

# Unbreakable Continuous Delivery

Dynatrace in your Cloud Native DevOps Toolchain





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DevOps Activist  
Dynatrace

Blog:  
<https://www.dynatrace.com/news/blog/author/andreas-grabner/>

Youtube:  
<https://www.youtube.com/playlist?list=PLqt2rd0eew1YFx9m8dBFSiGYS8cDuWG38>

1

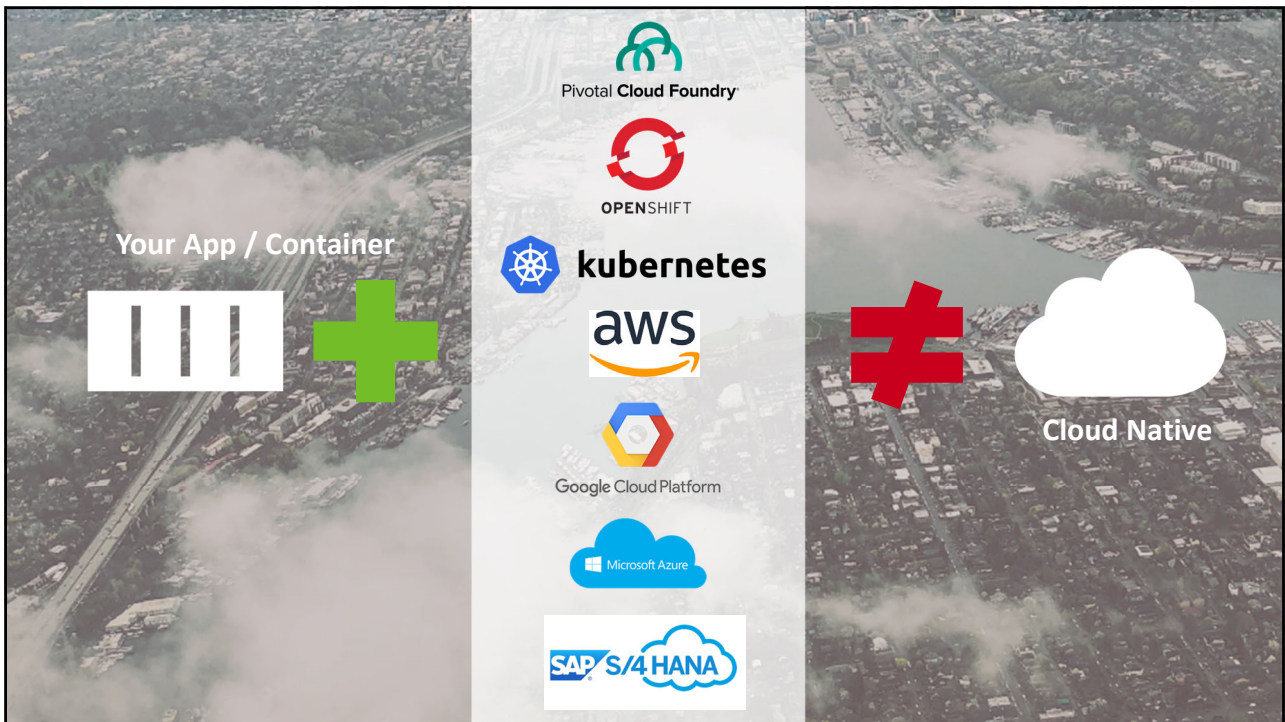


**dynatrace Perform**

Your App / Container + [Pivotal Cloud Foundry, OpenShift, Kubernetes, Google Cloud Platform, Microsoft Azure, AWS, SAP S/4 HANA] ≠ CloudNative

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**dynatrace**  
**Perform**

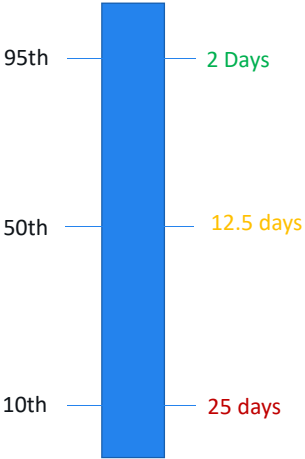
To proof my point: Autonomous Cloud Survey - <https://dynatrace.ai/acsurvey>

~80 Responses



- # of Sprints vs # of Releases
- Dev to Ops Ratio
- Commit Cycle Time
- Feature Lead Time
- % of Bad Releases
- Mean Time to Repair (MTTR)
- Autonomous Operation Score
- Used Platforms & Tooling
- ...

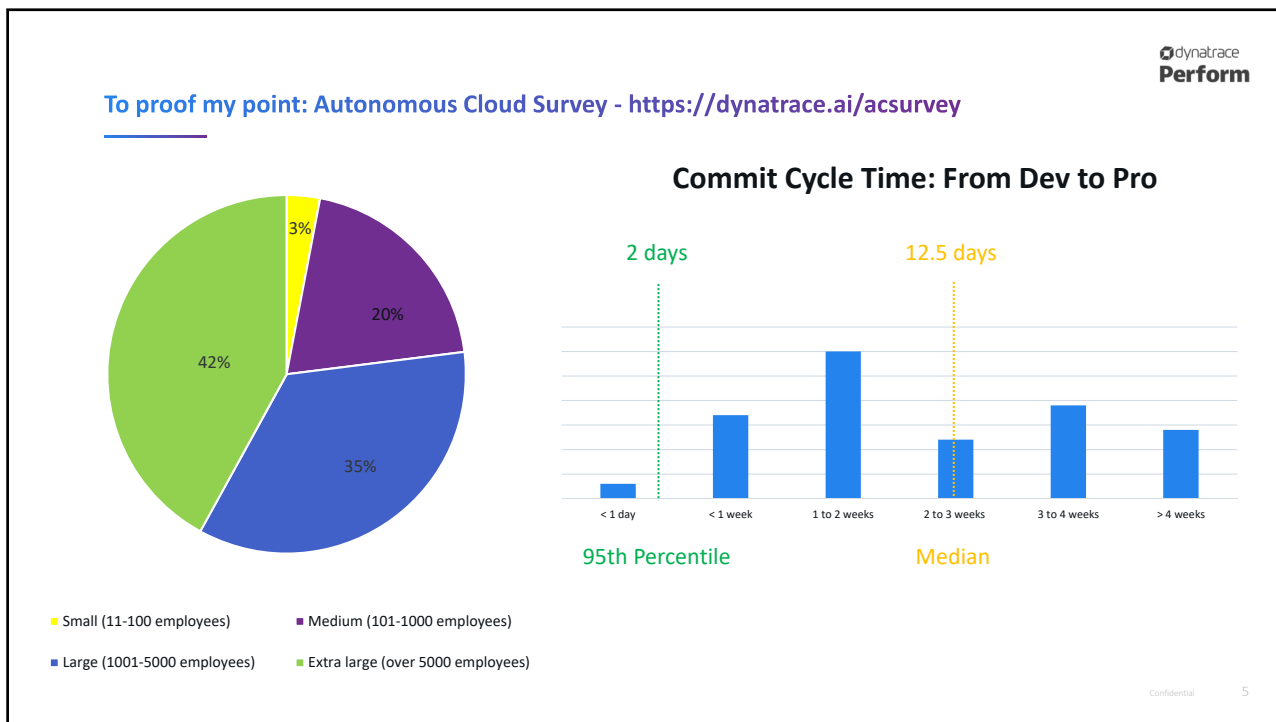
**Commit Cycle Time**



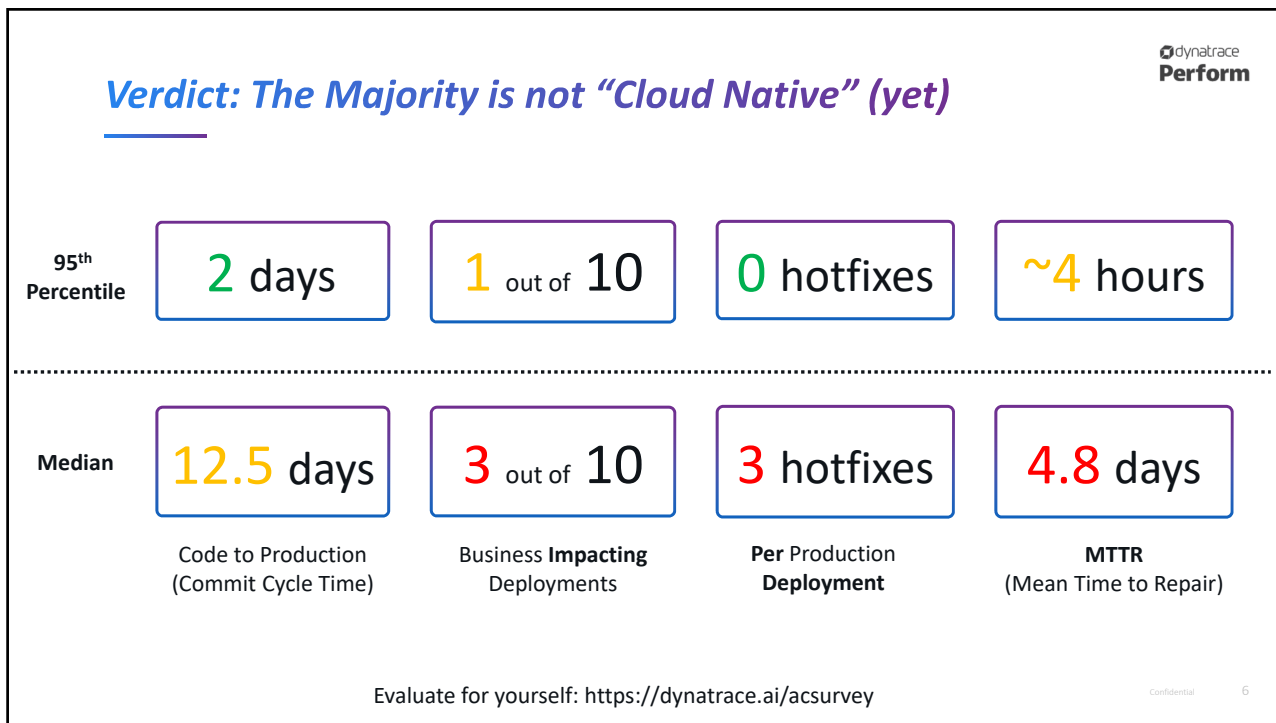
Percentile	Commit Cycle Time
95th	2 Days
50th	12.5 days
10th	25 days

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### Addressing the Key Differentiators with "Unbreakable Delivery Pipeline" Blueprint!



**Automated Monitoring** as a Pipeline Feature



**Automate Quality** (Shift-Left): Stopping bad code changes early and automated in the pipeline



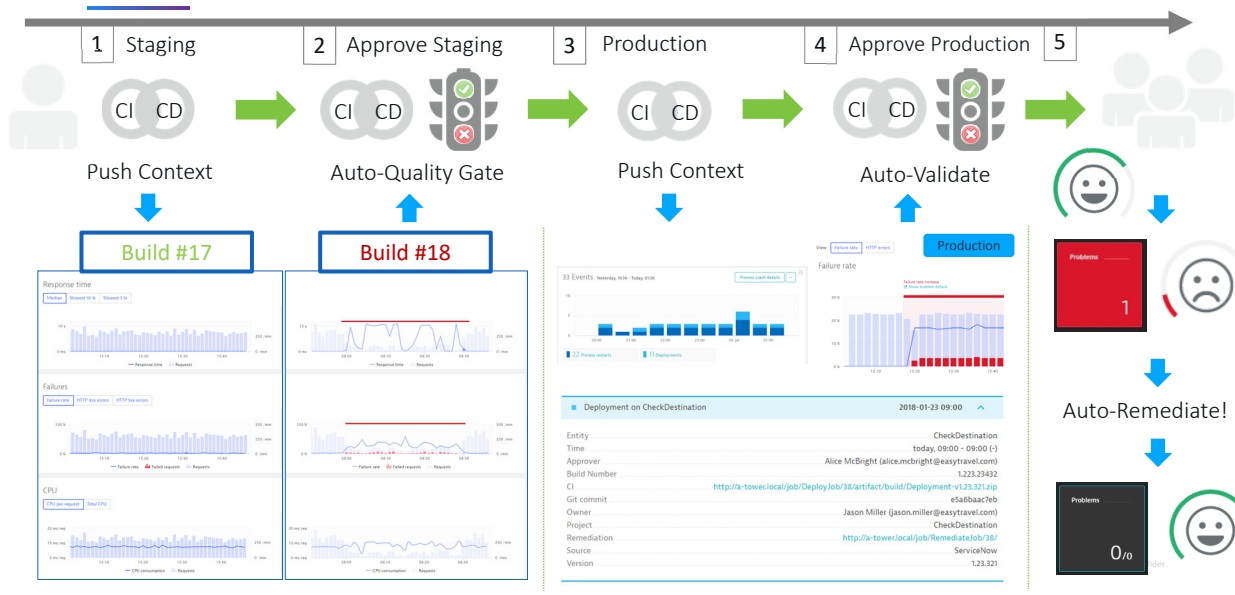
**Automate Deployment** (Shift-Right): Push "Monitoring as Code" for Auto Validation & Auto-Alerting



**Automate Operations** (Self-Healing): Auto-Mitigate bad deployments in production

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### Unbreakable Delivery Pipeline Blueprint in Action



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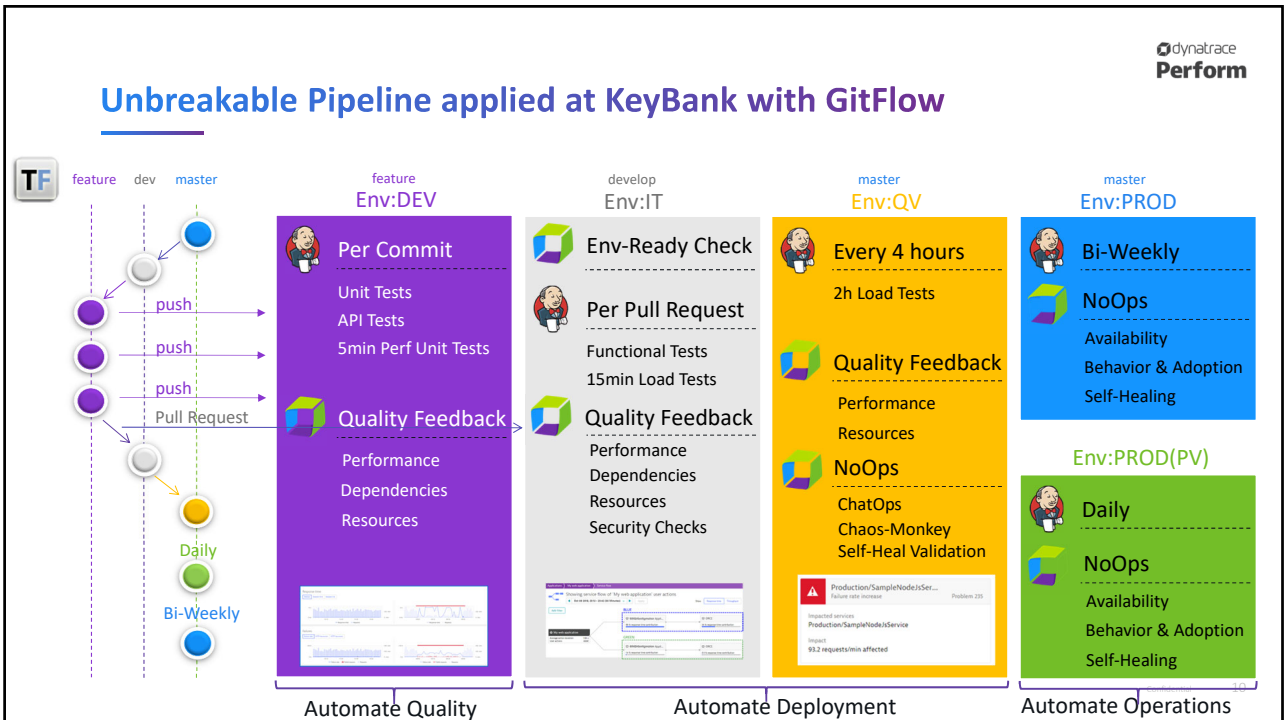


**dynatrace**  
**Perform**

**@KeyBank: Blueprinting Workshop**

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**dynatrace**  
**Perform**

**Unbreakable Pipeline applied at KeyBank with GitFlow**

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The slide is titled "Benefits of Unbreakable Continuous Delivery" and features the Dynatrace Perform logo in the top right corner. It is divided into three columns, each representing a benefit. The first column, "Better", shows a downward arrow and "75% production incidents", with "Early Regression Detection" above and "Automate Quality" below. The second column, "Faster", shows a downward arrow and "97% deployment lead time", with "Automating Quality Gates" above and "Automate Deployment" below. The third column, "More Frequently", shows an upward arrow and "12 to 26 releases per year", with "Blue/Green & Self-Healing" above and "Automate Operations" below. A horizontal dashed line separates the top and bottom sections. The bottom right corner contains the text "Confidential 11".

**Benefits of Unbreakable Continuous Delivery**

*Better*  
↓ 75%  
production incidents  
Early Regression Detection  
Automate Quality

*Faster*  
↓ 97%  
deployment lead time  
Automating Quality Gates  
Automate Deployment

*More Frequently*  
↑ 12 to 26  
releases per year  
Blue/Green & Self-Healing  
Automate Operations

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The slide has a blue-to-purple gradient background. The main title "Automate Monitoring" is centered in white, bold font. Below it, the subtitle "Monitoring as a Pipeline Feature" is also centered in white. The bottom right corner contains the text "Confidential 12".

**Automate Monitoring**

Monitoring as a Pipeline Feature

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**Best Practices Rolling out Dynatrace OneAgent**

**Automate Rollout**

- OPERATOR FRAMEWORK
- CLOUDFOUNDRY BOSH
- puppet labs
- CHEF
- Y
- Git

**Automate Monitoring**

Full Stack - Powered by Dynatrace One Agent

- Applications
- Services
- Processes
- Hosts (18)
- Staging
- Data centers

**Automate Tags & Meta Data**

- [Environment]application: sockshop
- environment: staging service: shipping
- [Kubernetes]deployment: everest-8 [Kubernetes]deploymentconfig: everest
- [AWS]Namespace: agrabner [AWS]Stage: workshop
- [AWS]kubernetes.io/cluster/agrabner-workshop-keptn01-cluster: owned

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**Best Practice: Management Zones for Apps & Stages**

Internet Banking

**Edit management zone**

Management zone name: Internet Banking

Add new rule

Filter by rule name

- Active Rule
- Services tagged with 'CI:INTERNET BANKING'
- Web applications where Web application name equals 'Mobile Online Banking Web'
- Mobile applications where Mobile application name equals 'Mobile Online Banking'
- Web applications where Web application name equals 'ibxqv1.key.com'
- Web applications where Web application name equals 'ibxqv2.key.com'

**Application Overview**

- Services Overview: All file 130
- Services Resp Time: Response time (average) chart
- DB Time: No data
- Database health: Problems 0
- Host Mem: Memory usage chart
- Host CPU: CPU usage chart
- Tomcat Busy Threads: Tomcat busy threads chart
- Tomcat Life Threads: Tomcat life threads chart
- JVM Threads: JVM threads chart
- GC Activations: GC activations chart
- GC Time: GC time chart
- Process Memory Used: Process memory used chart

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### Best Practice: Management Zones for Apps & Stages

#### Edit management zone

Management zone name  
Key Navigator

Add new rule

Filter by rule name

Active Rule

- Services tagged with 'CI:KEY NAVIGATOR' and tagged with 'TLA:CXP'
- Web applications where Web application name contains 'keynav'
- Web applications where Web application name contains 'cxp'

#### Application Overview

Search prod... Key Navigator

Services Overview: All Fine 15

Database health: All Fine 1

Problems: 0

Services Resp Time

DB Time

Host Mem

Host CPU

Tomcat Busy Threads

Tomcat Idle Threads

JVM Threads

GC Activations

GC Time

Process Memory Used

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# Automated Quality Gates (Shift-Left)

Stopping bad code changes early and automated in the pipeline

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### Shift-Left: Monitoring Specification as Code

monspec

```

{
  "lowerBound": 1,
  "upperBound": 100,
  "_comment": "global configuration environment-wide",
  "timeseries": [
    {
      "timeseriesId": "com.dynatrace.builtin.service.responsetime",
      "aggregation": "avg",
      "entityIds": "SERVICE-3211ABE8813B9239",
      "lowerBound": 1000000,
      "upperBound": 2000000
    }
  ]
}
                
```

Test case: CruPerformanceTestingInt

Timestamp: Dec 13, 2018 5:11:26 PM

**Incidents**

Severe Incident: SpecFile threshold violation: Services - Response time upper bound exceeded

**Services - Response time**

Services - Response time - overall (Average)

Services - Response time - CRU - CruftsSpvrWS (Average)

Measure	Value	Min
overall (Average) (MilliSecond)	143	0
CRU - CruftsSpvrWS (Average) (MilliSecond)	143	0

Automatic Feedback

Performance-driven Automatic Quality Gates

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### Shift-Left: Performance Diagnostics as a Self-Service

**Top database statements**

Analyze the most frequent and most expensive database statements in monitored server-side applications.

**Top web requests**

Understand and analyze which web requests are the most expensive and most frequently called.

**Exception analysis**

Understand and analyze all code-level exceptions in monitored server-side applications.

**Distribution**

- No interaction with services or queues
- Database usage
- Service execution

**Response time**  
+843 ms (199 s)

**Top findings**

- Active wait time: +1.02 s
- Network IO time: +67.5 ms

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# Automated Deployment (Shift-Right)

Push "Monitoring as Code" for Auto Validation & Auto-Alerting

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## Smart auto-remediation workflow



The screenshot displays the Dynatrace Perform interface. At the top, there's a 'Smart auto-remediation workflow' diagram with four steps: 1 Code / Config Change, 2 Production Issue, 3 Incident Response, and 4 Incident Resolved. Below this, the main interface shows a 'CheckDestination' service with a 'Deployment on CheckDestination' event highlighted. A modal window is open over this event, displaying the following details:

Deployment on CheckDestination		2018-01-23 09:00
Entity	CheckDestination	
Time	today, 09:00 - 09:00 (-)	
Approver	Alice McBright (alice.mcbright@easytravel.com)	
Build Number	1.223.23432	
CI	<a href="http://a-tower.local/job/DeployJob/38/artifact/build/Deployment-v1.23.321.zip">http://a-tower.local/job/DeployJob/38/artifact/build/Deployment-v1.23.321.zip</a>	
Git commit	e5a6baac7eb	
Owner	Jason Miller (jason.miller@easytravel.com)	
Project	CheckDestination	
Remediation	<a href="http://a-tower.local/job/RemediateJob/38/">http://a-tower.local/job/RemediateJob/38/</a>	
Source	ServiceNow	
Version	1.23.321	

The background interface shows a '4 Problems in last 72 hours' section with a 'Problem 197: Response time degradation' highlighted. There are also charts for 'Requests', 'Response time', and 'CPU' visible.

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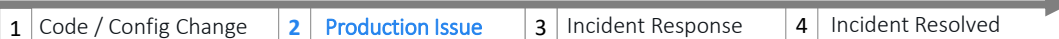
# Automated Operations (Self-Healing)

Auto-Mitigate bad deployments in production

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## Smart auto-remediation workflow



**www.easytravel2b.com: User action duration degradation**  
 Problem 197 detected at 07:57 (open for 12 minutes).  
 This problem affects real users.

	Affected	Recovered	Monitored
Applications	1	-	15
Services	13	-	105
Infrastructure components	1	-	845

87,837,750 Dependencies analyzed

---

**Business impact analysis**  
 An analysis of all affected service calls and impacted real users during the first 10 minutes of the problem shows the following potential impact.

152 Impacted users      11.4k Affected service calls  
[Show more](#)

---

**1 impacted application**  
 128 User actions per minute impacted

**www.easytravel2b.com**  
 Application

**User action duration degradation**  
 The current response time (251 s) exceeds the auto-detected baseline (168 s) by 1,395 %

Affected user actions	User action
128/min	All

---

**Root cause**  
 Based on our dependency analysis all incidents have the same root cause.

**CheckDestination**  
 Service Instance

1 Deployment  
 CheckDestination v1.23.321

Entity	CheckDestination
Time	today, 09:00 - 09:00 (1)
Approver	Alice McBright (alice.mcbright@easytravel.com)
Build Number	1.23.23432
CI	<a href="http://a-tower.local/job/DeployJob/38/artifact/build/Deployment-v1.23.321.zip">http://a-tower.local/job/DeployJob/38/artifact/build/Deployment-v1.23.321.zip</a>
Git commit	e5a6baac7eb
Owner	Jason Miller (jason.miller@easytravel.com)
Project	CheckDestination
Remediation	<a href="http://a-tower.local/job/RemediateJob/38/">http://a-tower.local/job/RemediateJob/38/</a>
Source	ServiceNow
Version	1.23.321

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## Smart auto-remediation workflow

Incident Notification

**Thread**

**Davis Dev** #Backend-one Today at 10:30 PM

An increase in failure rate on Frontend was detected by Dynatrace. (updated Today 10:33 PM)

**61% Increase in Failure Rate**

<b>Start Time</b> Today at 10:21 PM	<b>Affected Services</b> Backend_one Frontend
<b>Ticket</b> DAV-1684	<b>Assigned To</b> Mike
<b>Failure Rate</b> 100%	<b>Affected Requests per Minute</b> 61

**Root Cause**

- Backend\_one
  - Increase in Failure Rate

Remediation  Add Comment

Backend\_one - Backend one production... hg configuration.

5 replies

**Davis Dev** #Backend-one 2 minutes ago

**Michael Beemer Said:**  
The ticket DAV-1684 was created in JIRA by Mike and assigned to Dan.  
Via JIRA.

Trigger Specific Remediation Action

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## Smart auto-remediation workflow

**www.easytravelb2b.com: User action duration degradation**  
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	Affected	Recovered	Monitored
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An analysis of all affected service calls and impacted real users during the first 10 minutes of the problem shows the following potential impact.

152 impacted users    11.4k affected service calls

1 impacted application  
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**www.easytravelb2b.com**  
Application

**User action duration degradation**  
The current response time (251 s) exceeds the auto-detected baseline (168 s) by 1,395 %

Affected user actions	User action
128/min	All

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**CheckDestination**  
Service Instance

1 Deployment  
CheckDestination v123.321

Entity	CheckDestination
Time	today, 09:00 - 09:00 (1)
Approver	Alice McBright (alice.mcbright@easytravel.com)
Build Number	122323432
CI	http://a-tower.local/job/DeployJob/38/artifact/build/Deployment-v123.321.zip
Git commit	e5a6baac7eb
Owner	Jason Miller (jason.miller@easytravel.com)
Project	CheckDestination
Remediation	http://a-tower.local/job/RemediateJob/38/
Source	ServiceNow
Version	1.23.321


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[keptn.sh](https://keptn.sh): **OpenSource Framework for Unbreakable Pipeline & more**




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 **keptn**

**Enterprise-grade framework for shipping and running cloud-native applications**







Deployable on any Kubernetes cluster, keptn converts any Kubernetes cluster into a self-healing, autonomous cloud fabric.

**Core capabilities**

-  Automated multistage unbreakable delivery pipelines
-  Self-healing blue/green deployments
-  Event-driven runbook automation

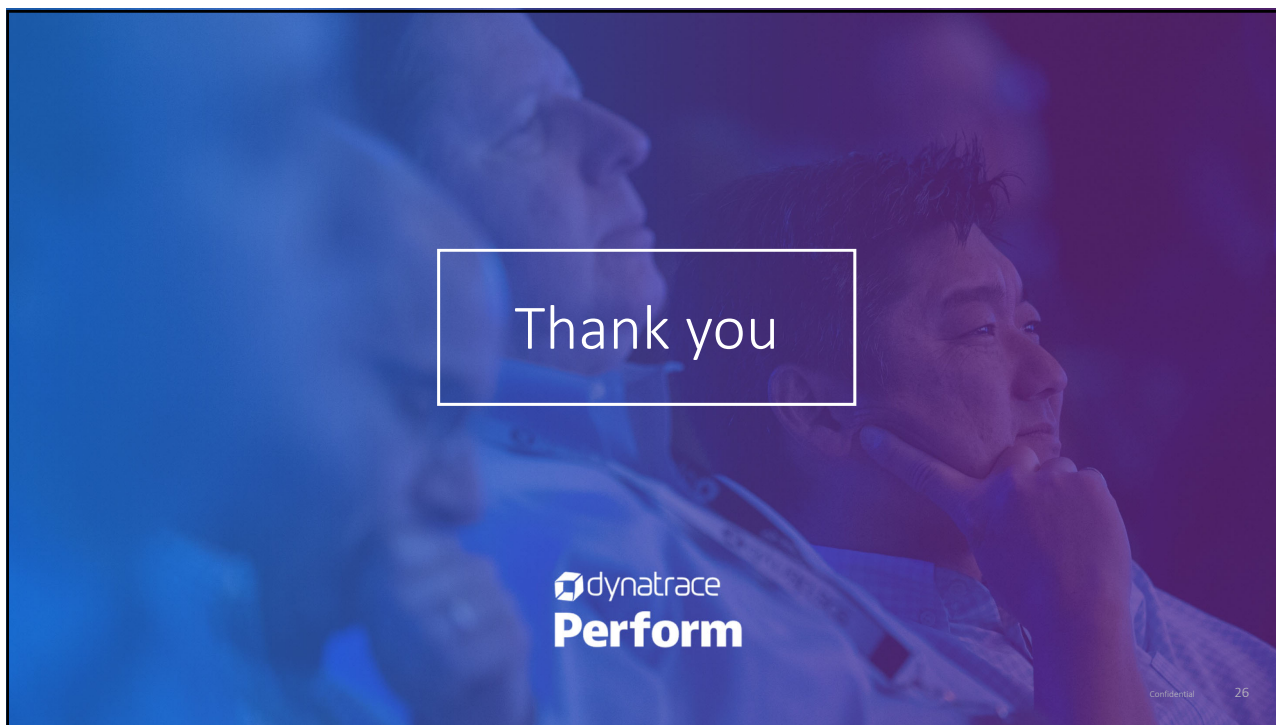
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**Design Principles**

-  GitOps-based collaboration
-  Operator patterns for all logic components
-  Monitoring and operations as code
-  Built on and for Kubernetes
-  Event-driven and serverless
-  Pluggable tooling

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