

Achieving Effective QoE in Networked Application and Infrastructure Before Deployment with Shunra's "Virtual Enterprise"



Abstract

Delivering a high Quality of Experience (QoE) for business applications is the primary criterion for "customer" or "business success" for enterprises operating in national and global markets. This is true whether customers are internal or external to the enterprise or service provider, as both constituencies directly or indirectly affect revenue, brand perception and overall corporate performance. To achieve high QoE requires collaboration by both the application and networking groups in IT. Shunra's Virtual Enterprise enables collaborative processes across IT organizational silos throughout the development and deployment lifecycle of an application business service. As a result, malfunctions in the production environment can be minimized or eliminated, and high application QoE is achieved for new business services with reduced deployment time and in a more cost-efficient manner.

Executive Summary

Over the past few decades, various techniques for mission-critical application development and deployment have entered the arsenals of programmers and managers to make these dual processes more efficient. At the same time, there is an accelerated demand for high Quality of Experience (QoE) as internal and external consumers have become more selective and

more vocal about poor IT services. In parallel, the typical enterprise environment has become ever more geographically distributed, requiring service delivery over an ever-expanding geographical reach.

EMA and other research have shown that business executives have become increasingly aware that in such an environment effective IT operations are crucial to maintaining a competitive business advantage. Improving customer services and maintaining effective supply-chain processes depend on timely and cost-effective application development and deployment.

Shunra's Virtual Enterprise (VE) addresses the requirements to develop and deploy application services that yield targeted QoE using collaborative processes across multiple facets of the IT organization. The Virtual Enterprise enables users to develop, test, integrate, and troubleshoot new mission-critical application and infrastructure behavior from the production environment without risk to service performance. The Shunra VE allows business process or application owners, as well as network professionals, to see and feel application behavior over the Wide Area Network (WAN) as if they were remotely located. It also allows application programmers to experience remote application behavior from their workstations during the coding process. Shunra has incorporated comprehensive analysis and automation into the latest revision of its products- helping to bridge silos based on skill levels as well as organizational groups. Through this collaborative support for networked application-infrastructure lifecycle management, effective levels of QoE can be achieved and sustained to increase corporate productivity at a favorable cost to the enterprise.

Market Drivers

After all is said and written, the primary thing the CEO wants from IT is to nurture competitive advantage for business operations. Competitive advantage means delivering products or services reliably and cost efficiently to many satisfied customers located in a continually expanding geographical territory. In banking with custom office web-applications, for instance, access can be initiated anywhere in the world through Internet access, while the application processing the user's transaction may be resident in a geographically distant data center. Yet the user at that distant geographical location must experience the same high levels of transaction performance as if he or she were physically in the data center where the application is running. This demand for making geographical range transparent to the customer of a networked application service will be additionally challenged by the increasing

demand for supporting a growing range of application types in a converged world of voice, data and video.

The IT shop's contribution to competitive advantage cannot be measured by technology-centric parameters alone, but must focus instead on individual customer satisfaction. Understanding the reasons why this is so is partly common sense, partly economic pressure, and partly a matter of best practices in delivering and supporting IT services. From a common sense perspective, IT is recognizing that it must show itself to be an accountable provider of business-relevant services, or expect to be ultimately outsourced. In other words, it must become an internal service provider delivering value to its "customers." Moreover, a consumer of an IT service, whether internal or external to the business, behaves not as a modeled set of pre-defined technical metrics, but as a human being with complex and multi-dimensional perspectives on experience. Capturing these then requires recognizing that no single metric can suffice, but a great deal can be achieved through metrics such as service availability, service performance, consistency of service performance, and cost-effectiveness to the business.

From a best practices perspective, the realization that defining service goals in proper alignment with real customer requirements – is fundamental to IT success. Best practices, such as those put forward by the IT Infrastructure Library (ITIL), stress planning and validating service levels ahead of deployment, as well as customer dialog to ensure that the full complexity of customer experience is honestly addressed.

Business pressures to embrace QoE are also rising, as human behavior is increasingly extended and enabled through digitized means – whether for financial transactions, or for individual communication, or for gaining information, or for coordinating business plans. Because of this, business performance and IT infrastructure performance are becoming increasingly linked at the hip – making QoE in the delivery of IT services more and more a native expression of the quality of true business services, impacting revenue efficiencies, brand reputation, and internal morale and productivity.

IT can address QoE in large part through accurate insights into application performance in a networked environment through collaboration between the application and networking groups in order to assess end user perspective across the complete range of geographical locales. Through such collaboration each business application can be assessed in a consistent and effective manner. Network operations, QA, and application development can have common ground for making tradeoffs between application design and infrastructure readiness – from pre-deployment right on through production-level monitoring, tuning and updates.

Managing effectively to QoE requires establishing a core set of objective metrics that is superimposed upon customer/consumer expectations. For instance, in the case of a CRM (customer relationship management) application, appropriate latency, dropped packets, and other metrics can be established for any path in a given environment. Yet this does not guarantee a high user satisfaction because intermittent high load on a database where CRM knowledge base resides impacts adversely the environment. To achieve a high QoE, the network manager must assess application performance issues in a distributed network environment in collaboration with the application development team. Together, then, application development, network operations, QA and test, and pre-deployment staging personnel, from administrative through executive levels, can prioritize actions to optimize the performance. For the application programmer, objective QoE measurements can be of significant benefit while he/she is in the process of developing the application. For the Network Operations, QoE can be most effectively assessed in staging a new application deployment before the specific application is already committed and fully deployed. For a business, correcting a QoE performance issues during development and testing rather than in a production environment can bring manifold savings in cost and time. Moreover, a well-behaved application in a distributed environment can act as an incentive for further product/services development in direct support of expanding business outreach.

Shunra Virtual Enterprise Product Benefits

Shunra has provided an application and network service assurance technology for the past eight years. Shunra's Virtual Enterprise products focus on application-infrastructure lifecycle management in distributed IT infrastructures. The VE products address:

1. Objective QoE metrics are obtained by running a mission-critical application during development or acceptance testing processes using captured conditions of the production network environment without compromising it. The data is taken over a period of time, 30 days for example, defined by the user. Actual platforms executing the application can be attached to the "dynamic snapshot" of the enterprise, which exercises the traffic through the "virtual" network, its captured conditions, through to remote locations, and then tested for application metrics such as availability, performance, and consistency.

2. Using VE, application impact on the production environment can be determined early in the development lifecycle and the other way as well (i.e., production network environment impact on the application). Programmers can experience realistic application behavior in the production environment while developing the code. Similarly, network planners can view a realistic set of infrastructure performance requirements for a new application service before the application is deployed. Subsequently or otherwise, the fully developed application can be thoroughly evaluated for a wide variety of configurations. Deliberate stress conditions can be superimposed on the “dynamic snapshot” or virtual enterprise environment through Shunra’s VE. In this way, appropriate Service Level Objectives (SLO) can be predefined for both the application and the supporting network and infrastructure based on realistic application service performance prior to deployment.
3. By supporting collaboration among application developers, QA, Network Operations and management decision making, the Shunra VE products assure the development and delivery of superior application behavior in distributed networked environments
- d. Enhanced application service level assurance and troubleshooting can help to more quickly isolate and heal problems, without dispatching personnel, which is especially valuable when pesky intermittent problems occur at remote location.
- e. VE provides the flexibility to manage IT initiatives such as data center and server consolidation, disaster recovery efforts, business continuity, corporate governance, and other initiatives where changing service requirements and infrastructure issues are paramount. Addressing such landmark changes, as well as validating solutions and investments prior to actually committing dollars, can support more optimal management for business operations and finances.
- f. Service providers, such as business process or application outsourcing, systems integrators, managed services, development and testing outsourcing, and network and infrastructure consulting can also benefit from the ability to replicate enterprise client production networks and isolate issues. The VE can provide competitive advantages if incorporated into life-cycle processes to understand impacts, serve contractual SLA’s and meet deliverables on-time and within budgets.

Without “boiling the ocean” with complex simulations and expensive, cumbersome deployments, Shunra’s Virtual Enterprise solutions help IT achieve desired application QoE through a streamlined but well-focused set of capabilities. The enterprise achieves unique benefits as a result of this distributed infrastructure planning and application development process:

- a. The production network “dynamic snapshot” enables a realistic emulation of the actual production environment in a non-intrusive fashion. Actual application execution platforms can be connected to the “dynamic snapshot,” thus eliminating many potential “glitches” in accurately assessing the behavior patterns in the real production environment.
- b. Data reflective of real-time application behavior can be obtained as early as application code development, pre-development testing, integration, and acceptance testing for an eventual, disembarrassed cutover into production environment. This can help significantly in reducing time to deployment by discovering real-world performance problems early, while they’re still inexpensive to fix.
- c. The IT shop can accomplish tasks such as network base lining, capacity planning, and impact assessment more accurately and with a lower expenditure of manpower resources.

Shunra’s Product Description

The production network environment “dynamic snapshot” is a key concept behind Shunra’s Virtual Enterprise products. Shunra’s non-intrusive, appliance-resident software is connected to the production network and actual network behavior characteristics are collected into the “dynamic snapshot” (see figure 1). Subsequently, the application under development, test, or integration can be physically connected to the appliance, and its behavior can then be analyzed in the “dynamic snapshot” production environment without endangering the performance of actual production-level services. In addition, the appliance can emulate a variety of multiple stress conditions such as variations in latency or jitter to predict new application’s behavior under such conditions. A new application’s impact on the production environment can then be analyzed and evaluated. Because the “dynamic snapshot” captures live network conditions with actual applications and traffic, Shunra’s Virtual Enterprise is capable of predicting future application behavior with surprising accuracy. The production environment “dynamic snapshot” enmeshes the routers, gateways, endpoints, network protocols, and numerous other objects and their behavior parameters.

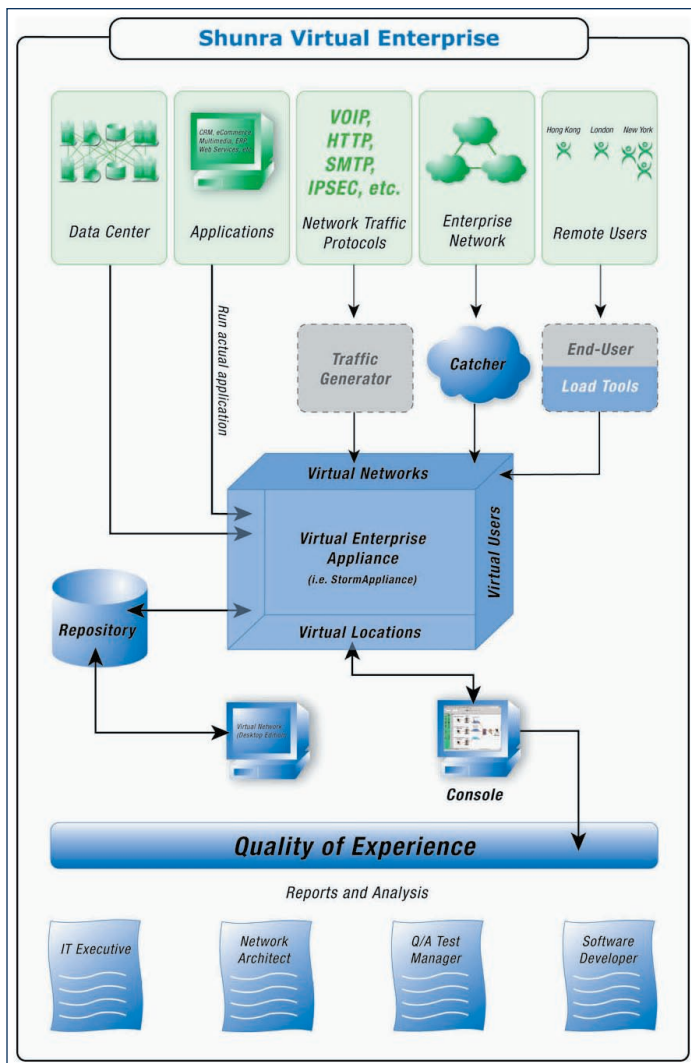


Figure 1: Virtual Enterprise Architecture

The Shunra Virtual Enterprise consists of the following:

- Virtual Enterprise Appliance – runs a “dynamic snapshot” of the production environment including remote offices and the network that connects them. With the Virtual Enterprise, organizations of various sizes can much more efficiently develop and deploy new high QoE applications in a collaborative manner and attain cost savings.
- Catcher – is used to capture live network data conditions and contribute to the “dynamic snapshot” over time
- Application Traffic Generator – integration with 3rd party tools, can inject protocol specific traffic on demand, or substitute for the actual application if live applications are not yet available.

- End User Automation – is used to record user scripts and run actual application transactions, including automating the tests, by location and user scenario. Third-party purchased products, or home-grown solutions, can be integrated as well.
- Virtual Desktop – is a solution for software developers that enables them to experience application behavior in production environment, while in the code development process, directly from their workstation. This empowers the programmer to develop optimally performing distributed applications with less subsequent recoding and fewer “bugs” coming from the QA testing or integration processes.

Deployed together, the Shunra Virtual Enterprise components expedite the development and deployment of new applications and reduce the cost and risk inherent in the development process from the application development, infrastructure planning and implementation, and network planning and deployment perspectives.

The current product emphasizes analysis and reports for specific users. Shunra’s Virtual Enterprise encompasses advanced QoE analysis and supports a variety of reports for both the technical and management users. These users can experience the actual QoE. Shunra is also investing in capacity planning and traffic analysis capabilities in VE.

Shunra’s Virtual Enterprise in Context with IT Evolution

The fact that IT must evolve beyond its traditional role as just a purveyor of technology should be evident from the factors already characterized as market pressures. Driven by choice and convenience, the external consumer expects a high QoE from goods and services providers. Internal business consumers are similarly driven to demand high QoE as they are themselves under time and quality pressure to perform. A globally competitive enterprise has no choice but to deliver this appropriate QoE to consumers of all varieties across the entire supply chain of participants. At the same time, applications executing in widely geographically distributed network environments are especially vulnerable to a wide-range of factors interfering with proper service as perceived by the user.

Add to these pressures, the need for IT to demonstrate accountability and prove value, while maintaining often reduced resource levels – and you have a textbook case for the need to change traditional ways of working and thinking. Shunra’s focus on providing a collaborative solution that can address the

lifecycle of a networked application service has the following clear advantages in helping IT to evolve:

- Improved operational and organizational efficiencies
- Improved processes as application development, Q A, architecture/planning and network operations learn to work more collaboratively
- Improved service quality as service levels can be verified and validated before production-level deployments
- Facile deployment at reasonable costs – so that IT organizations can quickly realize progress with limited investments and expand once value is seen.

EMA Perspective

Driven largely by convenience, the internal or external consumer expects a high QoE from goods and services providers. A globally competitive enterprise has no choice but to deliver appropriate levels of QoE to all consumers in the supply chain of participants, and to do so in a cost effective manner. At the same time the process of developing and deploying mission-critical applications required to achieve market competitiveness has evolved to accommodate much accelerated timeframes across broadly expanding geographies. To minimize or even eliminate many of the factors that arise when added complexity is met with shortened time to deliver – a new more collaborative approach to application life cycle development, deployment and network and infrastructure readiness and deployment has become imperative.

Shunra’s Virtual Enterprise empowers IT application, infrastructure and networking groups to collaborate in achieving effective QoE performance with unique levels of accuracy, at a flexible price point. Moreover Shunra’s solution, because of the simplicity of its design can be deployed with minimal administrative overhead in comparison with many of the alternatives, most of which require fairly extensive IT resources and significant services and support.

A key benefit of Shunra’s Virtual Enterprise is the ability to use this “dynamic snapshot” to virtually reproduce the network production environment from actual conditions and traffic, and then demonstrate application performance over any given condition without endangering the actual network. As a result, a wide range of potential issues in complex environments can be measured, analyzed and efficiently corrected prior to the introduction of an application, infrastructure or network service. This allows network staff, data center personnel, application developers, QA, project managers, and business owners to work together to plan and set meaningful performance metrics. These

metrics can become the cornerstones of service level objects and SLAs as new services are introduced.

Such a native combination of cross-silo collaboration in support of life cycle networked application development and deployment – with a firm and consistent eye on QoE at all phases – is at the heart of Shunra’s secret sauce. EMA believes that this focus, while not an end-all and be-all solution for service support and service delivery, is well-targeted and real-world. EMA expects to see Shunra perform well and grow in the coming years, to become a significant and potentially leading player in the area of application/network infrastructure optimization in support of service level readiness.

About Shunra

Shunra is a global provider of distributed network and application performance management solutions, assuring the customer experience while reducing business risk. Used throughout the application and project life-cycle, Shunra solutions provide a live end-user experience when running networked applications over a virtual replica of the production environment. Shunra's products support collaboration across the IT organization to deliver optimal application, network and infrastructure services. Over 1400 leading enterprises, technology vendors and service providers, including many of the world's largest organizations, achieve higher quality and shorter time-to-benefit with Shunra's innovative technology solutions.

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