

A P P E N S U R E

AppEnsure's End User Centric APM Product Overview

January 2016

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Overview

AppEnsure provides application performance management (APM) for IT Operations to proactively provide the best end user experience.

AppEnsure measures the end user experience (EUE) in terms of response time and throughput to manage application performance. Uniquely, AppEnsure correlates EUE with the application delivery infrastructure performance providing IT Operations with the needed Application Operational Intelligence to manage service levels that maximize enterprise productivity and revenue generation. By measuring end-to-end response time of real (not synthetic) transactions through the entire stack, AppEnsure provides contextual, actionable intelligence to reduce resolution of application brownouts and blackouts by 95%.

AppEnsure allows IT Operations to manage every application that they have in production, irrespective of the source of that application (legacy, custom developed or purchased), its operating system platform (Windows or Linux), and its execution environment (physical hardware, data center virtualization, private cloud, hybrid cloud, or public cloud).

At AppEnsure, we believe the focus of application performance should always align with business goals and be obsessively focused on end user experience – the critical dimension for enterprise APM.

Key Benefits Summary

- Detect application issues before they affect your end users
- Evaluate user, effectiveness, efficiency and productivity
- Recognize real user demand for applications
- Monitor and validate service-level agreement compliance
- Discover what is normal and determine if normal is optimal
- Identify the components and applications that are causing performance issues
- Expedite diagnosis and remediation of performance problems

Key Capabilities Summary

End User Experience measured on real transactions – Synthetic transactions will never reflect the reality of the world. AppEnsure focuses on real transactions to prevent performance problems before they cause disruption of business processes. AppEnsure give IT Operations improved visibility into their IT infrastructure and the ability to identify potential problems before end users start calling the help desk.

Monitor the impact on end user experience across infrastructure tiers – AppEnsure provides the ability to evaluate the impact of each of the infrastructure tiers or service that application is dependent upon on the quality of the end user experience by correlating response time measurements taken at different points in the application service delivery chain.

Unprecedented end-to-end visibility for Citrix environments - Citrix XenApp/XenDesktop provide unified delivery platform enabling enterprises to couple cloud computing with application and desktop virtualization to realize the combined resource optimization, infrastructure agility and economic benefits from a single platform. AppEnsure correlates end user experience with the application delivery infrastructure performance providing IT Operations with unique Application



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Operational Intelligence to prevent Citrix delivery slowness affecting user productivity. AppEnsure empowers IT Operations to proactively anticipate, troubleshoot, resolve, and prevent performance issues in the most complex Citrix XenApp and XenDesktop environments.

Ability to prevent application performance issues before business users are impacted – AppEnsure enables you to be proactive regarding managing the quality of the end user experience for enterprise applications because the quality of the end user experience could lead to revenue loss as it impacts employee productivity.

Instant value to IT Operations - AppEnsure automatically discovers, with absolutely zero manual configuration, all of the applications in the customer's environment, names them, maps their topology across all of the tiers of the application system, and then in real time and on a continuous basis, measures their end-to-end response time and throughput. These automatic processes provide instant visibility (and oftentimes unknown) applications and end user experience.

Breadth of applicability – The ability to provide optimal performance for *every* application. AppEnsure helps manage every Windows and Linux application, including both custom developed and purchased applications (90% of the applications that customers run are purchased). It also includes the ability to follow an application as it migrates from physical hardware to a data center virtualization platform like VMware or Hyper-V, to a private cloud managed by a product like VMware vCloud Automation Center or OpenStack, to hybrid clouds hosted by vendors like Terramark or Savvis, and to public clouds like Amazon EC2, Windows Azure and various OpenStack based clouds.

Automated root cause analysis – using a sophisticated combination of self-learning analytics and dependency rules, AppEnsure automatically tells the administrator what element in the infrastructure supporting the application is causing the degradation in the performance of the application or the downtime of the application. AppEnsure then proposes actionable resolutions that IT Ops can implement to return the application to the desired performance or required SLA.

How AppEnsure Works

The AppEnsure product consists of two components: Master and Agents.

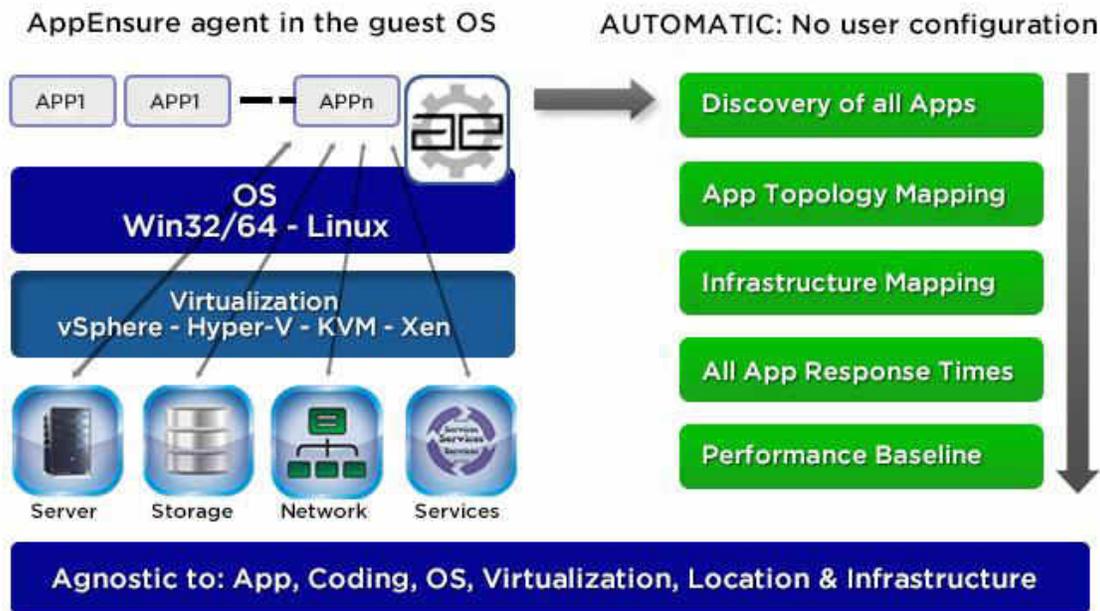
The AppEnsure Master is provided as a virtual appliance which stores and presents data from the Agents. A web browser is used to access the AppEnsure console through the Master.

AppEnsure Agents

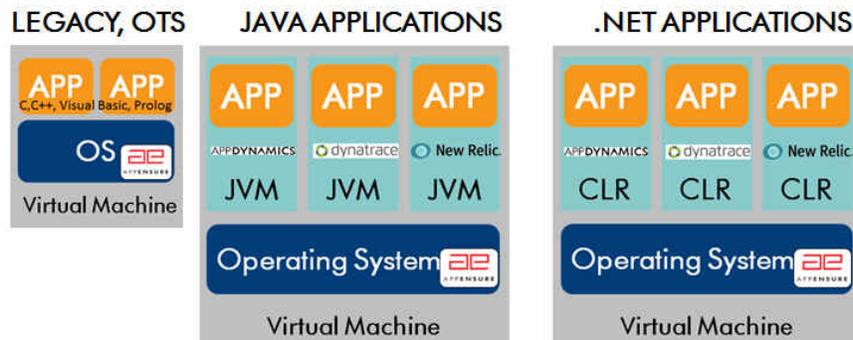
AppEnsure delivers a light agent into the guest OS which monitors all transactions between an application and each infrastructure element. It is agnostic to application, coding, OS, virtualization and infrastructure. From monitoring multiple transactions in each contextual dataflow, we baseline historical normal response times, both hop-by-hop and end-to-end. When a specific transaction exceeds this norm, initially preset, but user configurable, we compare the current measured latency of each hop to deterministically locate which element has slowed, reducing application performance.



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- Agent runs in OS as service
- Does NOT require an agent per JVM/CLR
- Does NOT require an agent per interpreter
- Provides in-depth view of
- Intra JVM/CLR/Processes details
- Does NOT provide code analysis
- Works with any application written in any language plus off the shelf standard packaged applications
- Works with OTS applications where byte code instrumentation is NOT possible
- Provides applications interactions with infrastructure & service dependencies

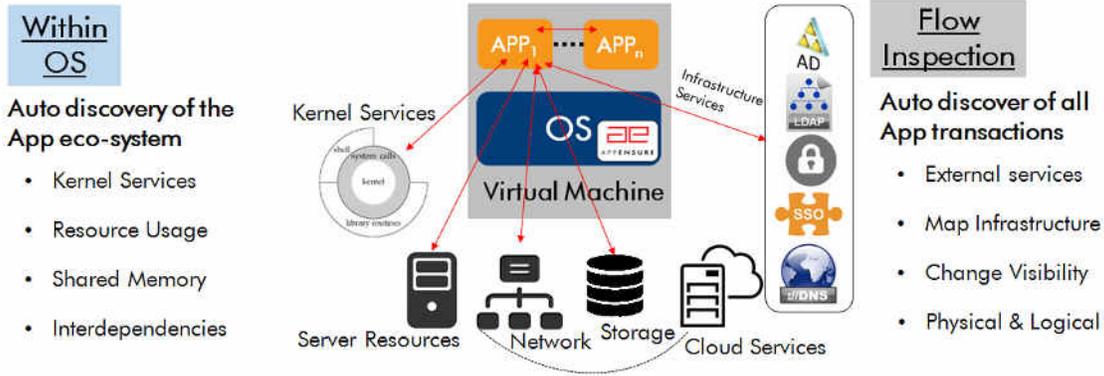


AppEnsure Agent Functionality

- Inspects all application traffic layers 3-7; every packet inspected, header and payload
- Maps specific infrastructure elements supporting the application transaction
- Builds a database of all transaction response times
- No flows terminated; no latency and cannot interrupt a service
- Constructs contextual flow statistics; does not keep customer data



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Full Stack Visibility

AppEnsure has full stack visibility from layer 3 to layer 7, networking and storage. This is how AppEnsure builds the topology map and can follow all transactions through the stack from end to end. AppEnsure performs deep packet inspection at layer 3, opening every packet, header and payload, and extracts the key information showing the path of the transaction. It also looks up to layer 7 to extract the key 'conversational' data to allow us to understand the application's interaction and builds a workflow. While there may be many thousands of different transaction flows between an application and the infrastructure, AppEnsure can differentiate the application flows and map them contextually.

High Availability and Redundancy within Agent

An AppEnsure Agent comes with in-built high availability. An Agent comprises of three services: agent service, diagnostics service and update service. The triangulation between these services allows the Agent to be always up and running and ensures the service is brought up if any of the services were to be stopped.

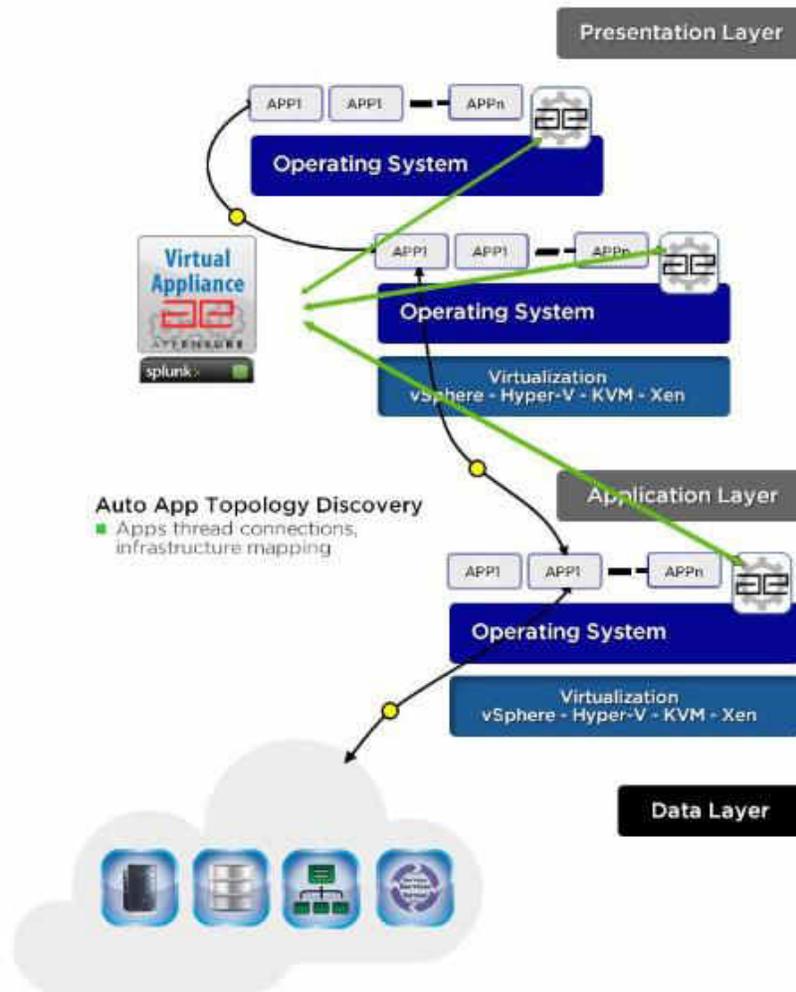
Agent Self-Policing

AppEnsure agents constantly monitor the resources being consumed on the server and are self-policing. Agents consume only 1% - 2% of any resources on the server and do not require any hard disk space on the server since no data is stored by the Agent on the server. Typically an Agent sends between 5M – 10M of data per 24 hours to the Master. If an Agent detects that it is consuming more than 5% of any resources on the server, then the Agent throttles back. It reduces the frequency of metric collection and reporting to the Master so that it will not cause more stress on the server resources. An Agent in these situations goes into safe mode and returns back to running mode when the Agent determines that its functioning will not load the server resources. When Agent is in Safe mode, the data is collected and analyzed at lesser frequencies than every minute.



Auto Mapping of Topology

As applications start interacting with each other to build a workflow, AppEnsure builds this topology and understands end-to-end and hop-by-hop topology of the virtual and physical infrastructure. As the database of these interactions builds, the historical response time analysis is measured over multiple time windows of varying lengths and stored for comparison against the next transaction measurement.



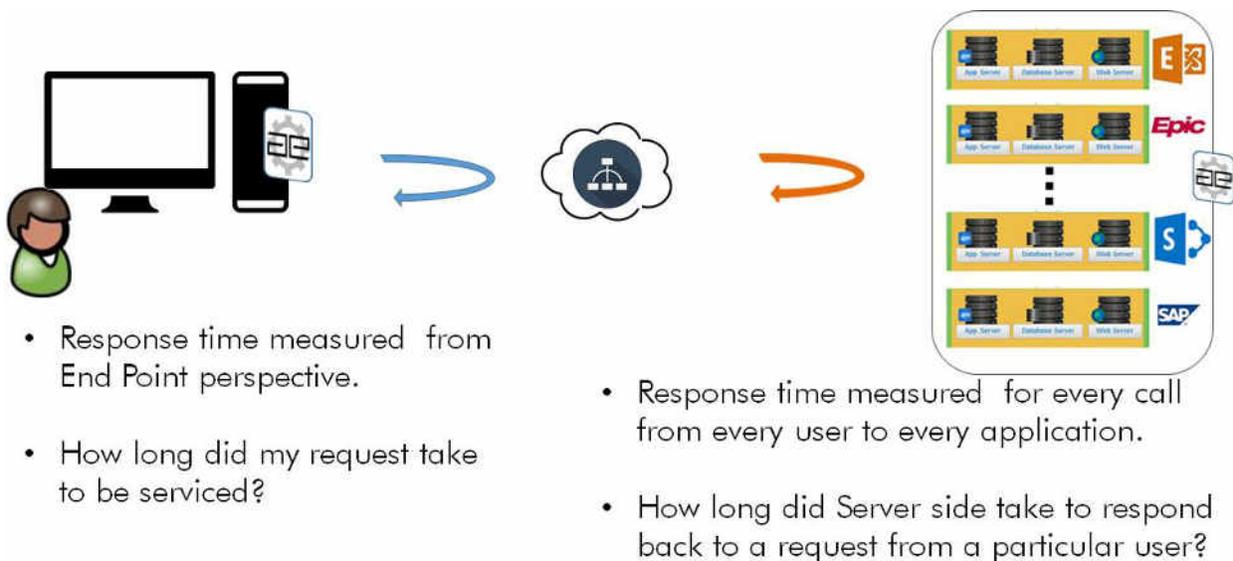


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Real-Time End User Experience

In addition to the server agents, AppEnsure also utilizes desktop agents. Desktop agents allow you to view application performance from the end user perspective and their access to the application from the endpoint. The end user and application views are sent back to the Master for event correlation, root cause analysis and resolution proposal.

When desktop agents are installed, detailed visibility of what applications the end user is accessing and how they are responding to the user is provided with bifocal visibility – as seen from the server as well as seen from the end user side. In addition, typical end device metrics like CPU utilization, memory, disk and network usage are collected.



Real End User Experience for Citrix Delivered Applications

Citrix XenApp/XenDesktop provide unified delivery platform enabling enterprises to couple cloud computing with application and desktop virtualization to realize the combined resource optimization, infrastructure agility and economic benefits from a single platform. Citrix delivery slowness affects user productivity and has a significant business impact.

AppEnsure, with its contextual Application Operational Intelligence gathered measuring end-to-end response time-based service levels, AppEnsure uniquely correlates the application delivery view with that of the end-user. AppEnsure relies on real transactions (not synthetic) to provide actionable intelligence. This empowers our customers to proactively anticipate, troubleshoot, resolve, and prevent performance issues in the most complex Citrix XenApp and XenDesktop environments.

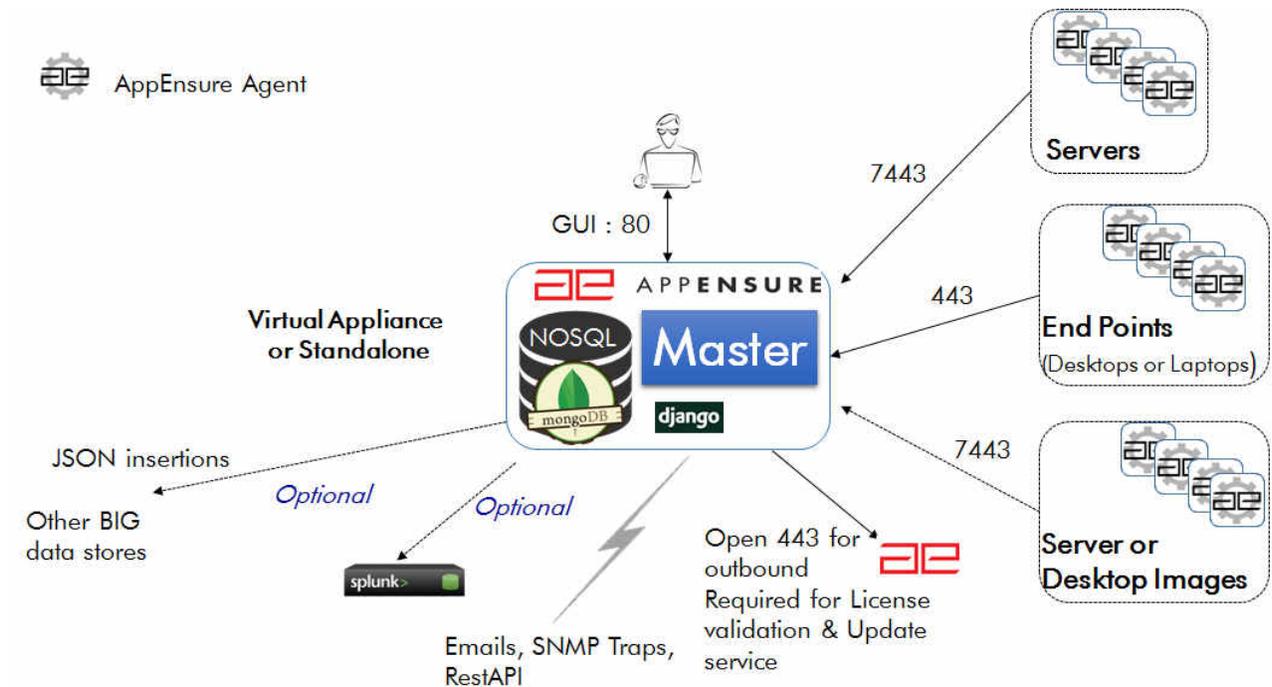
AppEnsure provides:

- True end-to-end visibility beyond the Citrix silo
- Auto correlates each user’s access of backend infrastructure
- Backend response time for each user for every application accessed



AppEnsure Master

The AppEnsure Master is provided as a virtual appliance which stores and presents data from the agents. A web browser is used to access the AppEnsure console through the Master.



Diagnostics

When an event occurs, AppEnsure automatically does correlates across all related (and unrelated) threads to look for correlating events. This is a major part of the analysis for root cause. These mappings and correlations are updated automatically in a dynamic environment as applications are spun up or down.

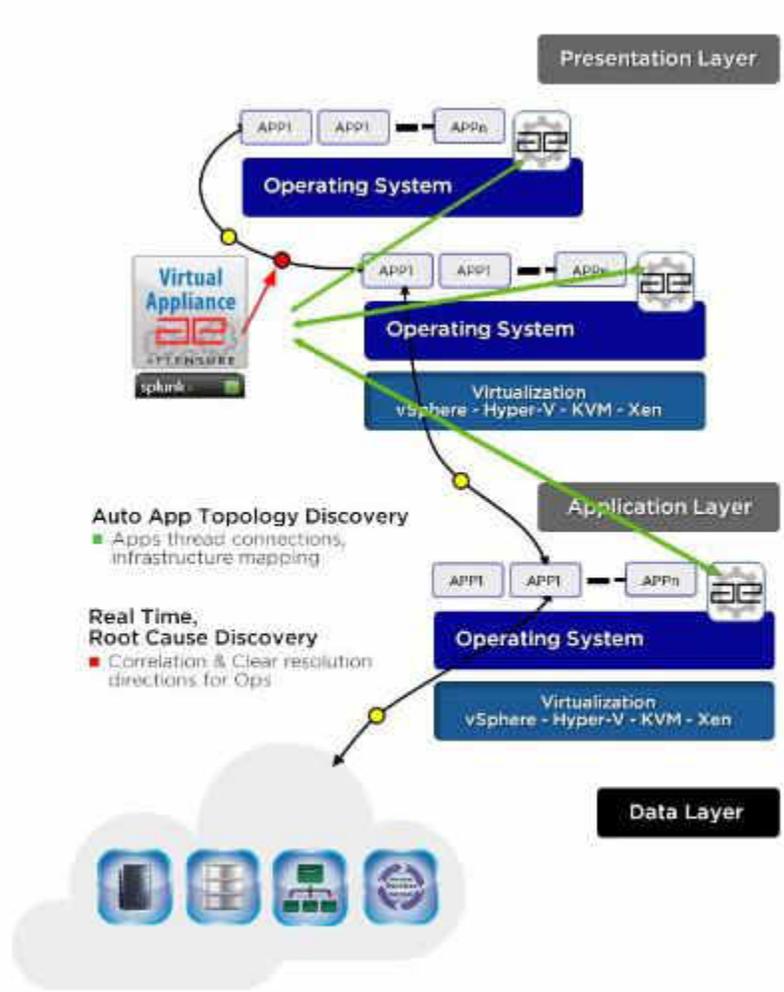
As deployed, AppEnsure uses a sophisticated anomaly detection algorithm to automatically assess when a response time excursion is valid, then deep diagnostics are triggered to analyze the event.

In addition, the hop-by-hop segment latency is compared against the historical norms to identify deterministically which segment has extended latency and reduced application performance.



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Based on many thousands of stored instances and rules, which are continually being incremented by machine learning, the root cause analysis of an event can be deterministically established. This triggers a proposed remedy for IT Ops to restore service to the expected SLA.





Functional Overview

AppEnsure provides a constant view of the data center ecosystem from an application perspective and monitors its performance. Top features of the AppEnsure product include:

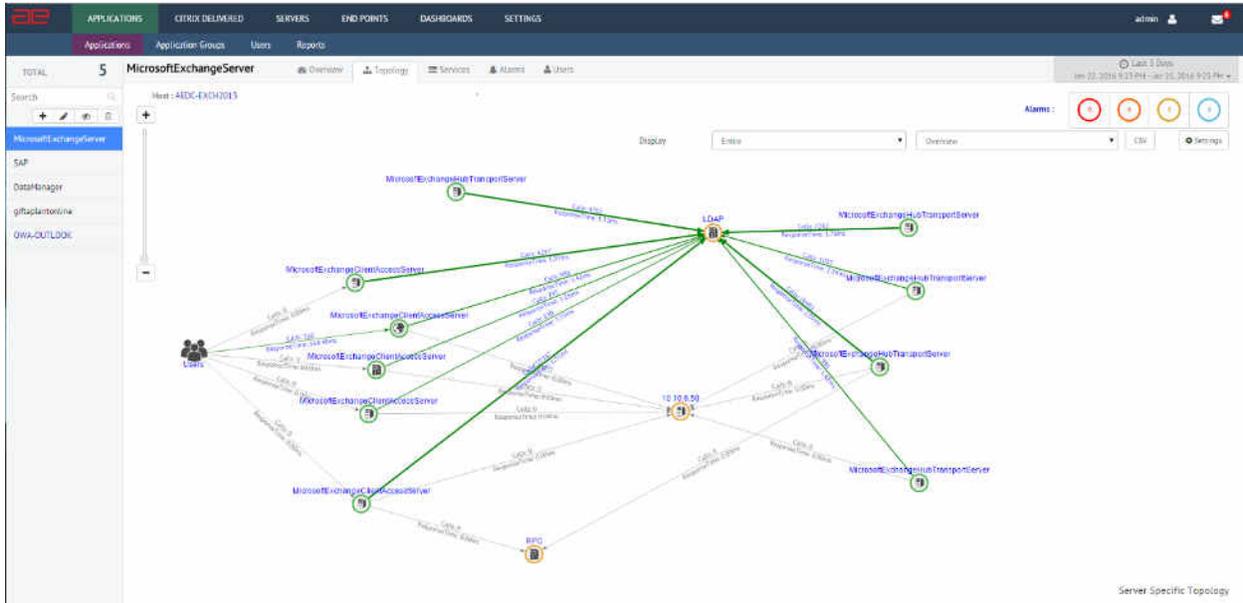
- An executive dashboard with a system-wide summary of every application, users and alarms. AppEnsure gives you an overview of all your applications and how they are performing in a quick glance.



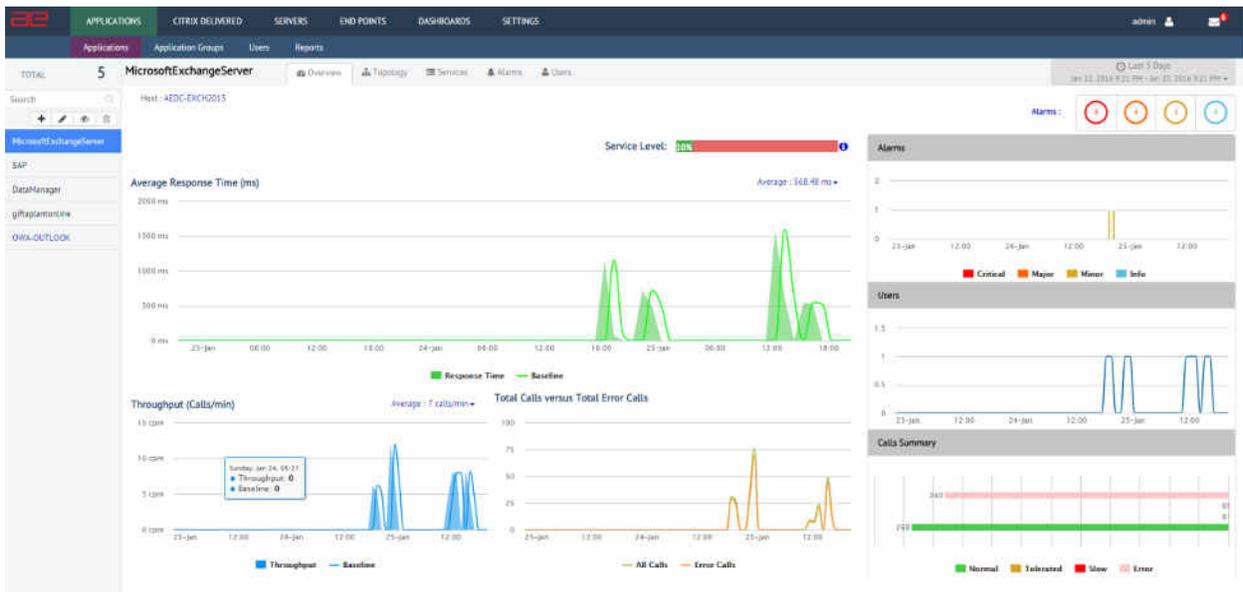
- Application Operational Intelligence that provides real application service levels and IT services.

Application Name	Instances	Service Level	Users	Alarms	Cells	Enter Cells
MicrosoftExchangeServer - DataManager	1	100%	2	4	54611	—
SAP - gllrayantonline	1	100%	2	3	2907	—
DataManager - OWA-OUTLOOK	1	11%	2	5	464	—
gllrayantonline - SAP	1	14%	1	5	18676	13714
OWA-OUTLOOK - MicrosoftExchangeServer	1	—	—	5	—	—

- A dynamic, application topology map highlighting the specific hops deviating from normal behavior. AppEnsure automatically maps the virtual and physical topology of each application to give clear visibility of all transactions through all tiers of the application and infrastructure.



- Visibility into each application running by server with the specific performance data for that instance. The data allows the combination of application performance and server performance for overall instance performance. As alarms are flagged, AppEnsure will in real time display the root cause and proposed remedy to return the instance to the desired performance or SLA.



With today's agile development tools, applications are no longer monolithic chunks of code as they were in the past but are broken into multiple elements that run on various servers to complete a workload. Any one of these applications can become the point of failure or sluggishness for a transaction which results in abandoned transactions resulting in revenue loss.

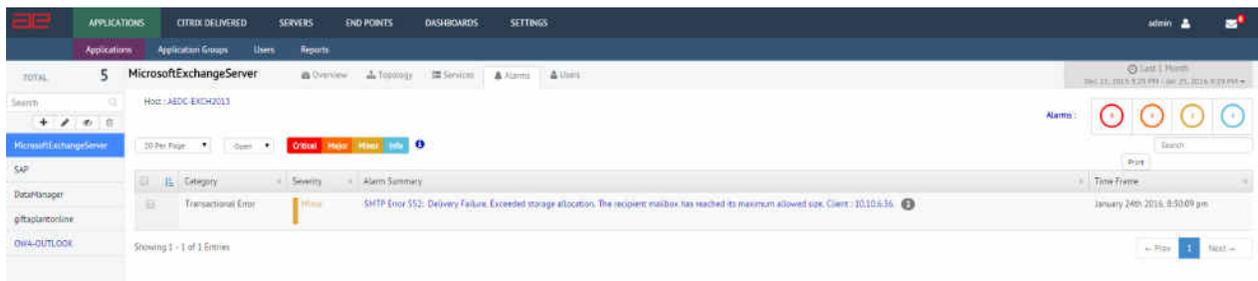


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Application performance management and engineering for the application tier and the storage tier is where the complexities are involved and requires a unified approach that is non-existent in other management tools. AppEnsure focuses on providing solutions that deliver unified relational visibility of all tiers of the environment in both application and infrastructure, but from the application perspective. Without this bi-directional view it is difficult, if not impossible to see where all events are occurring in real time.

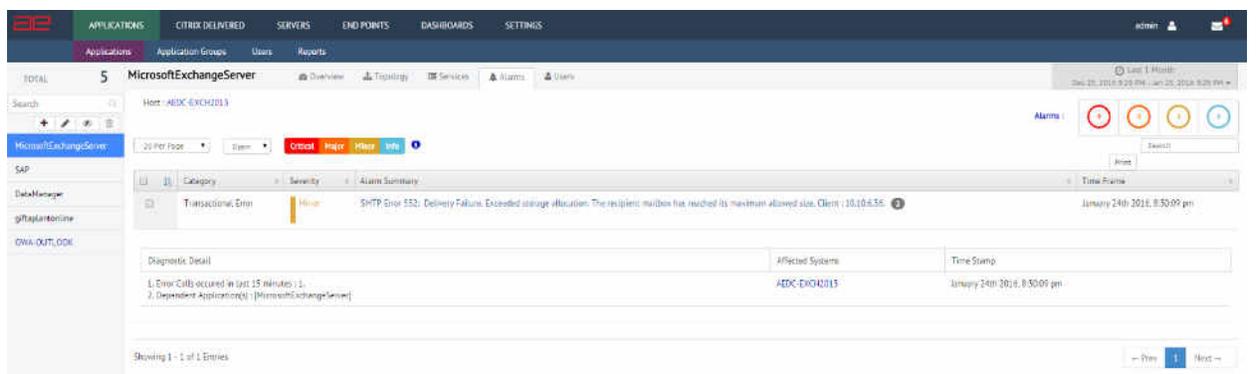
Many solutions in APM space collect information and provide the capability of monitoring the resource usage, usually as snapshot measurements periodically. This can be, for some tools, as often as every five seconds, but for many complex tools, it can be as little as every two minutes otherwise the processing burden is so intense it degrades performance considerably. This snapshot information without the context of all other metrics cannot provide a full analysis.

AppEnsure delivers the full behavioral profiles of both application conversations and calls and infrastructure responses and performance which is critical to understand fully what the overall performance is based upon.



Based on many thousands of stored instances and rules, which are continually being incremented by machine learning, the root cause analysis of an event can be deterministically established. This triggers a proposed remedy for IT Operations to restore service to the expected SLA.

AppEnsure uses the event correlation output to deliver the targets for detailed examination and root cause analysis of the events. This allows the tool to then perform a deep dive on the correlated events to enable the root cause analysis to identify the real issues rather than just the symptoms.



One of the main challenges today for data center management is extracting the necessary data from the vast amounts of data collected. In surveys of mid-sized enterprise data centers there are on average between 30 and 50 APM tools in use, each usually providing its own dashboard. The real challenge is how to correlate all the data and dashboards in real time to extract real intelligence from these metrics and authenticate it. AppEnsure automatically gathers information

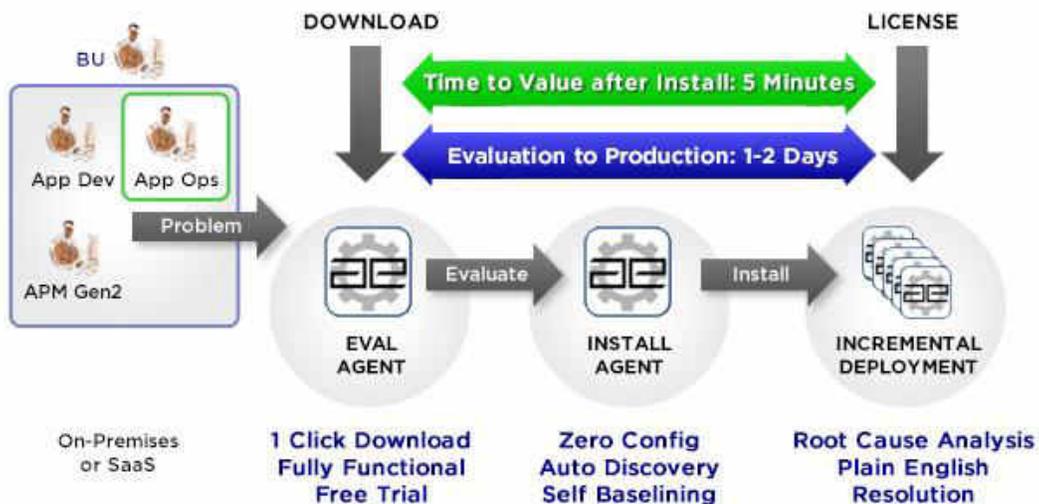


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from all the sources to which it has access, including broadcast metrics, in addition to building the unique metrics from the derived flow intelligence without any human intervention in this process. Then, it correlates all the relevant data to create the actionable intelligence specific to the target application.

Ease of Installation

AppEnsure is a 1 click download with no configuration required to start delivering value. It takes around 5 minutes to build the initial topology and transaction map. A free evaluation trial is free and runs on a standard Windows or Linux server. The deployment of agents to the environment is automated, just advise which servers (or all) you wish to apply it to. Dynamically discover application performance visibility for all application, showing all instance response times and overall throughput for an entire deployment.



Next Steps

One of the most attractive features of AppEnsure is how simple it is to install and use. If you're intrigued by the information in this overview and have been experiencing the frustration of application performance issues, download a free trial for yourself and your company. This will give you the opportunity to experience firsthand how AppEnsure ensures your entire application portfolio's performance by providing most meaningful and actionable intelligence.

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