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Enhancing Application Reliability: Leveraging Synthetic Monitoring for Continuous Availability and Performance Optimization

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ABSTRACT

Synthetic monitoring has become a key strategy for maintaining the continuous availability and optimal performance of applications in today's complex and distributed IT landscape. Synthetic monitoring uses automated scripts to mimic user interactions, providing a means to proactively identify and address potential issues before real users are affected. Unlike real user monitoring (RUM), which relies on actual user sessions, synthetic monitoring works independently of real user interactions, providing continuous insights into application health from various global and private locations. This paper examines the integration of Dynatrace Synthetic Monitoring within a full-stack observability framework, demonstrating the merits of this approach in enhancing application reliability, reducing downtime, and boosting operational efficiency. Leveraging Dynatrace's AI-driven analytics, customizable synthetic tests, and comprehensive monitoring capabilities has proven to significantly reduce the mean time to detect (MTTD) and mean time to resolve (MTTR) issues. This contributes to a more stable and predictable environment. Additionally, the paper discusses future research and enhancement opportunities, such as expanding synthetic monitoring to cover emerging technologies, advancing AI and machine learning capabilities, and developing adaptive, self-healing systems to further boost application performance and user experience.

Keywords: Synthetic Monitoring, Proactive Monitoring, Full-Stack Observability, Application Performance Management (APM), Real User Monitoring (RUM), AI-Driven Analytics, Anomaly Detection, Root Cause Analysis, Service Level Agreements (SLAs), Infrastructure Monitoring, Global Monitoring Network, User Experience, Cloud Monitoring, Digital Experience Monitoring, Serverless Computing, Edge Computing, Self-Healing Systems.

INTRODUCTION

In today's increasingly complex and distributed IT landscape, maintaining continual availability and performance of critical applications is crucial. Synthetic monitoring is a proactive approach to ensure application availability and performance by simulating user interactions. Unlike real user monitoring which collects data from real user activity on the application, synthetic monitoring uses automated scripts to mimic real user actions, such as accessing web pages, navigating to different pages, performing critical functionalities in applications, etc. [3][5]. These simulations are run at regular intervals from different locations allowing organizations to identify potential issues before real users are impacted [5][7][9]. Synthetic monitoring is very effective for detecting bottlenecks, ensuring SLA compliance, and maintaining optimal user experience especially during times of low traffic or before launching new updates [4][5][6]. Fig 1 shows synthetic monitoring and some of its uses.

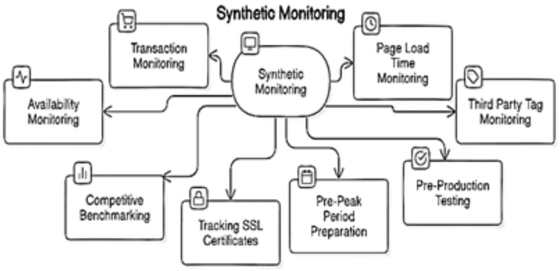


Fig. 1. *Synthetic monitoring and some of its uses*

A. Ideal Tool for Synthetic Monitoring

The selection of an appropriate synthetic monitoring tool is crucial. An ideal tool should encompass the following features:

• **Full-Stack Observability:** An optimal tool should also encompass real user monitoring, infrastructure monitoring, application monitoring, telemetry, log monitoring, event monitoring, and AI-driven analytics all in the same platform. This allows the comparison between real-user driven data and synthetic monitor driven data [1]. The availability of full stack monitoring allows a deep-dive into performance or availability degradations to understand the root-cause [2].

• **AI-Powered Insights**: Combing through all the metrics and traces to identify the root-cause can be extremely strenuous. A good tool should leverage AI engine to automatically detect anomalies and provide root cause analysis [6][11].

• **Global Monitoring Network**: One of the key uses of synthetic monitoring is to understand the behavior of an application when accessed from different parts of the world [2]. It is important for the synthetic monitoring tool to provide a wide variety of global locations to run the test. It is also important for these locations to use a good mix of various cloud platform providers such as AWS, Azure, and GCP [7][10].

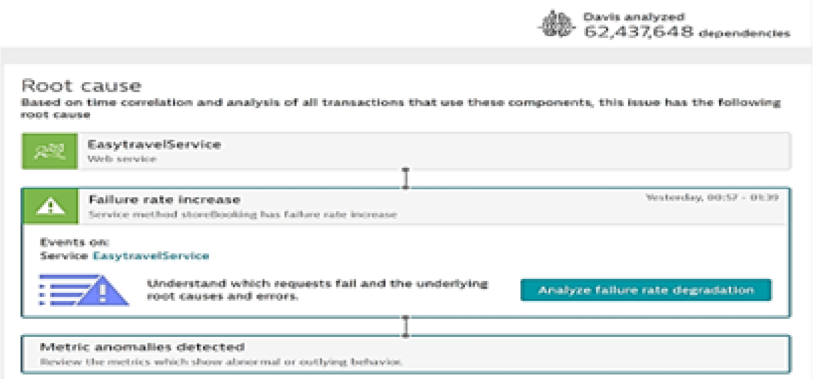
• **Private Monitoring Locations**: As important as it is to understand the behavior of an application from global locations, it is vital to understand how an application behaves when accessed from different locations in the data center. Therefore, a good synthetic monitoring solution should provide an easy means to deploy private locations in the data center allowing to test from inside the firewalls [7].

• **Customization and Scalability:** The monitoring needs vary from application to application. The optimal tool should provide monitoring options to customize the tests to their specific needs whether it is single-URL, complex user journey, APIs, etc.

B. Selection of Synthetic Monitoring Tool

This paper focuses on the integration of Dynatrace Synthetic Monitoring within a full-stack observability framework. Dynatrace was chosen for its robust capabilities, which include:

• **Full-Stack Monitoring and AI-Powered Insights**: Dynatrace provide an all-in-one platform beyond APM (Application Performance Management). Dynatrace has the ability to monitor the entire technical stack of an application and leverage "DAVIS", the causation engine to continuously analyze billions of dependencies and automatically surface problems, including their root-cause and business impact [11]. The Fig. 2 below shows Dynatrace's AI Engine DAVIS auto detecting problems and identifying potential root-cause [11]. Dynatrace has a built-in topology visualization tool that provides a holistic view of the environment showing dependencies in the infrastructure, processes, and services [8] as shown in Fig. 3.



Davis analyzed
62,437,648 dependencies

Root cause
Based on time correlation and analysis of all transactions that use these components, this issue has the following root cause

EasytravelService
Web service

Failure rate increase
Service method storeBooking has failure rate increase
Yesterday, 00:57 - 01:39

Events on:
Service EasytravelService

Understand which requests fail and the underlying root causes and errors.

Metric anomalies detected
Review the metrics which show abnormal or outlying behavior.

Fig. 2. *Dynatrace's AI Engine DAVIS auto detecting problems and identifying potential root-cause [11]*

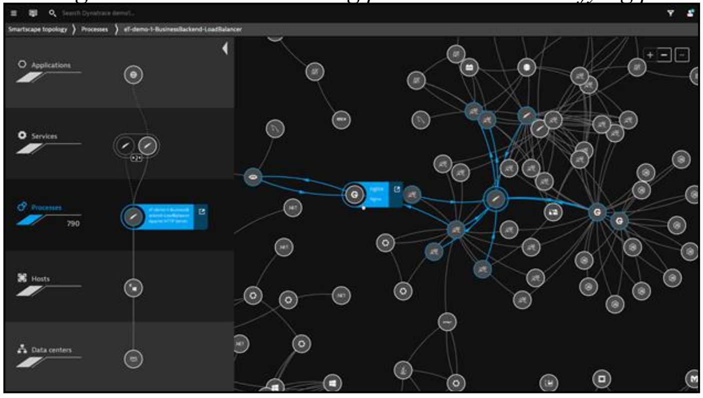


Fig. 3. *the Horizontal and vertical dependency mapping auto-detected by Dynatrace [11]*

• **Global Reach and Flexibility:** Dynatrace provide a wide range of global locations across various cloud providers including AWS, Azure, Alibaba, GCP [10].

• **Other Customizable Synthetic Tests**: Dynatrace also provides a wide variety of customizable synthetic tests [7]. Some of them are highlighted in this paper:

- Browser monitors - These monitors simulate the loading of a single page view with a real browser.
- Browser Clickpaths - Clickpaths simulate workflows within the application. Dynatrace offers a recorder (a Chrome browser extension) that records the steps and converts them into a scrip that the synthetic monitoring uses to test [3].
- HTTP monitors – These monitors can be used when a full-blown browser isn't required (for example, monitoring the availability of an API endpoint). HTTP monitors use HTTP(S) requests to monitor the given URL [5].
- DNS Lookup – This synthetic test checks the time it takes for a domain name to be resolved to the corresponding IP address [9].
- Port Checks – Port check verifies whether a port on a server is open and is accepting connections [9].
- Ping – A ping test measures the round-trip time it takes for a packet to travel from the test location to the server and back [9].

• **Ease of use and integration:** Dynatrace make deployment of tests simple and the interface user-friendly [7]. Dynatrace integrates multiple monitoring capabilities into a single platform which makes it easier for the Development, DevOps, and Performance Engineering teams to gain insights across their entire technology stack without needing multiple tools [8] as shown in Fig. 4.

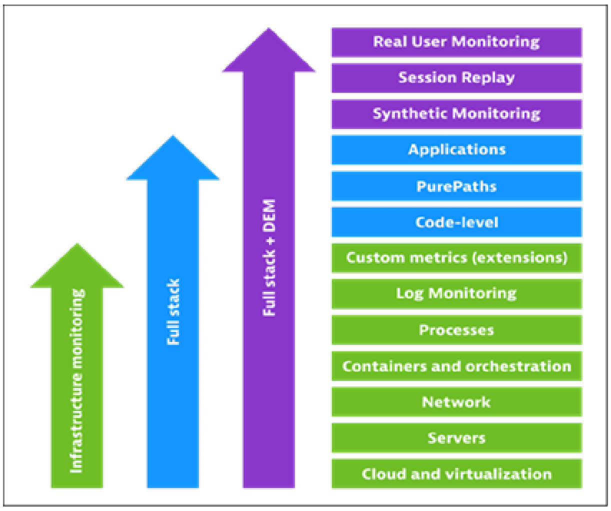


Fig. 4. *Multiple monitoring capabilities in a single Dynatrace platform [8]*

LITERATURE REVIEW

Synthetic monitoring has become an essential tool to proactively monitor the modern IT infrastructure. Traditional monitoring like real user monitoring (RUM) depends on real user interactions with the application to identify problems [2]. During times of low traffic and before release of a new feature where there are no real users the issues are not identified as there is no data coming in to the monitoring tool [4]. This leaves a gap in monitoring where an application could be down for a prolonged duration before user interact with the application and face the problem. Synthetic monitor can fill the gap by simulating the real user actions and continuously testing the application.

A. Evolution of monitoring practices

There is a significant trend in the IT industry moving away from reactive monitoring in favor of proactive monitoring. Traditional monitoring tools often focus on responding to issues after they have occurred which could lead to extended downtimes and a reactive firefighting approach to IT management. With mechanisms such as synthetic monitoring, organizations can get ahead of the issue and identify them before the users start getting impacted [1]. This shift is also facilitated by the advancements of full-stack monitoring, which integrates infrastructure monitoring, application monitoring, and real user monitoring. Full-stack observability allows organizations to gain deeper insights to their technology stack and understand the complexities [8].

B. The role of AI and Machine Learning in Synthetic Monitoring

The incorporation of AI and machine learning into synthetic monitoring has significantly enhanced the effectiveness of synthetic monitoring. AI and ML are capable to understanding the data and proactively detecting patterns and identifying anomalies [8]. These capabilities help in reducing the MTTR (mean time to resolve), MTTD (mean time to detect). This allows organizations to maintain a higher level of service availability, reliability and user satisfaction [3][4].

C. Challenges and future direction

Despite the advancements of synthetic monitoring there is a growing need for support and flexibility for the emerging technologies such as serverless monitoring, IoT, edge computing etc. These technologies introduce a new set of variables that traditional synthetic monitoring tools may not address [7].

METHODOLOGY

The proposed framework aims to integrate a comprehensive synthetic monitoring into the existing IT infrastructure to proactively test and monitor the performance of critical services. Unlike real user monitoring (RUM), which collects data from actual user interactions, synthetic monitoring mimics the same user actions and tests them from different locations at regular intervals. These tests are performed continuously, regardless of user traffic, ensuring that issues are detected and resolved before they impact real users.

A. Architecture

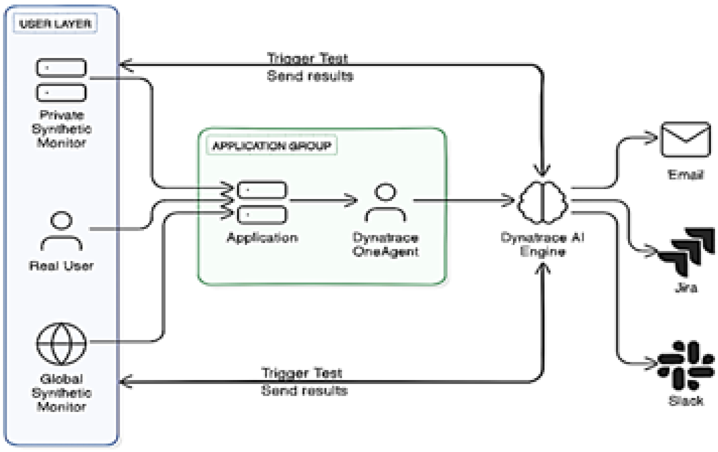


***Fig. 5**. Proposed synthetic monitoring framework*

Fig. 5 illustrates a comprehensive synthetic monitoring framework utilizing Dynatrace, designed to deliver continuous availability and performance monitoring, even during periods of low traffic and before new feature deployments.

In this architecture, the user layer has three components: real users and bots located in both private and global locations. The Real User Monitoring (RUM) captures data from real user interactions. The monitoring data travels to the application server along with the HTTP requests and responses. The data is then collected by Dynatrace's OneAgent, which is deployed on the application server and transmitted to the Dynatrace cluster for further analysis. For bots operating in private and global locations, Dynatrace sends the necessary information to execute the tests at predefined intervals. The resulting data is sent back to Dynatrace. Since the application is also equipped with Dynatrace's OneAgent, Dynatrace can correlate the synthetic monitoring sessions with backend application giving full-stack observability. Once the data reaches Dynatrace, its AI engine (DAVIS) analyzes the data and triggers alerts for anomalies based on predefined conditions. For the purpose of this paper, these alerts are communicated via JIRA, Slack, and Email.

B. Implementation

Identification of Critical Application Workflows: Identify and map critical application workflows, which are crucial for business operations. These workflows typically exercise the entire technical stack of the application, include high traffic and transaction heavy integrations, such as authentication, search functionality, checkout process. The mapping is essential for determining where synthetic monitoring should be applied and what specific metrics need to be collected.

• Determining the type of synthetic monitor needed:

Based on the workflows the type of test, frequency of test, type of locations and number of locations would need to be determined.

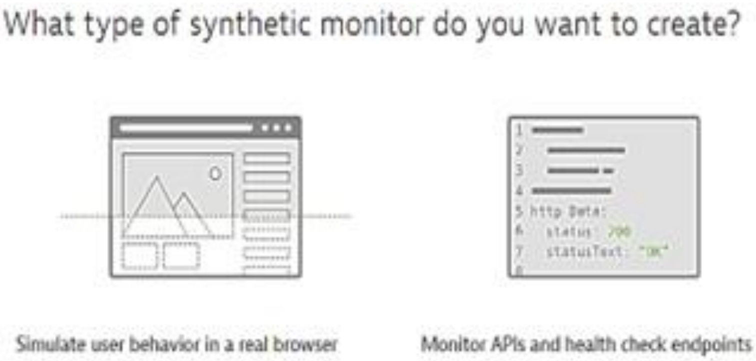

What type of synthetic monitor do you want to create?
http Data:
status: 200
statusText: "OK"
Simulate user behavior in a real browser
Monitor APIs and health check endpoints

Fig. 6. *Selecting the type of Synthetic monitor needed*

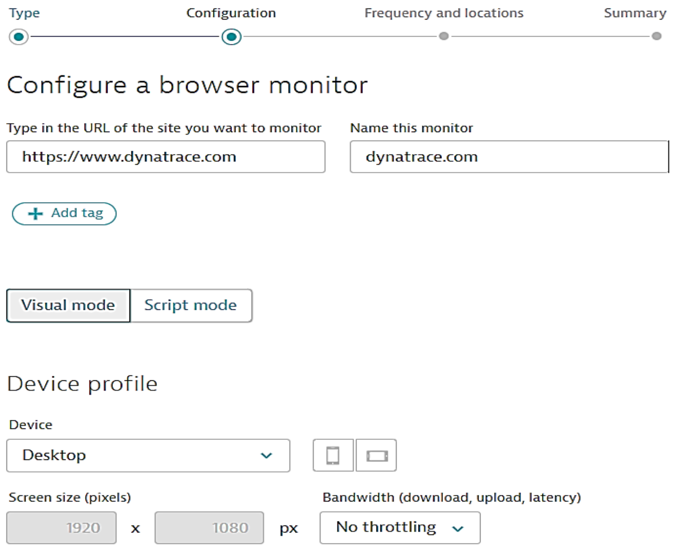
Single-URL browser monitors are used for monitoring load time and availability of crucial endpoints. Clickpath monitors would be used for complex multi-step transaction that involve user inputs and interactions. HTTP monitors would be used for backend service monitoring mostly RESTful API calls.

The choice of monitoring locations should be based on the accessibility of the workflow. If the workflow is accessible outside the organization's network, multiple global locations should be utilized. If it is only accessible within the organization's network, multiple private locations are recommended. For workflows accessible both internally and externally, a combination of global and private locations is advised. Additionally, when using global locations, it is recommended to incorporate a diverse mix of cloud providers, such as AWS, Azure, and GCP, to ensure comprehensive coverage.

If a workflow runs multiple times a day, it is advisable to set the synthetic monitor's frequency to a shorter interval than the workflow's regular frequency. For instance, if the workflow runs every 30 minutes, the synthetic monitor should be configured to run every 15 minutes. This approach allows the monitor to detect potential issues before they impact the workflow.

• Creation of Synthetic Monitors:

To create a single URL monitor, start by clicking on the "Create a Browser Monitor" button. This action opens a page where the URL to be monitored can be entered, assign a name to the monitor, and select the device profile, which includes choosing the type of device to emulate and the bandwidth settings for the test. Additional options on this page include configuring global authentication, adding custom HTTP headers, and setting cookies. Once the necessary details are provided, proceeding to the next page provides the option to select the monitoring frequency and location. After making these selections, a summary of the monitor will be displayed on the following page like shown in Fig. 8, and the synthetic test can be finalized by clicking the "Create Browser Monitor" button.



Configure a browser monitor

Type in the URL of the site you want to monitor: https://www.dynatrace.com

Name this monitor: dynatrace.com

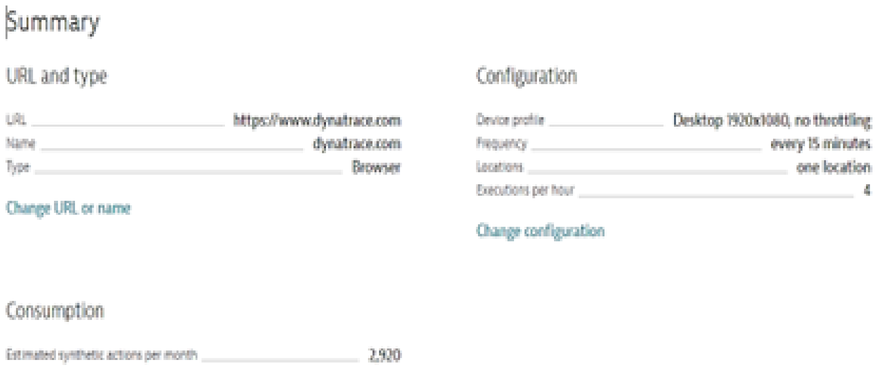
Device profile

Device: Desktop

Screen size (pixels): 1920 x 1080 px

Bandwidth (download, upload, latency): No throttling

Fig. 7. *Creation of single-URL synthetic monitor. This monitor loads the web page https://www.dynatrace.com with a device profile of desktop (screen size 1920x1080 px) and has no throttling.*



Summary

URL and type

URL https://www.dynatrace.com
Name dynatrace.com
Type Browser

Change URL or name

Configuration

Device profile Desktop 1920x1080, no throttling
Frequency every 15 minutes
Locations one location
Executions per hour 4

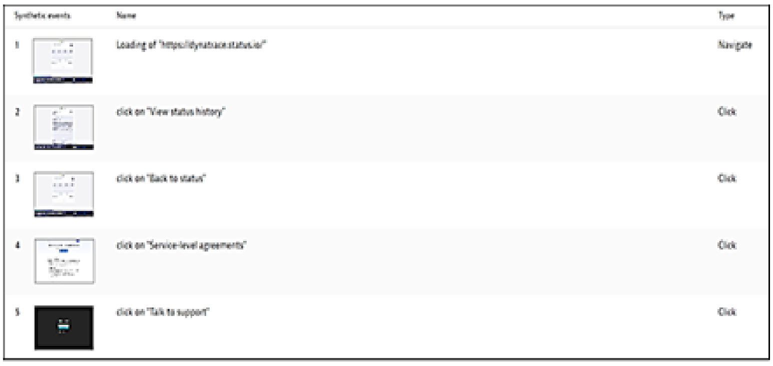
Change configuration

Consumption

Estimated synthetic actions per month 2,920

Fig. 8. *Summary of the created synthetic monitor*

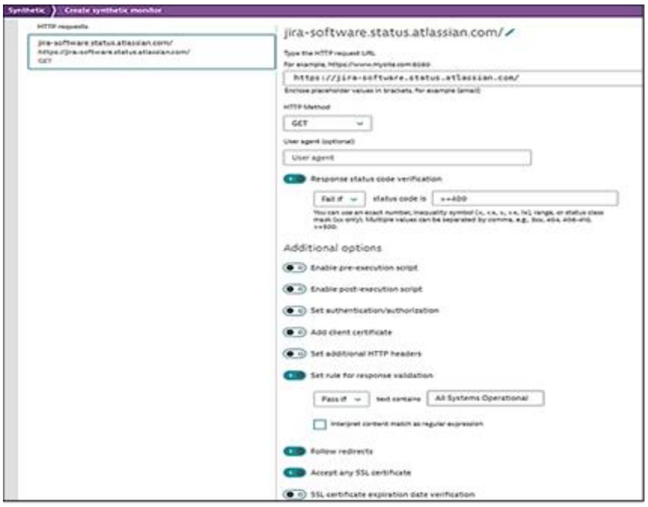
To create a Clickpath browser monitor, begin by selecting the "Create a Browser Monitor" option and enter the URL to be monitored. After specifying the device profile and any additional options, click on "Record Clickpath." This opens the specified URL in an incognito browser where the desired actions within the workflow can be performed. Once the workflow is completed, close the browser. The recorded Clickpath events will be displayed at the bottom of the page, where the events can be renamed, wait times adjusted, and set conditions such as waiting for a page to load, waiting for a specific element to appear, or pausing for a set period. It is recommended to add content validation to the synthetic monitor by clicking "Add Content Validation Rule." This allows the test to pass or fail based on the presence of specific text on the loaded webpage. Additionally, HTTP authentication can be added to any particular page, with credentials securely stored in the Credential Vault for later retrieval by the synthetic monitor. Once the Clickpath is recorded, click "Next" to select the frequency and locations for the test. Review the summary of the test on the subsequent page, and complete the setup by clicking "Create Browser Monitor."



Synthetic events	Name	Type
1	Loading of "https://dynatrace.status.io/"	Navigate
2	click on "View status history"	Click
3	click on "Back to status"	Click
4	click on "Service-level agreements"	Click
5	click on "Talk to support"	Click

Fig. 9. *ClickPath test, loading a status page and navigating to multiple different web pages starting from the status page*

To create an HTTP monitor, select the "Create an HTTP Monitor" option and provide a name for the test. Click "Add HTTP Request" and enter the URL for the request as shown in Fig. 10, along with a name and the HTTP method, which can be selected from options such as GET, POST, PUT, DELETE, HEAD, PATCH, and OPTIONS. After adding the HTTP request, the response status code verification configured to either pass or fail based on the returned status code. Additional options include enabling pre-execution or post-execution scripts (to run specific JavaScript snippets before or after the HTTP request), setting authentication or authorization, adding a client certificate, including custom HTTP headers, and defining rules for response validation. Proceed to the next page to select the frequency and locations for running the test. On the summary page, an overview of the test, including its name, frequency, locations, number of HTTP requests, and the number of licenses consumed per month will be provided. Finally, clicking "Create HTTP Monitor" completes the creation of the HTTP monitor.



Synthetic 〉 Create synthetic monitor

HTTP requests

jira-software.status.atlassian.com/
https://jira-software.status.atlassian.com/
GET

jira-software.status.atlassian.com/

Type the HTTP request URL
For example, https://www.mysite.com:8080

https://jira-software.status.atlassian.com/

Enclose placeholder values in brackets, for example {email}

HTTP Method: GET

User agent (optional): User agent

Response status code verification

Fail if · status code is · >=400

You can use an exact number, inequality symbol (<, <=, >, >=, !=), range, or status class mask (xx only). Multiple values can be separated by comma, e.g., 3xx, 404, 408-410, >=500.

Additional options

- Enable pre-execution script
- Enable post-execution script
- Set authentication/authorization
- Add client certificate
- Set additional HTTP headers
- Set rule for response validation

Pass if · text contains · All Systems Operational

□ Interpret content match as regular expression

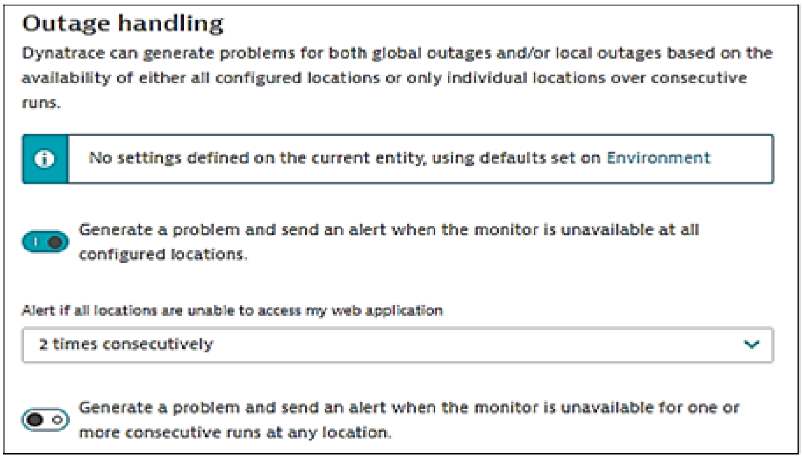
- Follow redirects
- Accept any SSL certificate
- SSL certificate expiration date verification

Fig. 10. *Creation of HTTP Monitor*

• Configuring the alerts:

Dynatrace provides outage handling mechanism and performance threshold definitions that can be used to trigger alerts when identified.

For effective outage handling, it is advisable to configure alerts to trigger only when the monitor is inaccessible from all locations as shown in Fig. 11. This approach provides a fail-safe mechanism to avoid false alerts. If one of the multiple nodes selected encounters an issue, the other nodes can still access the application, preventing an unnecessary alert from being triggered. This strategy ensures that alerts are only generated when the issue is with the workflow itself, not with the nodes running the test. Additionally, it is recommended to set multiple attempts for failure detection. This helps prevent alerts due to minor network glitches that may temporarily cause accessibility issues. By doing so, Dynatrace will make multiple attempts from all locations, and if the failure persists across all locations over several attempts, it can be concluded that the alert is valid and actionable, rather than a false positive.



Outage handling

Dynatrace can generate problems for both global outages and/or local outages based on the availability of either all configured locations or only individual locations over consecutive runs.

No settings defined on the current entity, using defaults set on Environment

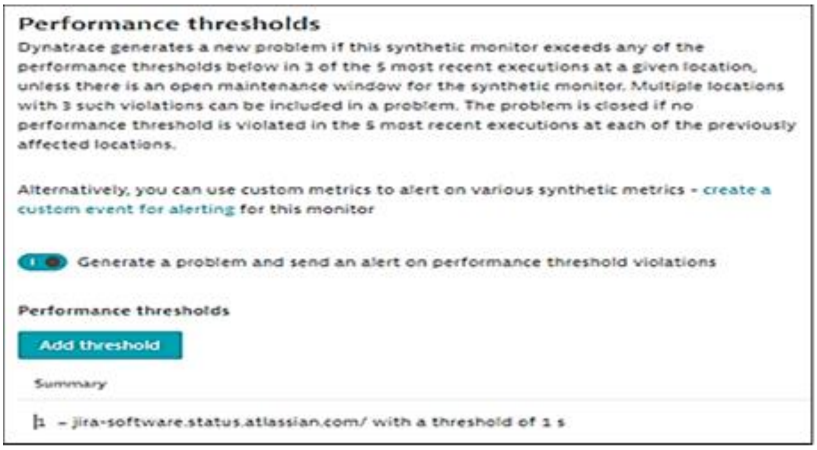
Generate a problem and send an alert when the monitor is unavailable at all configured locations.

Alert if all locations are unable to access my web application: 2 times consecutively

Generate a problem and send an alert when the monitor is unavailable for one or more consecutive runs at any location.

Fig. 11. *Outage handling configuration for Synthetic monitors*

Performance threshold can be defined for the synthetic tests and if the listed threshold is breached for 3 of 5 most recent executions for a given location an alert is raised unless there is an existing maintenance window.



Performance thresholds

Dynatrace generates a new problem if this synthetic monitor exceeds any of the performance thresholds below in 3 of the 5 most recent executions at a given location, unless there is an open maintenance window for the synthetic monitor. Multiple locations with 3 such violations can be included in a problem. The problem is closed if no performance threshold is violated in the 5 most recent executions at each of the previously affected locations.

Alternatively, you can use custom metrics to alert on various synthetic metrics - create a custom event for alerting for this monitor

● Generate a problem and send an alert on performance threshold violations

Performance thresholds

Summary

1 – jira-software.status.atlassian.com/ with a threshold of 1 s

Fig. 12. *Performance Threshold configuration for Synthetic monitors*

• Routing the alerts:

Dynatrace provides a means to group multiple entities that belong to the same applicational or functional grouping. This grouping in Dynatrace is called management zones. The created synthetic monitors must be added to an appropriate management zone. An alerting profile can be created for a management zone. This groups the alerts generated by all the entities in the management zone and provides a trigger to send the alerts out. A single alerting profile can be linked to multiple integrations like Email, ServiceNow, JIRA, Slack, Pager Duty, etc.

CONCLUSION

The integration of Dynatrace Synthetic Monitoring within a full-stack observability framework offers a robust solution for maintaining the performance and availability of critical applications. By simulating user interactions across multiple global/ private locations and correlating these results with real user monitoring, application performance management, and infrastructure monitoring, organizations can proactively identify and resolve issues before they impact end users. This comprehensive approach ensures that applications consistently meet service level agreements (SLAs) and deliver a reliable and high-quality user experience.

The implementation of this framework has yielded significant improvements in application reliability and user satisfaction. Organizations have reported notable reductions in Mean Time to Detect (MTTD) and Mean Time to Resolve (MTTR) performance issues. Previously, when an issue occurred during low traffic periods or outside business hours, it could take approximately 4 to 8 hours before a real user encounters the problem, leading to its identification. However, with the implementation of synthetic monitoring, the detection time has been reduced to a maximum of 30 minutes, representing a 12.5% reduction in MTTD. This early detection also contributes to a quicker resolution process. With the integration of synthetic data into Dynatrace's full-stack monitoring, which includes potential root cause identification, the MTTR has decreased from an estimated 6 to 8 hours (during off-business hours) to about 2 to 3 hours—a 37.5% reduction. This results in a more stable and predictable application environment. Furthermore, the framework's ability to deliver detailed root cause analysis has enabled IT teams to resolve issues more effectively, leading to increased operational efficiency.

FUTURE WORK

Future work on the integration and enhancement of Dynatrace Synthetic Monitoring within a full-stack observability framework could explore several key areas to further improve performance, reliability, and user experience. These areas include expanding coverage into new emerging technologies, enhancing AI engine to include more models and machine learning capabilities and developing adaptive and self-healing mechanism.

Expansion into Emerging Technologies: The technology landscape increasingly adopt serverless computing, edge computing, and IoT, the synthetic monitoring framework should be expanded to address these new technologies and the workflows that come along with them. This will require developing new synthetic test types suited to the specific characteristics of these technologies and integrating their monitoring data into the existing framework.

Enhanced AI and Machine Learning Integration: Although Dynatrace's Davis AI already offers powerful anomaly detection and root cause analysis. Future research could explore the advancement of the machine learning models used and different types of AI engines in addition to the existing causation-based AI Engine (DAVIS). These enhancements could improve the precision of predictions, uncover more complex patterns, and provide even deeper insights into performance issues.

Adaptive and Self-Healing Monitoring Systems: Building on current capabilities, future enhancements of the framework could incorporate integration into CI/CD pipeline and self-healing mechanisms, where the system not only detects and alerts on issues but also automatically implements corrective actions.

By concentrating on these areas, the Dynatrace Synthetic Monitoring framework can continue to evolve and deliver even greater value to organizations as they manage increasingly complex and distributed IT environments.

REFERENCES

[1]. C. Phipathananunth and P. Bunyakiati, "Synthetic Runtime Monitoring of Microservices Software Architecture," 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), Tokyo, Japan, 2018, pp. 448-453, doi: 10.1109/COMPSAC.2018.10274. keywords: {Monitoring;Unified modeling language;Runtime;Tools;Testing;Software;Servers;microservices;monitoring;software test automation},

[2]. CITO, J., GOTOWKA, D., LEITNER, P., PELETTE, R., SULJOTI, D., & DUSTDAR, S. (2015). IDENTIFYING WEB PERFORMANCE DEGRADATIONS THROUGH SYNTHETIC AND REAL-USER MONITORING. Journal of Web Engineering, 14(5-6), 414–442. Retrieved from https://journals.riverpublishers.com/index.php/JWE/article/view/3845

[3]. “What is Synthetic Monitoring,” smartbear.com. https://smartbear.com/learn/performance-monitoring/what-is-synthetic-monitoring/

[4]. “Benefits of synthetic monitoring,” smartbear.com. https://smartbear.com/learn/topic-area/benefits-of-synthetic-monitoring/

[5]. E. Cohen, “Synthetic Monitoring Tool | Synthetic Transaction Monitor - Site24x7.” [Online]. Available: https://www.site24x7.com/synthetic-monitoring.html

[6]. A. Grabner, “4 steps to modernize your IT service operations with Dynatrace,” Dynatrace News, Jun. 30, 2020. [Online]. Available: https://www.dynatrace.com/news/blog/4-steps-to-modernize-your-it-service-operations-with-dynatrace/

[7]. J. Livens, “What is synthetic monitoring? How emulating user paths improves outcomes,” Dynatrace News, Dec. 14, 2021. [Online]. Available: https://www.dynatrace.com/news/blog/what-is-synthetic-monitoring/

[8]. Unknown, “How effective is infrastructure monitoring on its own?,” Dynatrace Docs, Jan. 04, 2019. https://docs.dynatrace.com/docs/platform-modules/infrastructure-monitoring/hosts/monitoring-modes/how-effective-is-infrastructure-monitoring-on-its-own

[9]. M. Lundstrom, “Easily monitor your entire infrastructure with Dynatrace Synthetic monitors,” Dynatrace News, Jul. 21, 2020. [Online]. Available: https://www.dynatrace.com/news/blog/monitor-your-whole-infrastructure-using-synthetic-monitors/

[10]. Unknown, “Public Synthetic locations,” Dynatrace Docs, Oct. 07, 2020. https://docs.dynatrace.com/docs/platform-modules/digital-experience/synthetic-monitoring/general-information/public-synthetic-locations

[11]. K. Aigner, “It’s time to upgrade AppMon to Dynatrace now!,” Dynatrace News, Dec. 21, 2019. [Online]. Available: https://www.dynatrace.com/news/blog/its-time-to-upgrade-appmon-to-dynatrace-now/