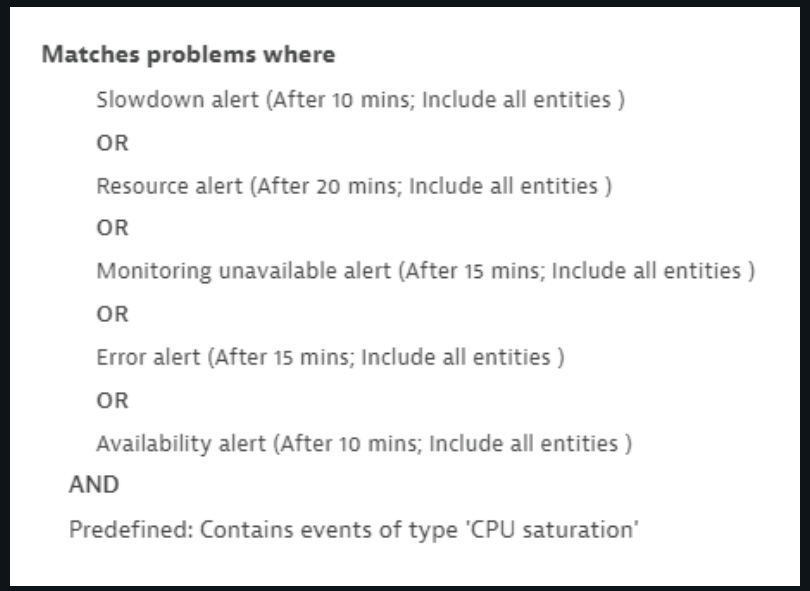


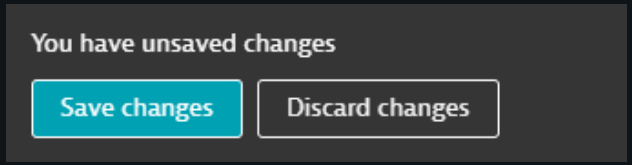


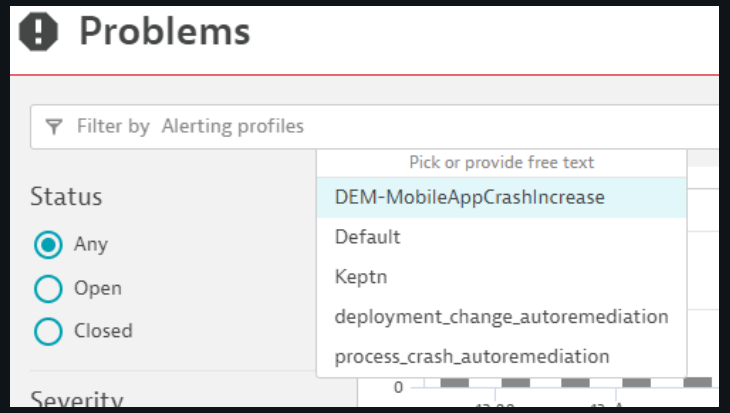
Alert Profiles

- Use the preview logic at the bottom of the alert definition to review what problems would be included in the profile.
- Save the changes when complete.

- Alert Profiles can also be used to filter the Problem Feed







Notifications

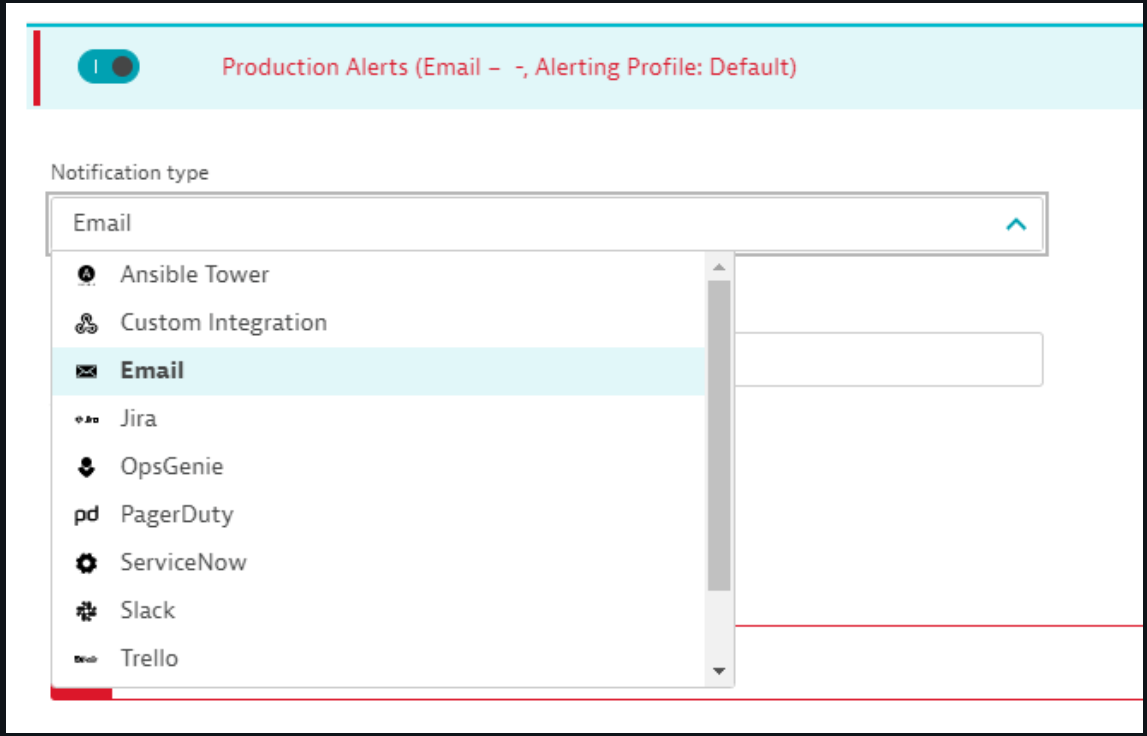
Problem Notifications

- Dynatrace enables the automatic push of problem notifications to third-party incident management or ChatOps services.
- Notifications are configured to use an Alert Profile to filter Problems.
- Open Problems are continuously updated based on correlated events.
- To avoid notification spam, problem notifications are only pushed to third-party systems when problems are initially detected and when they are resolved.
- Additional configuration may be necessary depending on the type of notification integration.
- An email integration or webhook integration might be used if Dynatrace doesn't yet offer an out-of-the-box integration for a specific system

https://www.dynatrace.com/support/help/shortlink/third-party-integrations-hub#problem-notification

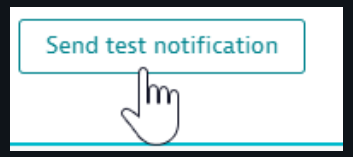
Notifications

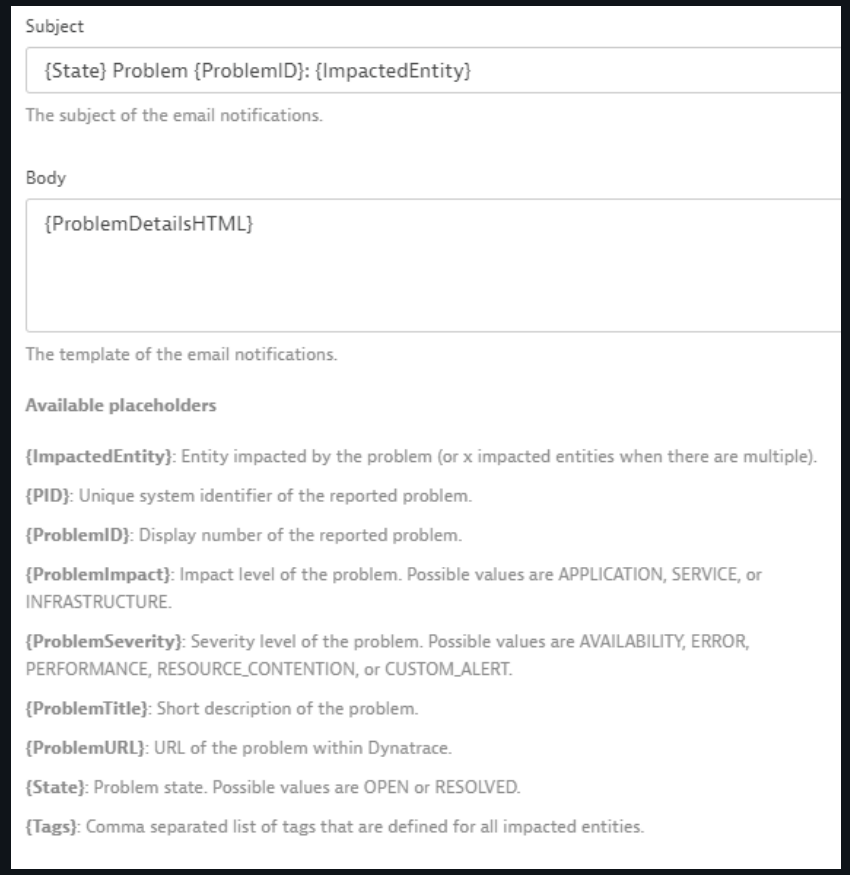
- To create a Notification Integration open Settings->Integration->Problem Notifications and click “Add Notification”
- Select the Notification Type
- Provide a descriptive name for the profile
- Fill in the details for the integration
- Follow the instructions for any additional setup that may be needed: https://www.dynatrace.com/support/help/shortlink/third-party-integrations-hub

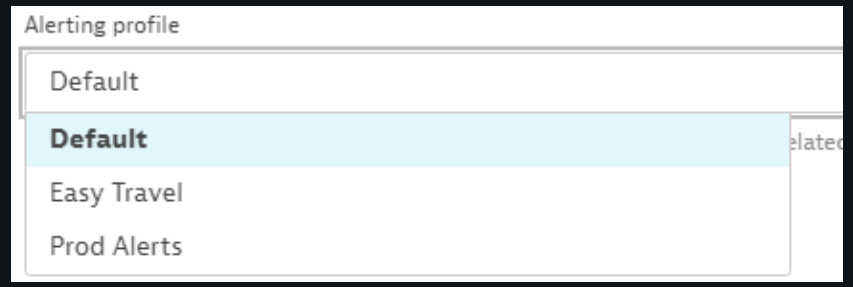


Notifications

- Customize the information sent to the notification.
  - Placeholders and typed text can be used to customize the message.
- Select the Alerting Profile to use for the notification.
- Be sure to "Send a Test Notification" to ensure the configuration is correct.







Maintenance Windows

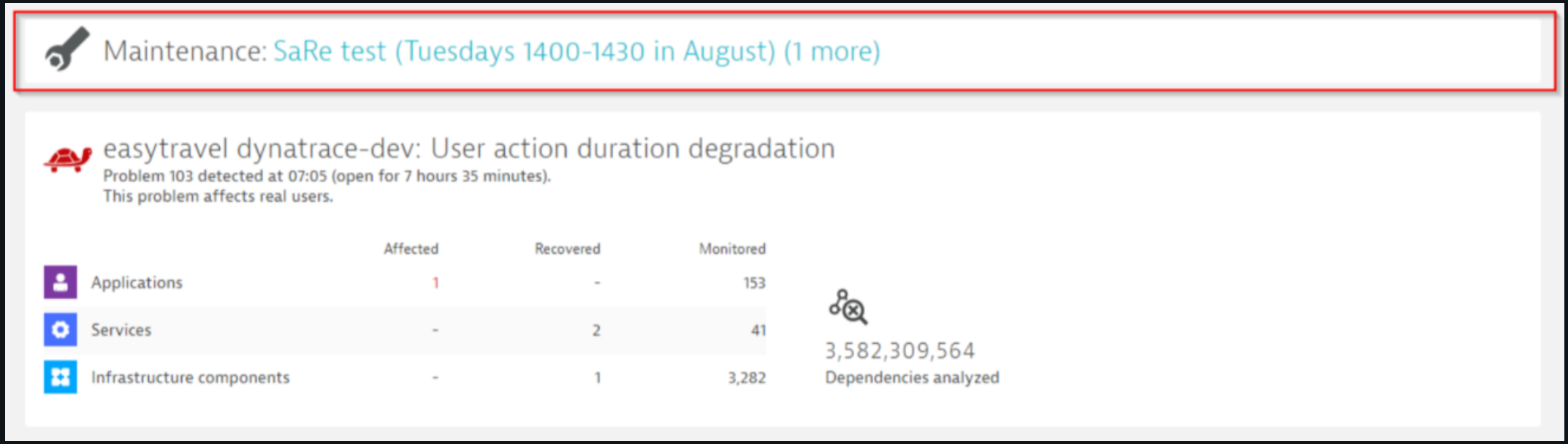
Maintenance windows

- Maintenance Windows can be defined in advance or retroactively
  - In Advanced for regularly scheduled maintenance periods
  - Retroactively for ongoing outages or emergency releases
- Metrics collected during a maintenance window do not become part of the baselines
- Problem handling can be defined
  - If problems are created, the problem card will have a wrench and bolt
- Maintenance windows can be used to stop synthetics
- Maintenance windows can be created for OneAgent updates

https://www.dynatrace.com/support/help/shortlink/maintenance-window

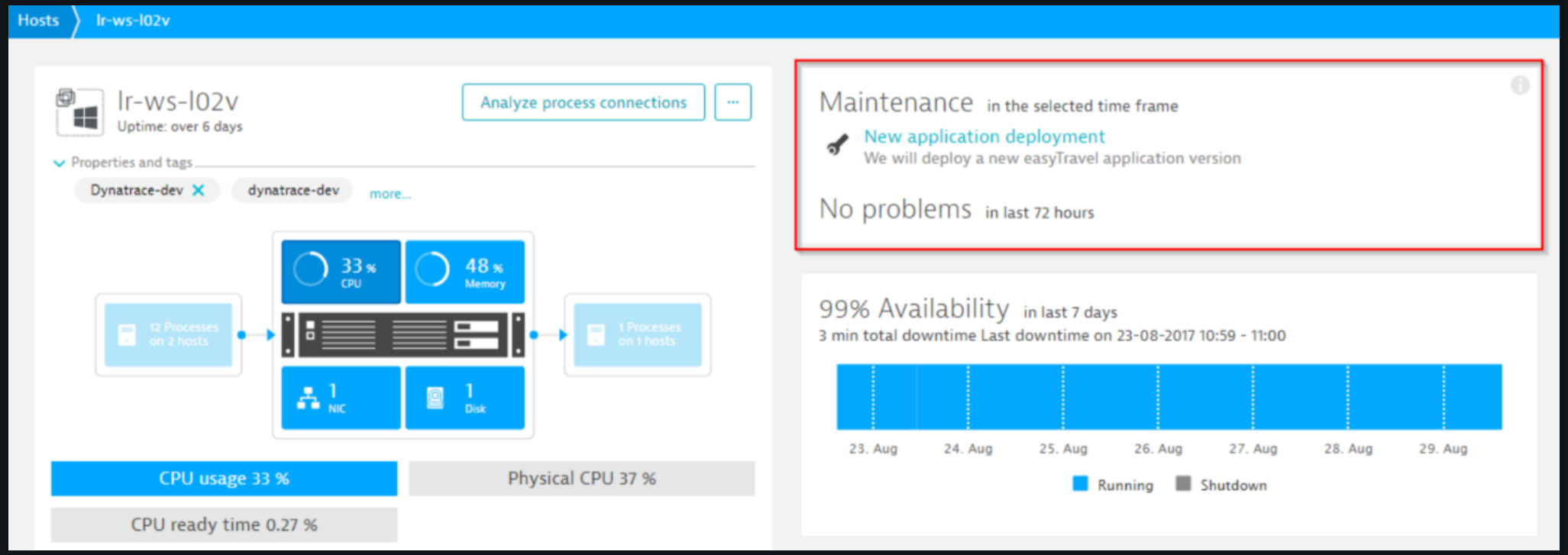
Maintenance Windows

- If you open a problem that occurred during a maintenance window, Dynatrace shows a header on the Problem page



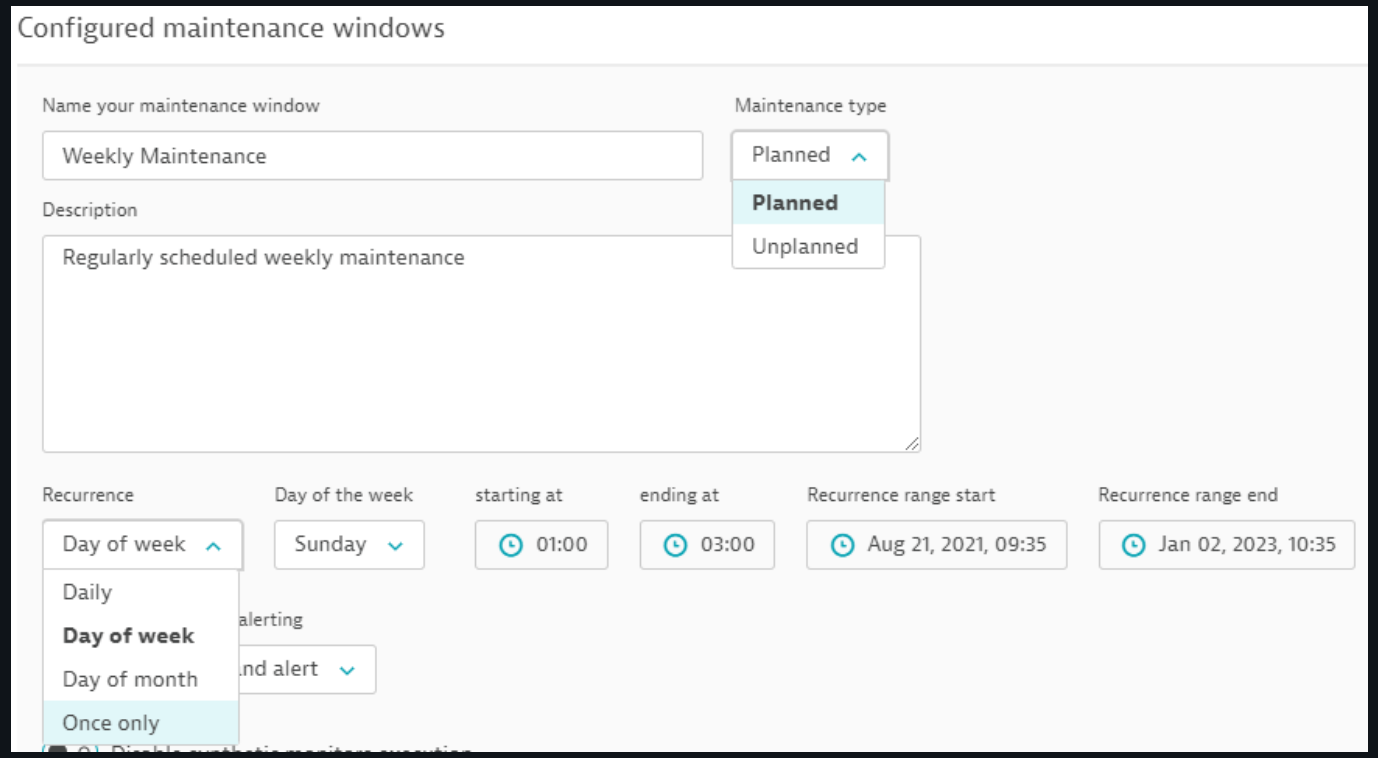
Maintenance Windows

- Even if you aren't within a problem context and you select a timeframe in which a selected host was under maintenance, Dynatrace shows you the details on the Maintenance tile



Maintenance windows

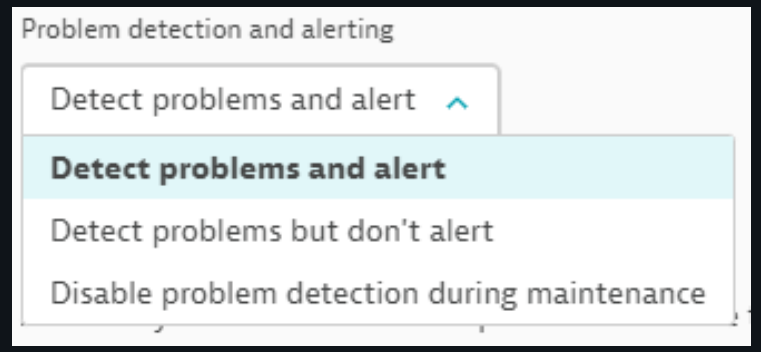
- To create a maintenance window open Settings -> Maintenance Windows -> “Monitoring, alerting and availability” and click “Create a Maintenance Window”
- Add a Name, Type and Description
- Select the schedule for the window
  - the actual time for the maintenance window
  - the dates it is in effect.

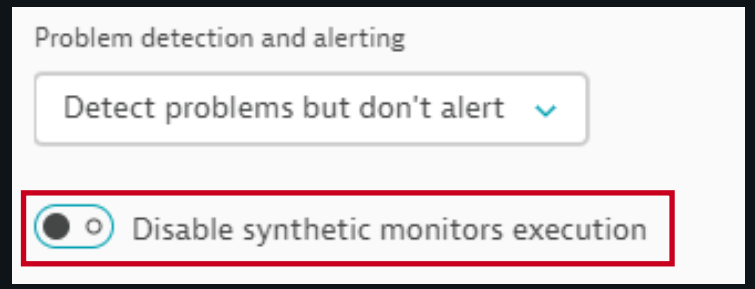


https://www.dynatrace.com/support/help/shortlink/maintenance-window-define

Maintenance windows

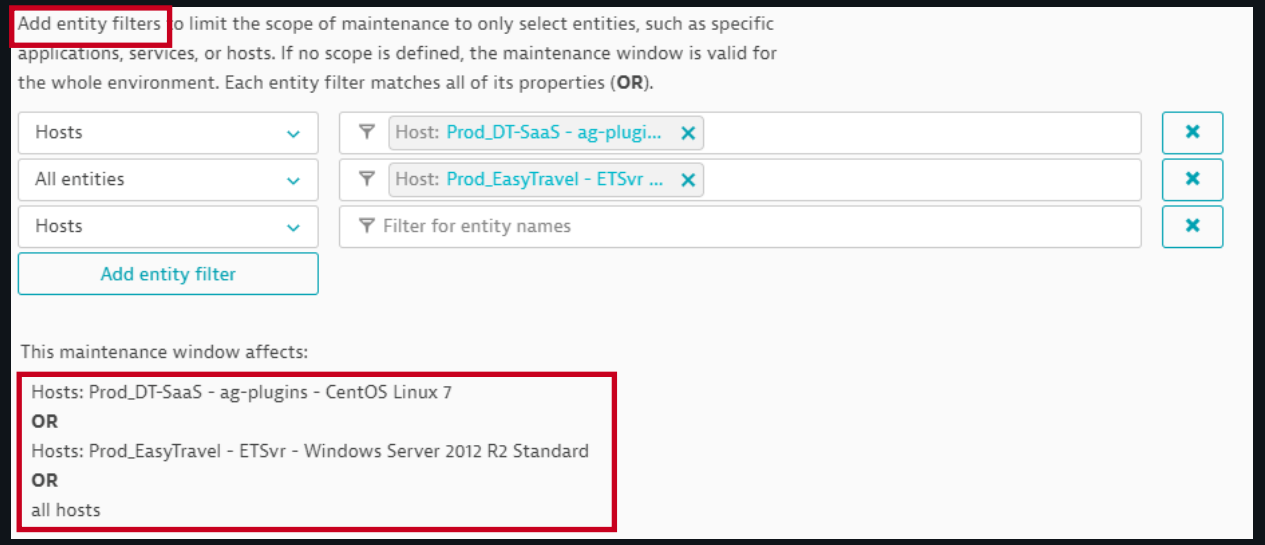
- Select how Problems will be handled.
  - Detect problems and alert: Problems are detected as usual. A maintenance window icon is displayed on the problem.
  - Detect problems but don't alert: Problems are detected but no notification is sent. A maintenance window icon is displayed on the problem.
  - Disable problem detection: Dynatrace will not detect problems or send out alerts for them.
- Select whether synthetics monitors (Browser or HTTP) should be executed during the maintenance window.
  - To only disabling Synthetic Monitors the scope must include the monitors in the entity and/or tag filters.
  - Execution will be disabled only for the matching synthetics.

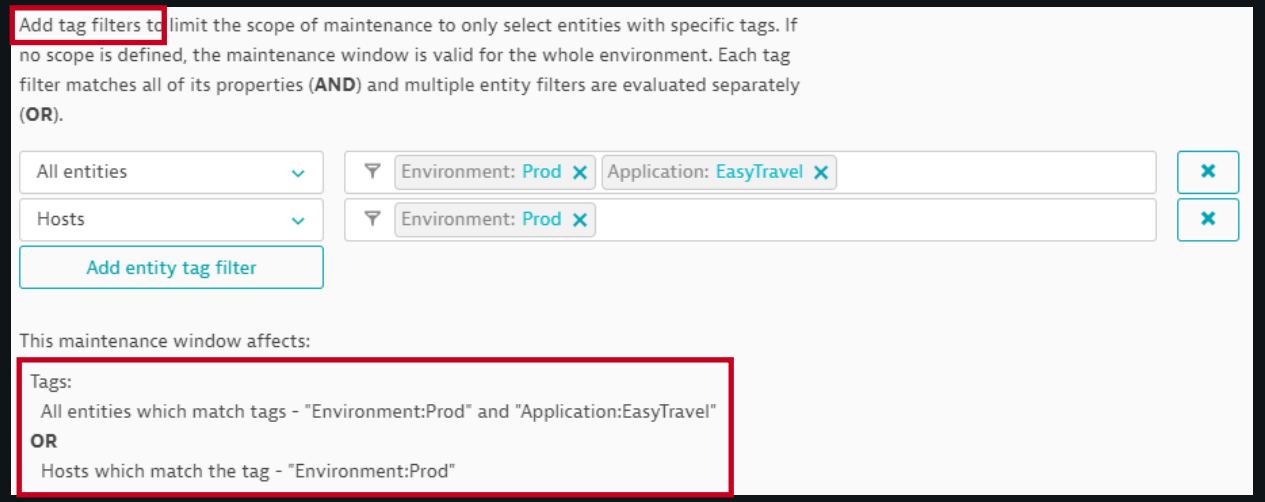




Maintenance windows

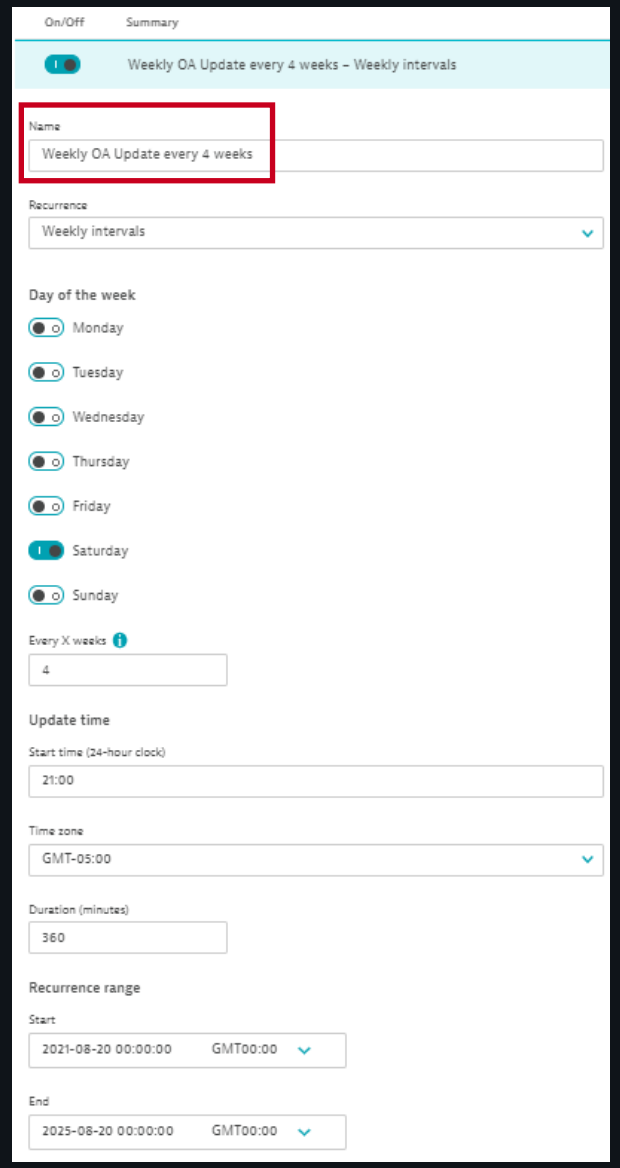
- By default, a maintenance window applies to the entire environment.
- Entities Filter – add if needed
  - Select the type of entity to be included in the Maintenance Window.
  - Narrow the list by selecting a specific entity names. These will be applied using and "OR" logic.
- Tags Filter – add if needed
  - Select an entity type if needed or use all entities.
  - Select the tag and/or value to filter against. Multiple tags on the same line are applied using "AND" logic.
- Use the Preview to see what would be included in the Maintenance Window.
- Save the changes when complete

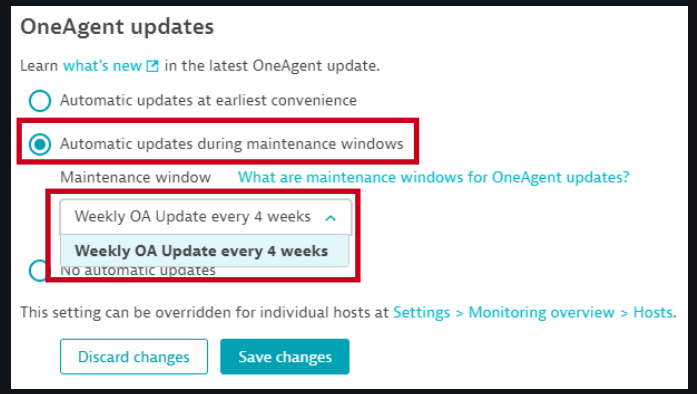




Maintenance windows

- OneAgent Maintenance Windows are used in conjunction with the OneAgent update option.
- First – create a OneAgent Maintenance Window at Settings -> Maintenance Windows -> OneAgent Updates
- Specify the options and save the changes when complete.
- Select the Maintenance window in the update options at Settings -> Preferences -> OneAgent Updates.
- Save the changes when complete.





Questions?

dynatrace

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