

Mastering the Challenges of  
Application Services Management for  
the Extended Enterprise  
Corente Session-Based Management

A Corente White Paper

## Introduction

What is causing poor application services performance for end users in your extended enterprise?

- Is it the network?
- The server?
- The application?
- Rogue or lower priority applications consuming all the bandwidth?
- Etc.

How can data center managers quickly tell the difference and apply remedial actions? Or better yet, how can business policies, rules and an active policy directory create an autonomic infrastructure to take remedial actions without the need for human intervention?

By eschewing the traditional fragmented approach to services management in favor of a proactive, self-healing, session-oriented approach to application delivery management, IT organizations can gain newfound control of the end user experience for critical applications. By performing business-relevant monitoring and surveillance of key applications, IT organizations can anticipate and diagnose service interruptions before they are perceptible to the end user, eliminating costly downtime, reducing if not eliminating remediation cycles, and greatly improving customer satisfaction.

The Corente Virtual Services Exchange (VSE) enables autonomic application services management by providing a platform that enables end-to-end session management, eliminating the shortcomings of traditional application performance management and network device management tools. Corente's VSE eliminates blind spots that result from the complexity of multiple tools and isolates *potential* trouble spots related to application services for swift mitigation with full instrumentation and surveillance. At the same time, Corente's VSE creates an unbroken custody chain across diverse networks and network elements to ensure compliance, while eliminating the manual process integration prescribed by ITIL service management frameworks.

## Traditional Application Performance Management Tools and Their Limitations

Monitoring end-to-end performance of distributed applications is one of the most difficult, frustrating and expensive tasks facing IT managers and executives. The tools they have traditionally relied upon—application response time tools and device-based system management tools—are proving inadequate to deal with the variety and volume of application traffic for today's extended enterprise network environments. These limitations often make it impossible for IT teams to quickly and economically isolate and fix performance problems.

Many application performance tools rely on agents distributed across the network infrastructure. These agents use active monitoring (i.e., synthetic transactions or test transactions) to check the response of applications, and are often capable of delivering detailed information about application performance and transaction performance. While these tools can test to see overall, end-to-end response, they do not provide information about the other key elements affecting performance: the server, the network device, the application or other traffic on the network. Nor can they easily identify the impact of other traffic on application performance.

While agent-based tools are inadequate because they cannot isolate the critical components of application performance, device-based system management tools track the status of the devices involved but not application performance. Even combined, these tools do not provide a holistic view to track every location and application, because the deployment, management and coordination of required devices and agents are extremely expensive, complex and time-consuming. Traditional tools just do not allow IT teams to deal efficiently, in real time, with application performance issues.

Finally, today's traditional application management systems are often *batch* systems monitoring and reporting on *real-time* systems. These tools worked well with traditional infrastructure when the entire applications infrastructure and data traffic patterns were fairly predictable. These "batch-oriented" collection and correlation systems could be used to monitor and manage "on-line" systems. Today's applications traverse infrastructure that is *controlled but not owned* by the enterprise data center manager and, as applications connectivity is expanded out to partners and suppliers, it is often *neither controlled nor owned*. Systems and applications are increasingly becoming real-time, each with a different sensitivity to resource availability. There is both business sensitivity (e.g., POS and debit transactions have higher business sensitivity than email) and performance sensitivity (e.g., VoIP has higher performance sensitivity than web browsing). Batch tools will never be able to effectively address these growing real-time needs.

Today's dynamic, extended enterprise architectures require a different approach: an approach that provides embedded instrumentation and surveillance capabilities for business relevant, threshold-based monitoring and event-driven applications prioritization, alerting and notification.

## **Corente's Session-based Monitoring and Performance Management**

*"Our partnership with Corente extends Tivoli compatible management capabilities deep into the network fabric and allows data center managers to manage their networked applications using a single set of tools that are akin to the advanced data center automation tools that they already use."*

*- Mickey Nix, Architect, IBM Tivoli*

Fortunately, there is a solution. The session-based technology of the Corente's Virtual Services Exchange (VSE) enables data center managers and IT staff to immediately identify the source of application response problems so the right team can begin to fix the relevant problems before the customer notices a service interruption. It combines active policy based management elements with session-oriented passive monitoring to provide a complete diagnostic view of application services.

A session is an end-to-end application connection, across any IP network, between two business entities: a resource provider and a resource consumer (e.g., application and user, server and/or client). As opposed to traditional application monitoring solutions, Corente simply and non-intrusively monitors every packet and every session—and thus every connection—between business entities.

The Corente session-based applications and system management technology provides performance visibility into the application, server and network components—across any network type. This enables

IT staff to immediately identify which component or components of the end-to-end delivery system are responsible for performance problems that affect key business processes and user productivity.

The Corente approach scales easily to fit even the largest, most complex global networks. Corente's active policy directory maintains the link between the business, the application and the network. Even as the network evolves, the policy defined links adapt automatically via Corente's centralized, automated management system so that time-consuming configuration changes to its alerting, monitoring and reporting features are not required. Moreover, while Corente's VSE is able to work with them, the solution requires no outside agents, SNMP, RMON-2 or probes. The Corente Application Services Gateway itself can be configured to test applications and their servers through synthetic transactions.

Equally important, the Corente management system delivers monitoring information—and many other important metrics—in the context of its business importance, allowing managers to easily prioritize problem response. By itself, the session data supplies detailed information on performance and utilization; other information, from active monitoring, can be correlated with the associated sessions to integrate route data. Finally, Corente's VSE provides a secure and complete audit trail of all Corente Application Services Gateway to Corente Application Services Gateway connections, remote client connections and administrative activity.

## Key Comparisons

The following examples highlight the key differences between the traditional approach to application performance management and Corente's session-oriented approach for the extended enterprise.

### Fragmented vs. Unified View

Traditional solutions typically provide a segmented or fragmented view of distributed applications' performance. No single traditional management system supplies all the types of service metrics needed to manage the new business ecosystem. These service management metrics include:

- Usage/utilization
- Network performance
- Server performance
- Client performance
- System provider performance
- Route performance

Instead, each type of system focuses on certain kinds of problems, and is blind to problems arising elsewhere along the end-to-end path that defines application response and thus user experience.

For this reason, separate IT teams in the same organization use a different type of tool: network management tools for networking teams, and systems management tools for application teams. The result is the bane of CIO's everywhere: organizational conflict, finger-pointing, lack of cooperation and far too much time wasted in long fault isolation and resolution delays caused by teams

troubleshooting problems that turn out not to be within their management purview. Additionally, the large number of point solutions and the dedicated staff needed to manage them can get quite expensive, and creating an audit trail of changes for compliance and governance purposes is difficult. More recently, organizations have attempted to address this challenge by implementing ITIL best practices via IT services automation. This approach, known alternately as IT service management or business service management, entails a great deal of work to integrate IT staff, processes, and tools. As a result, organizations must spend a great deal of time and money on new technologies such as IT asset management systems and configuration management databases to improve responsiveness to end users—not to mention the costly integration and maintenance work that must occur when business requirements change. This approach is basically a stop-gap for a much broader problem, which becomes completely moot with a unified SaaS solution that maintains and enforces policy for application services from a single point of control.

Corente's session-based system delivers a unified view of all the key metrics needed to manage the new business ecosystem, end-to-end. This helps eliminate finger-pointing, promotes collaboration, identifies and eliminates emerging issues before they become problems and accelerates mean time to fix when problems do emerge and reduces cost and complexity.

With all the information obtained from the sessions available in one place, a session-based system such as the Corente Virtual Services Exchange (VSE) can immediately identify a problem as originating in the server, network or application, thus enabling the related IT teams to zero in on it. In many cases, a session-based system's ability to supply all six performance metrics mentioned above obviates the need for additional management systems or enables their consolidation, releasing IT budgets for other uses.

### Technical Complexity vs. Business-Relevant Data

In traditional solutions, data from device-based management tools do not naturally correspond to business relevance, making it difficult to prioritize issue response. A router may carry traffic representing hundreds or thousands of transactions—but which of them are critical to the business? A server may be accessed by many different users, business partners, or customers—but which of them is most important? Lacking this knowledge, how can IT staff efficiently prioritize their response to problems? Some systems allow the user to specify which devices are part of critical business paths, but that requires laborious reprogramming when the infrastructure changes. Corente VSE sessions are inherently business relevant, making it easy to prioritize every issue and response. The nature of a network session—a conversation via a specific application between two business entities—makes it a natural representation of a business relationship. Corente allows you to assign simple names—and, therefore, business significance or relevance—to the endpoints and applications identified by the IP address and port information in packet headers. These names allow Corente VSE to easily represent network events in terms of business priorities: what application is involved and what business unit, partner, or customer is affected.

### Blind Spots vs. Visibility into Every Component of Application Performance

There are many parts of modern enterprise networks that the network and application management systems of traditional solutions cannot see. Device-based management tools require access to information from the network that is only available if you own it. This information is not available from the public network or the networks of business partners or customers, and therefore these networks

cannot be instrumented with RMON probes or be configured to provide SNMP information to a third party. Even if your service provider or business partner were to provide such data, your traffic would likely cross three or four other networks before reaching its destination. You simply are unable to instrument and monitor all possible network paths with a traditional solution.

Even when a network is fully instrumented and no devices are operating below par, performance can still suffer: you cannot assume that if all the devices supporting a system are working well, the system is working well. To the contrary: it is the interactions of network traffic, users, applications, and system providers that determine how well an application is performing—and those interactions cannot be seen by monitoring individual devices in the network.

Application performance tools are less troubled by this last limitation, since they measure performance using synthetic transactions without recourse to element data, and so can measure performance across (but not within) a network you cannot instrument. However, these tools see only the applications that you pay to monitor, and cannot measure the impact of those applications on your other traffic. Within these limitations, agents can deliver valuable data—as long as they are correctly placed, which caveat arises from a limitation shared by all device oriented systems: sampling error (discussed in the next section).

There are no blind spots in a Corente Applications Network. A session is an end-to-end phenomenon; the end-points are identified in the IP portion of the packet header. This means that a session can be seen from anywhere along the path it travels. A session-based system is thus not dependent on any form of instrumentation in remote networks.

### Batch vs. Real-Time Monitoring

Given that the real-time interactions of many different components of the applications infrastructure and their usage dynamics vary greatly, only by monitoring, controlling, and prioritizing the applications in real time can one ever hope to optimize the end-user experience and the business value within an applications network. To that end, Corente gives application and network administrators the tools to easily change the priority scheme at the point of control to respond to changing business needs.

By embedding instrumentation into the session itself, intelligence on applications can be automatically gathered and immediately made actionable. Administrators can achieve the Holy Grail of application management—*real-time monitoring and real-time reporting*—combined with a mechanism to set priorities that optimize the applications experience in real time.

### Sampling Error vs. No Sampling Error

Sampling error in both application performance and device-oriented systems of traditional solutions limits their ability to detect application response problems. Sampling error is really just another limitation on network visibility, and has both a spatial and a temporal aspect.

#### Spatial

The distribution of agents (whether hardware or software agents) in a network cannot possibly cover all possible network paths, and therefore cannot reproduce actual traffic patterns. What you obtain is data on a fraction of the network paths actually taken by your traffic. This makes proper placement of the agents critical, which contributes to the scalability and maintenance problems all

device-oriented systems share. Also, synthetic transactions alone are inadequate since they cannot reproduce the exact nature of your actual application traffic and user behavior.

### Temporal

Most network problems are transient or intermittent. In fact, that is almost by definition the nature of the nagging problems that consume so much enterprise IT staff time, as steady state problems are generally easy to diagnose. In any system that depends totally on polling agents (whether on the server or in an RMON probe) or periodic synthetic transactions, the sampling rate must be kept low to avoid overwhelming the network with management packets or overloading the routers with non-packet processing tasks. At any practical sampling rate, these systems can miss many of the most difficult problems.

Corente's session-based system eliminates sampling error by monitoring every session both actively *and* passively. Sessions are monitored passively, simply by recording and aggregating the data from network packet headers. This adds no traffic to the network, no matter what the sampling rate. Given sufficient data-acquisition speed, Corente's VSE can "see" every packet and every session, and thus detect even very short-duration or highly intermittent network problems anywhere in the network. With the addition of active monitoring, a complete diagnostic picture can be formed. For example, if active monitoring tests are successful but passive, session-oriented monitoring is indicating a problem, you can be sure that the problem is not with the application but with the connectivity. Alone, neither active nor passive monitoring is adequate; combining the two results in much better application and network diagnostics.

### Device Dependence vs. Independence

Device-oriented tools are dependent on the underlying physical infrastructure like all traditional network management systems. This has several negative implications.

For one, these systems do not scale well. The more devices (or agents) in the network, the more information must be processed to make sense of its operation and to troubleshoot problems. It is difficult to manage a network with thousands of devices; there is simply too much data to interpret. And trying to get by just monitoring critical devices and paths dumps you right back into the sampling error trap.

Device-based systems are also hard to maintain. Device changes mandate management system changes to maintain visibility or business relevance, making it difficult to keep on top of things during network changes. New device features and capabilities may remain invisible to the system for months until the vendor supplies the necessary integration data. Even worse, when a new network technology arises such as VoIP, MPLS, or VPN, it requires a new management system whose data must then be integrated with existing systems.

The device-independence of Corente session based services management makes it highly scalable, requiring no separate investment or complex maintenance. As an end-to-end phenomenon defined and controlled by the IP protocol suite, a session is independent of the underlying physical devices. The information supplied by IP is the same whether the session passes through one device or one hundred. In effect, the Corente solution virtualizes the network in terms of relationships between sources and destinations. This enables Corente's VSE to scale and handle even the largest networks and still be easily maintained, as it is essentially unaffected by changes in the underlying devices.

The device independence is especially valuable during network transformations, such as the transition from a private WAN to a VPN, since a session-based system can maintain visibility of performance and furnish before-and-after comparisons throughout the change-over, from start to finish.

## **Conclusion**

Traditional application performance management tools suffer from complexity and fragmentation, requiring too many agents and devices to get a holistic view of network and application issues. This in turn creates difficulty planning for and dealing with the effects of network changes, and, when each IT team requires its own set of tools and information “silos” to obtain the data it needs, a lack of cooperation between IT teams. The end result is too much staff time wasted arguing and finger-pointing, defending against “network is slow” claims, and upgrading expensive device-oriented management software to accommodate network and feature changes.

The solution to this frustration is Corente’s session-oriented approach. Through visibility into every component of application performance across the global WAN, customers benefit from less guesswork, much faster problem identification and resolution, and the ability to verify usage claims and bandwidth requests from vendors. By not being tied to the physical infrastructure of the application network, the Corente’s VSE reduces the need for upgrades to existing management software and allows any network adjustments to be performed more efficiently. Best of all, Corente’s VSE can greatly improve IT staff productivity, unifying key metrics together into one monitoring solution and data store, thus allowing for better coordination and cooperation between IT teams. Through session-oriented application performance management, your business—and its critical applications—will run smoother and more efficiently.

## About Corente

*Corente enables the enterprise to have full control and optimization of their services delivery networks regardless of the underlying public and/or private IP network. The Corente Virtual Services Exchange is an integrated scalable multi-tenant suite of services that secure and simplify the delivery and management of applications and services to the extended enterprise. Corente's services management, fine grained control, and automated policy configuration based on service definitions are used globally by enterprises in over 63 countries to dramatically improve price performance and transform their IP networks into IT service exchanges.*

Learn more about Corente at <http://www.corente.com>.