

# Enterprise Observability and Cloud-Native Applications

*An Executive Overview from*

**INSTANA**

an IBM Company

## A New Application Stack Needs Different Performance Monitoring

New application platforms typically lead to application monitoring failure, due to visibility gaps, creating the impetus for new monitoring technology to appear. The dynamic ephemeral world of orchestrated containerized microservices has led to massive gaps, extending beyond the capabilities of legacy APM tools.

### A Trifecta of Challenges

Nothing could prepare the industry for the triple challenge currently facing Dev and Ops teams, converging to create a multitude of visibility and management challenges:

- **Technical Complexity**  
*Cloud-native* infrastructure (Kubernetes-orchestrated containerized microservices) has led to an exponential explosion of application components and dependencies.
- **Increased Development Velocity**  
The question is no longer “how many updates do you release in a year?” The timeline in question is now more like a week, or a day, or even a single hour.
- **Organizational Evolution**  
Organizations are putting more responsibility on developers to ensure that production code runs as expected. A tool only used by 10 – 20 Ops members doesn’t help.

Each of these challenges leads to visibility gaps, but with all three in play, traditional APM tools just can’t keep up. That’s why Instana’s founders, all with extensive APM experience, set out to change the world with Enterprise Observability.

## Enterprise Observability

Instana provides the automated real-time infrastructure, service and applications monitoring you need to handle cloud-native applications and keep up with Ci/CD development. While built to handle cloud-native apps, Instana can also manage monolithic and SOA applications.

### Automatic Broad Visibility

Instana automatically monitors over 300 app technologies, with code-level visibility for 14 different languages, all with zero human configuration required to identify, install, setup or configure Instana monitoring (including dashboard setup and alert threshold setting).

### Full Real-Time Context

Instana sees and maps all dependencies between services, application and infrastructure (updating in real time), helping DevOps (and Instana’s AI) understand all their applications.

### Actionable Intelligence

The sheer amount of data from these complex applications is capable of quickly overwhelming Dev and Ops teams. The automatically delivered contextual understanding allows stakeholders to take intelligent actions. It also allows the tool, itself, to take intelligent actions.

## APM / Observability Democratization through Ease of Use

Instana's observability platform was built from the ground up with the intent of being easy to use. Starting with complete automation, removing the need for human involvement (even as application changes occur), the entire system is designed for easy-to-understand broad stakeholder use across Ops, Dev, QA, SRE, and even business executives. Instana offers automatically configured, dynamic dashboards based on the technologies being monitored. There are multiple perspectives to the available data.

### Infrastructure

The dynamic infrastructure map shows bare metal, virtual and cloud servers (including containers), automatically organized by type and/or zone. For orchestrated environments, the infrastructure map can be switched to a container-centric view.

Color coding and smart pop-ups allow users to see the exact status of each and every component of their infrastructure.

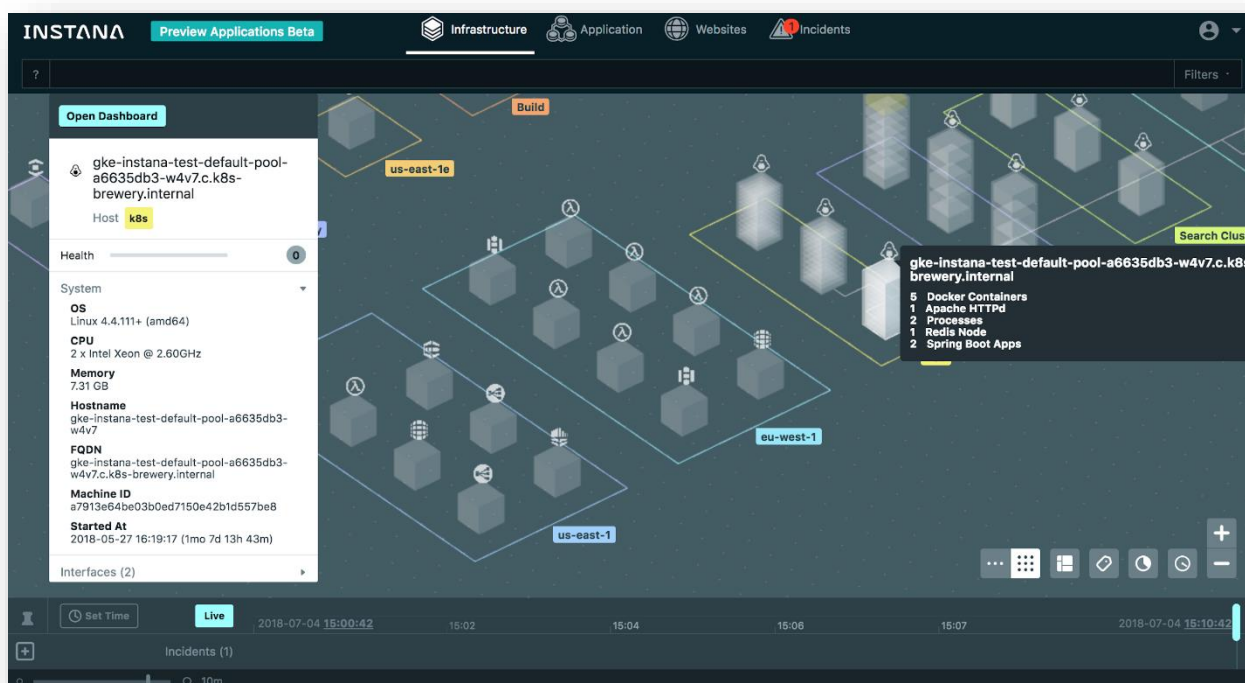


Figure 1: Instana's real-time infrastructure map, which can be organized by servers/hosts or by containers. Pop-ups and rollovers help identify key components and any health issues.

## Applications and Services

There are several distinct service and/or application maps within the Enterprise Observability Platform. Remember, Instana automatically discovers all services **and their interdependencies to each other and the infrastructure**. Knowing all the dependencies allows Instana to create several distinct view for users

### Service List

A list of all services and endpoints discovered within the application environment, each with its own automatically generated custom dashboard, which includes health check status, based on the complete service technology stack.

### Service and/or Application Map

A visualization of services, accompanied by dependency connections (and optionally, with data flow animation). Web page and/or mobile App requests can be used to create an alternate view where the service map is laid out linearly from user requests dully into the backend.

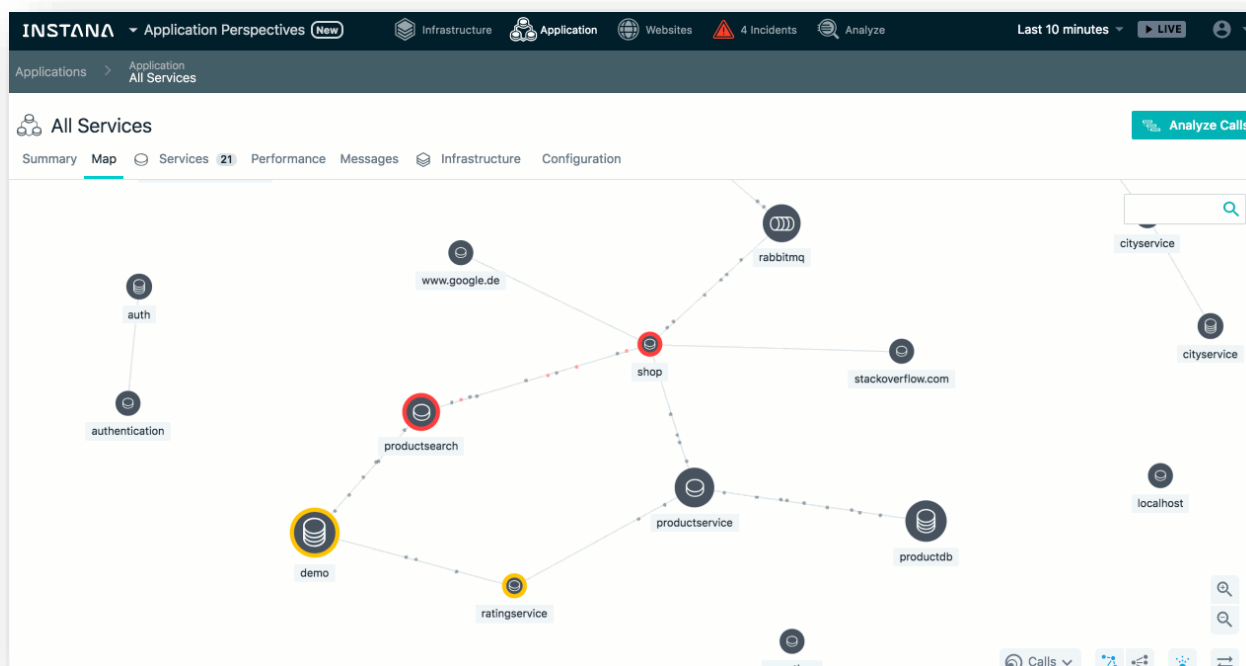


Figure 2: Instana Service Dependency Map: showcasing all inter-dependencies between services, with optional dataflow animation

## How Instana Works

### ***Installation, Discovery, Configuration, Mapping and Updating***

Remember automation? After installing the agent onto hosts (servers, VMs), your Instana agent(s) automatically detect all service components and the full application / infrastructure stack. The visualizations are created from this streaming data in real time.

Individual component health is determined based on a curated knowledgebase for all supported technologies (300+). Application health is also **automatically** determined, based on behavioral anomalies and the appearance of any known issues or patterns (as derived from the built-in AI).

Instana collects all events, warnings and issues with individual infrastructure and software services, automatically alerting users to situations that are predicted to impact service levels (called Incidents in the platform). All events and issues are correlated to incidents, enabling Instana to determine the cause of incidents and bring the event and/or issue to the attention of the assigned team / user for quick correction.

### **Metrics, Logs, Traces – AND Profiles**

Instana has a vast collection of metrics from microservices, technology stacks, mobile apps, browsers, and more. But in the world of high velocity dynamic applications, this isn't enough to help application stakeholders understand everything they need to.

### **Zero-Sample Streaming | No Sampling | 1 second granularity | 3 Seconds to alerts**

Instana captures and streams all metrics with 1 second granularity, never sampling so that users never miss a performance issue or potential outage. When changes occur, Instana updates all maps in 3 seconds, also instantly notifying users of the status of the update.

### **100% Distributed Tracing**

Instana automatically captures (and stores) an end-to-end distributed trace of every request.

### **Continuous Production Profiling**

Instana automatically profiles every Java, Node.JS and PHP process – ALL THE TIME!

### **Support for OpenTracing, Zipkin, OpenTelemetry, Jaeger, Prometheus, etc.**

Wanting to provide the best of both worlds, Instana includes support for open-source monitoring and tracing protocols, correlating any data received from these APIs with the automated data from Instana's agents / sensors.

## Application Perspectives - Personalized Application Monitoring

To help everyone get the most out of observability, Instana created personalized views and filters for individual users, teams and organizations. Application Perspectives are an easy way to identify a set of services / components of interest to an individual or team.

- Automatically generated custom views show ONLY data (maps, metrics, traces) for calls that pass through / use the components of interest
- For problems, this delivers a personally guided troubleshooting experience
- Helps users of different types (business executives, application owners, developers, etc.) see data across the application that makes sense for their tasks
- Shareable URLs facilitate collaboration within teams and across the organization

Here are Application Perspectives examples that showcase how monitoring is made easier to use and understand for all application stakeholders:

- Differentiating between dev, test, and production environments
- Easy analysis of blue-green deployments, A/B, and canary testing
- Aligning monitoring visualizations to individual or team roles

## Integrated, Correlated Serverless Monitoring

Instana can monitor serverless functions / workloads without any special setup across several different technologies – AWS Lambda, AWS Fargate, Google Cloud Run.

Instana's agent monitors performance and traces distributed user requests through these serverless workloads just the same as traditional code.

Thus, Instana is the only observability / monitoring solution that provides the same level of visibility, tracing and troubleshooting capabilities for serverless functions as it does for standard functions and services.

## Unique Valuable Product Capabilities

Instana's Enterprise Observability Platform was built to be different from other application and infrastructure monitoring solutions. While the list of unique differentiated features would span volumes, here are a collection of key capabilities that are unique to Instana:

### Observability / Monitoring tool with Fully Automated Monitoring Setup, Deployment, Configuration, Mapping, Alerting and Updating

- Automatic and continuous discovery of what needs to be monitored
- Automatic stack identification and monitoring with technology-specific sensors
- Single agent monitors everything
  - One-liner installation of the Agent
  - Automatically attaches to and monitors supported technologies with zero config
  - No reboots required to START or STOP monitoring in most cases
  - Agent automatically updates itself
  - Agent lives OUTSIDE of the monitored application runtime, preventing impact of the monitored application's heap

### Automatic Comprehensive Collection of High Granularity Data

- Collects a distributed trace for EVERY application request with low overhead
- Collects metrics in 1 second granularity, the industry's shortest monitoring period
- Even with this high granularity, Instana has the industry's lowest overhead
- Live data streaming provides near real-time insight (updates & alerts in 3 seconds)
- Automatically captures profiles of every Java, NodeJS and PHP process

### Everything is Automatically Correlated and Analyzed

- Instana correlates infrastructure, services, applications, traces, profiles, API data, and anything else ingested by the platform
- Automatic service endpoint identification and monitoring
- Detailed automatic orchestration monitoring (more than just metrics) for all Kubernetes variants, Docker Swarm, and DC/OS
- Personalized "application" definitions created via UI

### AI-Assisted Troubleshooting

- Automatic root cause analysis identifies triggering event
- Depending on the incident and triggering event, automated remediation is possible
- Unbounded Analytics allows advanced analysis of all data correlated together

For more success stories about Instana's Enterprise Observability Platform, check out <https://instana.com/customers> - sign up for a free trial at <https://instana.com/trial>