AppDynamics Concepts

Related pages:
- Flow Maps
- SaaS Domains and IP Ranges
- Tiers and Nodes

This page introduces you to the AppDynamics Application Performance Management (APM) Platform.

About the AppDynamics APM Platform

The AppDynamics APM Platform enables you to monitor and manage your entire application-delivery ecosystem, from the mobile app or browser client request through your network, backend databases and application servers and more.

AppDynamics APM gives you a single view across your application landscape, letting you quickly navigate from the global perspective of your distributed application right down to the call graphs or exception reports generated on individual hosts.

Application Performance Monitoring

At the tier level, AppDynamics gives you a view of the runtime operation of your code via an AppDynamics App Server agent. The agent detects calls to a service entry point at the tier and follows the execution path for the call through the call stack. It sends data about usage metrics, code exceptions, error conditions, and exit calls to backend systems to the Controller, either a SaaS or on-premises:
To get started with application monitoring, see Install App Server Agents.

Most application environments consist of more than a single application server. They may contain multiple, distributed, and interconnected servers and processes that participate in fulfilling a given user request. In this context, AppDynamics tracks transactions across distributed, heterogeneous services.

**Infrastructure Visibility with Database Visibility**

For greater visibility into your application delivery environment, you can add AppDynamics Database Visibility to the deployment.

App agents can tell you about calls to backend databases, including errors and call counts. The Database Visibility module extends that visibility to the workings of the database server itself. It gives you detailed information on query execution and performance, with an agent-less profile.

AppDynamics Server Visibility adds to your view of the data center, with precious information on the performance of the machines and networks in your environment.
In this deployment, the database agent collects information from the database servers and sends it to the Controller, which persists some of that information in the Events Service. Database analytics features may use the Events Service, the document storage component of the platform that AppDynamics has optimized for searching and storing high volumes of information.

**End User Monitoring for Client Experience**

While server-side monitoring can tell you a great deal about how end users experience your application's performance and especially how to improve that performance from the server side, end-user monitoring can extend that insight all the way from the initial client request through to the response on the client device. With AppDynamics End User Monitoring, you can collect information on where in the world your requests are coming from and what devices and channels your users are using, as well as the performance of your code once it's on your users' devices. You can even investigate mobile crashes by seeing stack traces and other contextual data at the moment of the crash, and AppDynamics can tie that data to business transaction data from the server side.

**Business iQ and Application Analytics for Business Impact**

How does the overall performance of your application environment affect your business? Business IQ, powered by AppDynamics Application Analytics, can help you understand how the performance of your application environment and end-user applications ties to the business data of the transactions. It lets you sort, order, and understand the data that compose the business transactions. It also enables you to drill into the varieties of log data that your environment generates. See Using Application Analytics Data for information about how to install and use application analytics.

**Using Metrics**
A metric is a particular class of measurement, state, or event in the monitored environment. Many defaults relate to the overall performance of the application or business transaction, such as request load, average response time, or error rate. Others describe the state of the server infrastructure, such as percentage CPU busy or percentage of memory used.

Agents register the metrics they detect with the Controller. They then report measurements or occurrences of the metrics (depending on the nature of the metric) to the Controller at regular intervals. You can view metrics using the Metric Browser in the Controller UI.

Information points are a particular type of metric that enables you to report on how your business (as opposed to your application) is performing. For example, you could set up an information point to total the revenue from the purchase on your website of a specific product or set of products. You can also use information points to report on how your code is performing, for example, how many times a specific method is called and how long it is taking to execute.

You can create extensions that use the machine agent to report custom metrics that you define. These metrics are base-lined and reported in the Controller, just like the built-in AppDynamics metrics.

As an alternative to using the Controller UI, you can access metrics programmatically with the AppDynamics APIs.

**Baselines and Thresholds**

The AppDynamics Platform uses both self-learned baselines and configurable thresholds to help identify application issues. A complex distributed application has a large number of performance metrics, and each metric is important in one or more contexts. In such environments, it is difficult to:

- Determine the values or ranges that are normal for a particular metric
- Set meaningful thresholds on which to base and receive relevant alerts
- Determine what is a ‘normal’ metric when the application or infrastructure undergoes change

For these reasons, anomaly detection based on dynamic baselines or thresholds is one of the essential features of the AppDynamics platform.

The AppDynamics platform automatically calculates dynamic baselines for your metrics, defining what is ‘normal’ for each metric based on actual usage. Then the platform uses these baselines to identify subsequent metrics whose values fall out of this normal range. Static thresholds that are tedious to set up and, in rapidly changing application environments, error-prone, are no longer needed.

You can create health rules with conditions that use baselines, allowing you to trigger alerts or kick off other types of remedial actions when performance problems are occurring or may be about to happen. See Alert and Respond and Health Rules and Dynamic Baselines for more detail.

AppDynamics thresholds help you to maintain service level agreements (SLAs) and ensure optimum performance levels for your system by detecting slow, very slow and stalled transactions. Thresholds provide a flexible way to associate the right business context with a slow request to isolate the root cause. See Transaction Thresholds.

**Health Rules, Policies, and Actions**

AppDynamics uses dynamic baselining to establish what is considered normal behavior for your application automatically. Then you can set up health rules against those standard baselines (or use other health indicators) to track non-optimal conditions. A health rule might be ‘create a critical event when the average response time is four times slower than the baseline.’

Policies allow you to connect such problematic events (like the health rule critical event) with actions, that can, for example, trigger alerts or remedial behavior, addressing the system’s issues before your users are affected.

AppDynamics supplies default health rules. You can customize the default health rules and create new rules specific to your environment.

The out-of-the-box health rules test business transaction performance as follows:

- **Business Transaction response time is much higher than normal**: Defines a critical condition as the combination of an average response time higher than the default baseline by three standard deviations and a load greater than 50 calls per minute. This rule defines a warning condition as the combination of an average response time higher than the default baseline by two standard deviations and a load greater than 100 calls per minute.

- **Business Transaction error rate is much higher than normal**: Defines a critical condition as the combination of an error rate greater than the default baseline by three standard deviations and an error rate higher than ten errors per minute and a load greater than 50 calls per minute. This rule defines a warning condition as the combination of an error rate greater than the default baseline by two standard deviations and an error rate greater than five errors per minute and a load greater than 50 calls per minute.

For more information, see Alert and Respond.
Infrastructure Monitoring

While business transaction performance is the typical focus of a performance monitoring strategy, monitoring infrastructure performance can add insight to underlying factors in business transaction performance. AppDynamics can alert you to the problem at the business transaction level and the infrastructure level.

AppDynamics provides preconfigured application infrastructure metrics and default health rules to enable you to discover and correct infrastructure problems. You can also configure additional persistent metrics to implement a monitoring strategy specific to your business needs and application architecture.

In addition to health rules, you can view infrastructure metrics in the Metric Browser. In this context, the Correlation Analysis and Scalability Analysis graphs can be particularly useful for understanding how infrastructure metrics can correlate or relate to business transaction performance.

Integrating and Extending AppDynamics

AppDynamics provides many ways for you to extend AppDynamics Pro and integrate metrics with other systems. The AppDynamics Exchange contains numerous extensions you can download, and you can develop your own if you can’t find what you need.

Extensions for AppDynamics come in the following categories:

- Monitoring Extensions add metrics to the existing set of metrics that AppDynamics agents collect and report to the Controller. These can include metrics that you obtain from other monitoring systems. They can also include metrics that your system extracts from services that are not instrumented by AppDynamics, such as databases, LDAP servers, web servers, or C programs. To write specific monitoring extensions, see Extensions and Custom Metrics.
- Alerting Extensions let you integrate AppDynamics with external alerting or ticketing systems and create custom notification actions. To learn how to write specialized custom notification see Build a Custom Action. Also, see Email Templates and HTTP Request Actions and Templates.
- Performance testing extensions consist of performance-testing extensions, such as the one described on Integrate AppDynamics with Apica.
- Built-in integration extensions are bundled into the AppDynamics platform and only need to be enabled or configured. These include:
  - Integrate AppDynamics with Splunk
  - Integrate AppDynamics with DB CAM

For creating custom extensions and integration components for AppDynamics, see the AppDynamics API information.