



An ENTERPRISE
MANAGEMENT
ASSOCIATES® (EMA™)
White Paper

October, 2019

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Virtual Instruments is Now Virtana and Has Set Out to Optimize Operational Cost and Risk in the Data Center and Public Cloud

While users enjoy talking about multi-cloud, microservices, and Kubernetes, they often forget that approximately 80% of enterprise applications and an even larger share of mission-critical application workloads are still on-premises. These workloads are often tied to a specific set of host machines, typically requiring specialized staff and tools for silo-specific infrastructure management. Many of these traditional enterprise apps are not part of the corporate continuous delivery pipeline, living in a “parallel universe” that requires dedicated management tools and specialized operations staff. At the same time, cloud-native development and DevOps teams have created their own rapidly expanding universe, coming ever closer to automated release processes, near-instant rollback, and full observability of end-user interactions with individual microservices to inform the next incremental feature release.

The Future is Hybrid

Instead of wholesale migrating of their applications to the public cloud and a container-based delivery model, most enterprises are looking at a hybrid model, in which modern microservices expand the capabilities of traditional enterprise apps.

Efficiently deploying and operating these hybrid applications on top of different architectures, such as bare metal, hypervisors, Kubernetes, or “serverless” APIs located in the corporate data center, an off-premises colocation facility, or the public cloud, constitutes the next frontier for DevOps and enterprise IT.

Chart 1 shows that despite a high level of interest in public cloud technologies, enterprise customers regard private and hybrid technologies as a critical part of any public cloud conversation.

This Enterprise Management Associates (EMA) white paper explores how Virtana, formerly Virtual Instruments, can help customers manage and optimize the cost, performance, availability, and capacity of mission-critical hybrid applications, independently on their deployment architecture and hosting model.



Chart 1: Visualization of 10,000 Tweets on “Public Cloud”
EMA analyzed 10,000 Tweets from October 14, 2019 on the topic of “public cloud” and received a word cloud showing the importance of private and hybrid cloud aspects within the context of public cloud.

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Two Worlds Within One Enterprise

In many enterprises, there are two separate worlds when it comes to infrastructure operations and management.

1) Traditional corporate IT

Enterprises are working on getting corporate IT to the table when it comes to cloud-related decisions. However, there are often too many silos and manual processes for corporate IT to help the enterprise achieve the velocity that is required for digital transformation.

2) Modern, cloud-native DevOps

Cloud-native development teams often assemble their own distributed application environments that are optimized for deployment speed, flexibility, and comprehensive API access. This places the challenge on enterprise IT to bring these environments back under corporate governance to re-establish control over SLAs, performance metrics, cost, compliance, and security.

Escalating Complexity Through Application-Specific Infrastructure Choices

In the average enterprise, there are more worlds than the two described of enterprise IT, as both traditional corporate IT and modern cloud-native DevOps teams tend to bring in their own preferred technologies for each new application. This often leads enterprises down the road of creating a second, yet equally detrimental, “legacy hairball” of numerous cloud, server, network, and storage platforms, with a plethora of different operating systems, structural and NoSQL databases, and middleware frameworks. Chart 3 demonstrates how different Kubernetes-related infrastructure technologies have stacked up in the data center (each technology is represented by one colored layer).

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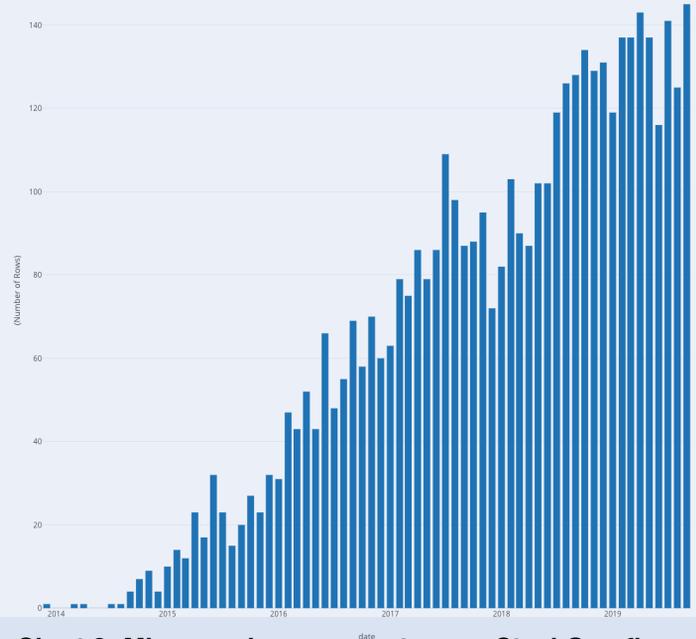


Chart 2: Microservices momentum on StackOverflow
EMA research based on the quantitative evaluation of the StackOverflow developer forum shows that developer activity around microservices has nearly doubled over the previous 12 months.

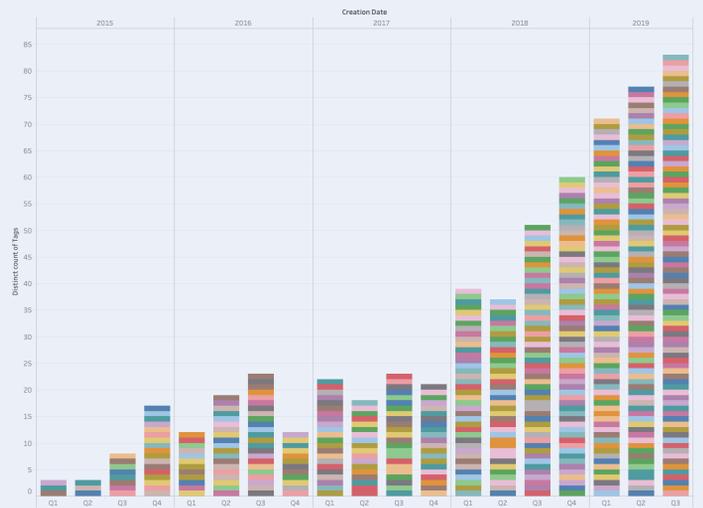


Chart 3: Technology complexity on ServerFault
Based on the quantitative evaluation of the ServerFault IT support forum, EMA research has found that in Q3 of 2019, IT operators are dealing with four times more infrastructure technologies compared to Q1, 2018.

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Virtana's Vision is Clear and Simple: Connecting the Dots Between Applications and Hybrid IT Infrastructure

AIOps has been claiming the spot of the “cool kid on the block” when it comes to applying advanced analytics and machine learning to identifying relevant outliers and trends at an early stage and without significant human intervention. Virtana's vision builds on the AIOps principle, but is able to address its key weaknesses due to the company's deep roots in real-time infrastructure monitoring and analytics. Virtana offers a suite of products for performance monitoring, capacity and cost analysis, and workload automation for both private and public cloud deployments.

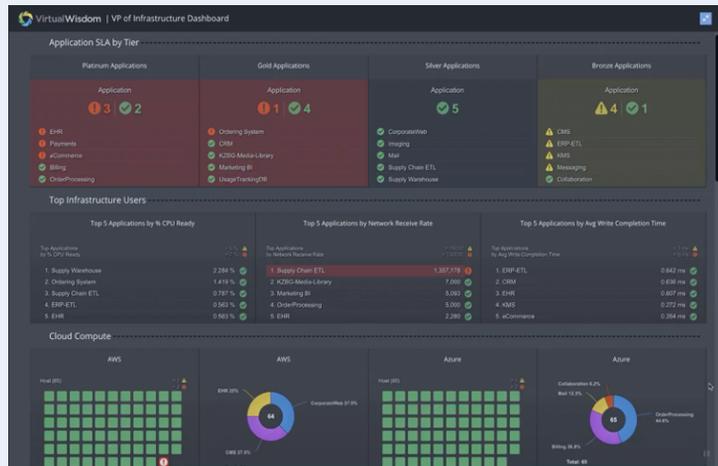


Chart 7: Virtana VirtualWisdom - One dashboard for infrastructure and applications

Virtana's key capabilities include:

- **Granular and real-time infrastructure metrics:** Advanced analytics and machine learning models can only be as good as their input data streams. This is where Virtana benefits from Virtual Instrument's heritage in delivering a large number of granular real-time metrics that monitor data flows across every server, switch, and storage array within the context of the business applications they are driving.
- **Peak metrics:** The ability of leveraging peak metrics in addition to traditional metrics that are typically averaged out over seconds or even minutes has become critical in the days of subsecond startup times of containerized or serverless applications. Without the ability to monitor these peak metrics, root cause analysis within dynamic modern application environments can be much more difficult.
- **Understanding how applications relate to infrastructure:** Virtana's app-centric approach knows where applications live on the infrastructure, their relative business value, and how workload changes impact infrastructure response times. Chart 5 shows how Virtana's VirtualWisdom platform connects the dots between applications and a granular set of server, network, storage, and cloud compute metrics.
- **One monitoring platform for server, network, storage, hypervisor, and public cloud:** Virtana's ambition of becoming the centralized hub for all health and performance metrics, log and configuration data across the application stack, and also between different application stacks, should be seen as the company's key differentiator. EMA spent the last two decades helping enterprise clients find a path out of their siloed approach toward application-centric infrastructure. Therefore, EMA applauds Virtana's ability to lay everything out onto a unified view of the hybrid infrastructure. Virtana's VirtualWisdom automatically discovers infrastructure and maps the applications to the infrastructure, visually accessible in a comprehensive topology view.

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- **Cloud migration services:** Most enterprises already have experienced a degree of difficulty when it comes to moving complex workloads to a public cloud. While everything seemed to have gone fine at first, many of these pioneers of digital transformation had to scramble when problems occurred that were due to specific workload characteristics that, combined with specific public cloud infrastructure characteristics and customer usage patterns, led to disaster. Virtana's Cloud Migration Readiness service lowers this risk by observing the impact of an application on its environment and vice versa based on a customizable amount of time, and then creating a simulation of this workload for customers to try out on their preferred public clouds. It provides both performance and cost/performance analysis reports in advance of any migration.
- **Cost and capacity management:** Based on infrastructure and application performance metrics, Virtana offers capacity analysis and forecasting across both public and private cloud environments. This is interesting for enterprises that are struggling to compare the cost of running an application on existing data center infrastructure that might be underutilized versus running the same app on a spot instance or a reserved instance on Azure, AWS, or Google.

EMA Perspective

Overprovisioning in public cloud and the data center is often regarded as an insurance against SLA and performance challenges, especially in the public cloud. This trend toward "buying insurance" through overprovisioning CPU, RAM, and storage has led to an average of 50% in wasted capacity. To make things worse, public cloud overprovisioning often turns out to be an insufficient "insurance policy," since enterprises do not exactly understand the performance bottlenecks of the various public cloud t-shirt sizes on the one hand and their own application's peak resource performance requirements on the other. This challenge becomes even trickier in a world of hybrid applications that partially rely on traditional middleware stacks, and at the same time are leveraging capabilities provided through microservices. Without exactly understanding how these hybrid applications scale, there is a significant risk of manually or automatically scaling the environment in a seemingly generous manner, but without the actual application being able to benefit.

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Virtana persistently measures and correlates infrastructure and application performance metrics so customers do not have to make guesses about, for example, the database latency that is caused by the black Friday crowds going crazy about an online deal. At the same time, these customers receive exact information about how database latency influences the overall application performance. Why does this matter?

- 1) Understanding cause and effect:** The application might be written in a manner that tolerates database latency up to a very high threshold. Therefore, users might be able to safely ignore a temporary increase in database latency, instead of adding infrastructure resources.
- 2) Understanding the fine print of public cloud:** Adding more disk capacity or memory still might not decrease database latency, for example, due to a networking bottleneck between EC2 or Azure server instances. To truly eliminate the latency spike, the enterprise might need to migrate the database to a different infrastructure cluster that guarantees higher IO throughput between nodes.
- 3) Understanding the real infrastructure footprint of an application:** Knowing an application's infrastructure consumption patterns is critical when planning the move to a public cloud or even to locally hosted Kubernetes clusters. Especially when migrating traditional applications to a container architecture, it is critical to exactly identify its resource footprint and understand how this application will respond in the case of a specific type of resource contention.
- 4) Making use of old and new infrastructure:** While fibre channel SANs and clustered NAS infrastructure may no longer be high-growth markets, they are still present in most large enterprises. The ability to optimally balance these premium storage networks and arrays and, in case of underutilization, leverage them to fill out performance gaps instead of having to add on more public cloud infrastructure, can lead to significant cost savings.

Virtana aims to bring users closer to the original dream of autonomic computing, where systems self-heal and evolve based on application and business requirements. The reason why autonomic computing remained an unattainable vision was not due to a lack of machine learning or AI capabilities, but the challenge lay for the most part in the siloed approach toward IT operations. Virtana aims to provide one unified AI-powered hybrid infrastructure monitoring and management platform across all of these data center and cloud silos. It is the ideal foundation for gaining the insights that are needed to forge proactive, automated issue resolution and infrastructure optimization.