

Technology Infrastructure

Butler Group Subscription Services

Application Development

TECHNOLOGY AUDIT

Shunra

Virtual Enterprise Solution Version 3.5

Abstract *Shunra Virtual Enterprise Solution (VE) is an application and network modelling tool for IT Performance Management, based on empirical traffic data. The network infrastructure is sampled over a maximum of 30 days and stored in VE. It is then possible to also simulate projected, future topologies. Real applications then plug into the virtual enterprise and can be modelled and tested in a number of ways, including pre-deployment rollout testing and planning, playing 'what-if' scenarios, capacity planning, security testing, etc. One of the chief virtues of the Shunra approach is that by basing VE on empirical network data and actual applications, minimum assumptions are made about the network infrastructure components and applications, such as in purely analytical models. VE is designed for the performance management of mission critical applications and infrastructure, in large or global organisations. The VE Console runs on Microsoft Visio and requires a Windows platform, but client applications can run on any OS.*

KEY FINDINGS	
✓ Simulation modelling uses captured empirical network traffic data.	✓ VE lets actual applications or the network to be interfaced with its virtual environment.
✓ Easy drag-and-drop model build tool.	i The VE Console requires Microsoft Visio.
✓ Agent-less data capture technology.	✗ Lacks higher-level business executive reporting.

Key: ✓ Product Strength ✗ Product Weakness i Point of Information

LOOK AHEAD
 Shunra has a number of enhancements and new projects in the pipeline (much under NDA), including expanded automation and reporting functions, which will address the current gap in higher level executive reporting. Butler Group is impressed with the future programme, and also expects Shunra to grow in tandem with the growth in the ITPM market.

► FUNCTIONALITY

Product Analysis IT Performance Management (ITPM) is a growth field as enterprises find that the burden of keeping software applications, network infrastructure, and IT services running smoothly requires assistance through automation. Thus ITPM is used to monitor Service Level Agreements, helps to reduce costs in IT departments with staffing pressures and skills shortages, and helps cope with the rise in complexity of distributed Web-enabled applications, ensuring optimum performance and troubleshooting problems.

There is one particular area of ITPM where simulation modelling plays a vital part: in managing the enterprise production IT environment. This is where it is necessary to plan ahead for capacity requirements and application deployment, run 'what-if' scenarios against network and application deployment options, test against security criteria, and troubleshoot distributed applications by examining the behaviour of the application realistically in a replay simulation. Simulation modelling is used primarily for mission-critical applications and Wide Area Network (WAN) issues, where the cost of applying modelling is offset by immediate benefit to the business.

Shunra's Virtual Enterprise Solution (VE) is an advanced simulation modelling environment for ITPM, providing decision support in pre-deployment planning, testing, and assurance, and also diagnostic support in post-deployment problem resolution. VE works by exposing the remote location performance of new or changed applications and infrastructure to real world network conditions from the production environment. Using the model-based management tools, it is possible to incorporate future "what-if" network changes, number of users at remote locations, or new delivery configurations. Managers and power users can proactively assess the potential impact on remote performance through *live* demonstration, as well as quantitative Quality of Experience (QoE) metrics and other diagnostic reports, for planning, cost-benefit analysis, user acceptance, troubleshooting, and so forth.

VE captures real network conditions, if available, and models the baseline network or future network topologies so that impact on application performance, particularly QoE, can be judged, analysed, and improved. Results can also be used for ROI calculations and to assess need and effectiveness of IT investment and purchase decisions. The key aspect to Shunra's approach is to integrate model-based management with real elements in order to emulate past, current, and future production environments for a complete "virtual enterprise".

Real applications running on enterprise servers are used to interact with the virtual environment giving quantitative results, and letting end-users or business owners experience the live application over the simulated network under various conditions. The applications running through the virtual environment can range from e-commerce, CRM, ERP, and business intelligence to VOIP and multi-media, as well as infrastructure projects such as storage networks, disaster recovery, data centre consolidations, and network service changes (e.g. Quality of Service (QoS), and Multiprotocol Label Switching (MPLS)).

Application traffic can also be simulated with third-party traffic generators and can be automated through tight integration with Shunra third-party load testing tools. If the application is still in development, programmers can perform unit tests while incorporating network effects into their test scenarios. The solution encourages collaboration throughout the application lifecycle by bridging actual application and infrastructure elements from production to pre-deployment phases through modelling and involving many IT roles. Hence, the solution provides useful analysis and clarity for application development, network planning, Quality Assurance (QA), and operations and business managers.

Product Operation

In modelling it is possible to use analytical/mathematical models, empirical techniques, or a hybrid of both. Shunra takes a mainly empirical approach, taking actual network traffic as a means of realistically modelling the environment, then taking the real application output and running it through the simulation virtual environment. Thus, in pre-deployment one can see how an application would behave on the production environment. The application and the VE Console are run through the Shunra Appliance and virtual engines, which make use of actual conditions captured from production or projected conditions of future topologies. The results are therefore highly correlated to actual post-deployment application performance.

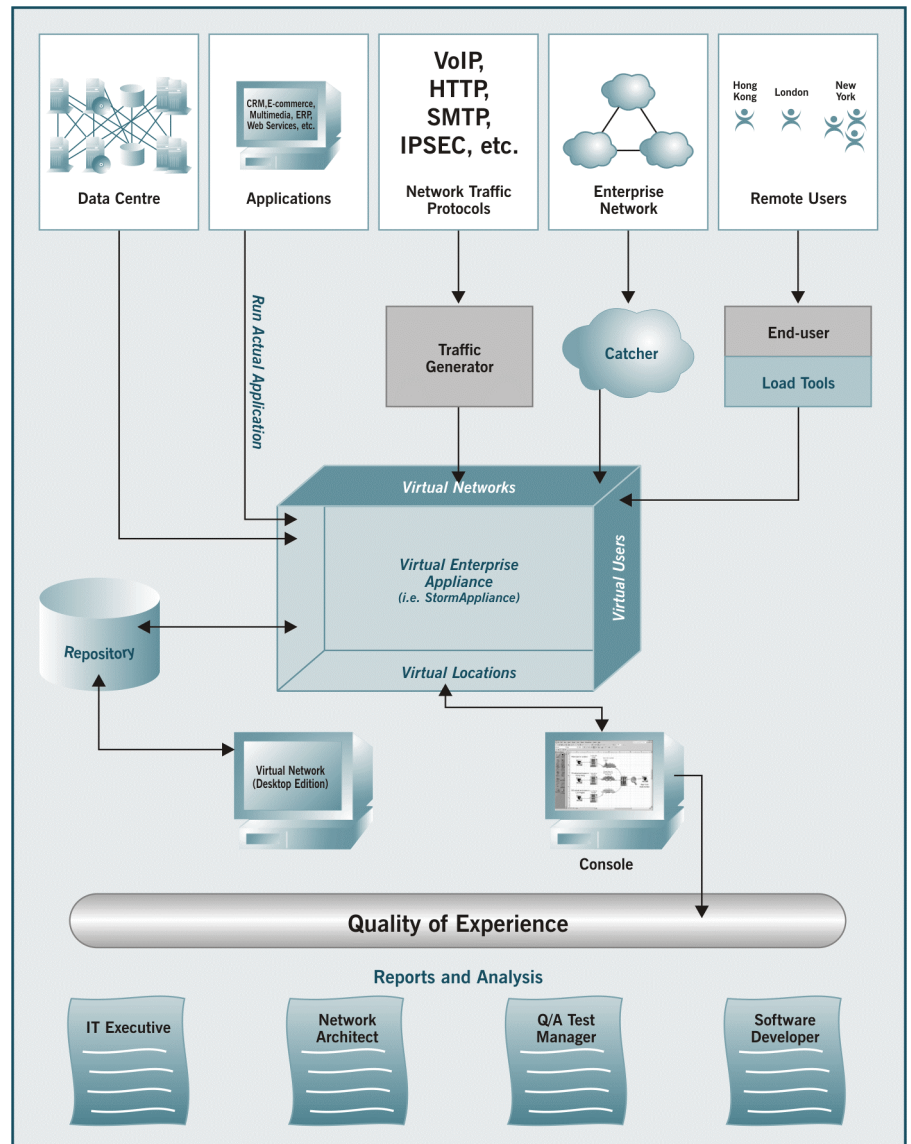


Figure 1: The Shunra Virtual Enterprise Solution Architecture

The architecture of VE is shown in Figure 1. At the heart of the solution is the VE Appliance (formerly known as Storm Appliance), this bridge or router device functions as a Transmission Control Protocol over Internet Protocol (TCP/IP) Layer 2-3 network appliance. The Appliance alters the speed at which traffic traverses the LAN and subjects data packets to the same impairments experienced on the WAN, such as latency, jitter, and packet loss or packet effects such as duplication, fragmentation, or bit error rate.

The VE Console controls the entire solution through its XML/HTTP interface, and is implemented as a Graphical User Interface (GUI) in a Microsoft Visio worksheet.

This makes using the Console a simple point-and-click process, making it quick and easy to define the virtual enterprise by dragging and dropping components, such as clouds (networks), endpoints, gateways, and end-users, then permitting the play and edit of sessions. Real-time statistics, diagnostic reports, and graphs are obtained from the Console as outputs. Also, from a client PC, the user can experience the actual running of the application (display and input/output) by running it through the virtual infrastructure scenario provided by the Appliance, emulation engine, and Microsoft Visio diagram. The Console itself can also act as a client in the virtual environment, enabling tests to be conducted directly.

The integration of VE with load testing tools is possible, allowing end-user activity to be recreated; compatible end-user load tools include Mercury's LoadRunner and Segue's SilkPerformer. VE can also model virtual Web end-users. Additionally, VE can control any third-party application that enables automation, such as remote PCs running batch scripts, FTP clients, custom testing tools, and traffic generators such as Ixia's Chariot.

An important input for accuracy of predictions for many testing scenarios is the real-time production traffic. The Shunra solution provides this through the "Catcher" module: with agent-less technology using Internet Control Message Protocol (also known as Ping), the Catcher captures a variety of traffic types and conditions such as latency and jitter over a maximum 30-day production period. These conditions can be played back, even for specific time fragments, when testing an application or network topology. Thus selecting time segments such as early morning e-mail rush-hour periods, or call-centre peaks, allow modelling during extreme conditions.

VE can contain Virtual Enterprise Desktop Editions for application developers. This allows programmers during unit testing or in technical support to activate the solution from an individual desktop and determine network effects on modules or full programs. By replicating the network production environment (e.g. from the Catcher data), programmers can isolate executables or processing issues that affect overall application delivery performance.

The solution scales to accommodate up to 16 ports for 10/100 Ethernet throughputs, or up to a maximum 8 ports of one Gigabyte Ethernet connections in a single chassis: the number of ports helps support configurations for testing, such as meshed networks. The number of application servers supported is essentially unlimited. The solution can capture network conditions for 30 days, 24X7. A single appliance unit can accommodate a hundred remote offices (endpoints) simultaneously if needed, and multi-tier architectures.

Additional Appliances may be added to accommodate simultaneous network topologies for different projects running at the same time. Complex network configurations such as differentiated services, QoS, MPLS, and frame relay enable the evaluation of different prioritisation schemes and larger, more complex type networks. Emulation capabilities include traffic types such as IP v4 and v6 address space, and multicast. The model can emulate symmetric and asymmetric bandwidth from 2.4 KBPS to 622,080 KBPS.

Product Emphasis

Using VE allows the IT decision-making process to start at an earlier stage, with cost savings to the business when deploying new services and applications. It is also possible to deal with problems early, resolve future issues, yielding benefits for the users in shorter, more cost-effective and more functional rollouts of infrastructure and applications.

There are benefits throughout the lifecycle, for example: developers can unit test applications against network conditions; testers can run staging labs or pre-deployment test environments, helping to bridge development and operations issues through empirical-based projections, diagnostics, and end-user input; and customer service/technical support can develop or re-use existing models to assist customers with post-deployment troubleshooting. Thus, insights gained in using VE are useful for decision-support or problem resolution in both pre- and post-deployment stages of applications, services, and infrastructure.

► DEPLOYMENT

In order to implement VE a technical understanding of networking and experience in a testing or QA environment is necessary, as well as basic skills in using Microsoft Visio. Typical installations take a few hours to implement by a trained user, and very complex networks may take up to a day at most to initially install with a useful topology. Shunra VE can be operated by two or three networking professionals, or tens of Quality Assurance engineers, and/or hundreds of software developers.

VE has various add-on modules to support larger test volumes of users, more locations of remote sites, or capturing more network paths, so the solution can expand to replicate the actual size and operation of the enterprise. The solution is also packaged so that upgrades that include added features can accommodate less typical types of traffic protocols, for example, video broadcast or traffic management.

VE Consoles must be run on a Microsoft Windows machine, and for software developers, the desktop edition must also run on Microsoft Windows-based systems. The VE Appliance is self-contained, running a variant of Linux, and can integrate with any application, infrastructure, third-party user load tools, or application simulator platforms.

The resources necessary to implement VE are as follows:

- A workstation to run the Virtual Enterprise Console, with each console requiring Microsoft Visio, running Microsoft Windows 2000 or XP Professional. A Java Virtual Machine is required to view live Cloud Shadow graphs on Windows XP Professional. A client PC is required to view the live application – this can also be the Console workstation.
- User Traffic. This can be from a live user or automated through various load generation and scripting tools, such as from Mercury (LoadRunner), Segue (Silk Performer), Shunra's own Web automation tools, or custom developed tools.
- Application Server with live application. The application can be the version to be tested, or the one under development. If no application server is available to the staging environment, simulated application traffic generation can be created via traffic generators such as IXChariot, which integrates with Shunra's solution.
- Infrastructure element being tested (e.g. storage area network). If a change to the infrastructure is being tested, the actual infrastructure component is used.
- If actual network conditions are recorded as recommended with Shunra's Capture product, then the Catcher software must have access to Ping the production network and be able to use its ICMP protocols through production firewalls. No further software (such as agents) is required, as the Capture product is agent-less.

Shunra can offer on-site training lasting half a day as part of the basic package. One and two day sessions are available for users requiring hands-on-training or more advance skills and knowledge to create and manage more complex network topologies and specific testing scenarios.

Technical support is provided 8am-6pm USA EST, and 8am-6pm local time in the Rest Of World by phone or e-mail. Field support is also available. There is a three-tier support structure, with all support provided directly by expert Shunra employees (except first-tier and second tier support by non-US resellers).

Organisations typically use an existing staging or test lab environment in order to facilitate the process of implementing Shunra VE, and to maximize the use of the outputs. The virtual environment is an area designed for pre-deployment tasks, to foster collaboration between those in development and operations in order to examine the impact from the network environment (current, new, or changed) on applications and infrastructure (current, new, or changed). The new process encourages network managers, planners, architects, and QA and systems engineers to participate in the process of testing the application or infrastructure and the network together, and view the system holistically to discover comprehensive solutions.

The standard offering comprises a VE Appliance configured for various throughput and interfaces, network condition capture technology, model components for remote offices, and integration support for load-testing tools or automation. The quantity and type of each of these elements is customised for the required solution.

► PRODUCT STRATEGY

VE is associated with deployment processes within companies across all industries. Typically large or global enterprises, or national government organisations have the mission-critical applications over a large distributed infrastructure and are likely to need a virtual environment for testing. Organisations with the IT maturity to proactively examine application and network changes prior to deployment in a structured manner are the strongest advocates for using a model-based solution, for example as found in the finance sector, distribution/transportation, aerospace, and manufacturing. Shunra has also found customers amongst leaders in fields such as retail, energy, and business services who follow other IT early-adopting segments like finance.

A secondary market for Shunra is networking hardware vendors and Independent Software Vendors: these technology-based organisations need to provide customers with assurance of their product's functionality or network utilisation parameters, or troubleshoot customer implementations of their products. Shunra has also begun making efforts to reach new customers through Value Added Resellers over the past year, and is applying new resources to EMEA in 2005, as well as increasing Asia and India support. In addition, large consulting companies and outsourced development and application management companies, often with strict Service Level Agreements, are incorporating VE as part of their methodologies.

Return On Investment (ROI) can be estimated in a number of ways. One method is to estimate the costs saved by using VE, preventing failure in deployment or in missing delivery expectations. Also VE can avoid gradual deployments, which are used due to uncertainties over deployment. Thus cost savings are made due to faster rollouts. The second way to measure ROI is to calculate the return on right-sizing or network efficiency. When existing bandwidth is not properly used, or too much bandwidth is purchased, or other network equipment is badly configured or misallocated, the costs can escalate significantly.

A third way is by avoiding unnecessary IT investments. For example, customers can validate that specific solutions, such as Citrix, WAN optimisation technologies, or code changes will improve the performance, before making costly investments. A fourth way to measure ROI is on the human resources side: lower productivity from inaccessible or poorly accessible application delivery systems can be avoided when actions to illuminate issues prior to deployment can be discovered.

The fifth way to measure ROI is to determine the effect on sales or markets. For instance, from a technology vendor perspective or any enterprise supplying automated information and processes directly to customers, VE positively affects sales and service of products through testing in advance in virtual customer environments. The result is greater customer confidence, closer relationships, more sales, and less need for post-customer support. Finally, VE reports can play an integral part in determining ROI for *other* projects – from data centre or server consolidations projects to network upgrades and expansions.

In the US, the product is sold directly by the Shunra sales force. However, a few US-based systems integrators have recommended the solution as part of their packaged solution of equipment and services offered to clients. In EMEA and other global markets, systems integrators and VARs resell the product.

The key business partnerships that support the product are: IBM Global Services, Accenture, Cap-Gemini, and Microsoft. And OEM partner Mercury. Distributor arrangements include: SysTeam in Germany, and Pass-consulting Group also in Germany are among a growing group of worldwide partners from Spain to India to Japan. The key technology partnerships that support the product include: Segue and Mercury.

Shunra offers solution packages that include hardware and software; along with integration tools and network condition capture capabilities, starting at 50,000 Euros in Europe on a perpetual license basis. Currently an annual Maintenance and Enhancement Subscription (MES) retails for 20% of the list price. Variations exist depending on required equipment interfaces to the Shunra platform and throughput capacity, number of virtual users, number of locations to capture network traffic, number of remote offices, and number of optional desktop access points.

Shunra and its partners also offer professional services from 'jump-start' one day on-site training, to more advanced training over several days. Shunra professional services staff also assists customers with setting up staging labs or assisting with test automation, as well as designing Shunra models and tests or providing programming or integration support for custom or commercial load tools.

Premier support options are available at an extra cost, and include 24X7X365 customer support, 4-hour phone response, 8-hour escalation, and an engineer available on site in 72 hours. Customers with MES receive first tier support directly by phone, Web site or e-mail from Shunra, except internationally when resellers provide first tier support. Second and third tier support are invoked upon escalation within 48 hours or less.

► COMPANY PROFILE

Shunra Software is a privately held company based in Kfar Saba, Israel, with worldwide marketing and American headquarters based in New York, USA, and offices in UK, India, and Singapore. The company was established in 1997 and has been profitable since inception. In August 2004 the company raised US\$11.5M in venture capital funding, from Insight Venture Partners and Carmel Ventures, for the purpose of accelerating the company's expansion, including product development, international distribution, sales, and marketing.

Shunra's success has been repeatedly recognised by Deloitte & Touche who have included Shunra Software on the European Technology Fast 500 list for four years in a row. The company currently has over 75 employees, with plans to grow. Some of Shunra's key clients include: 3M, Boeing, Dow Chemical, Cisco, EMC, FedEx, Fidelity, General Electric, JPMorgan Chase, Hotwire.com, Kelly Services, Merck, Merrill Lynch, Nestle, Pitney Bowes, Sony, Target, and Vodafone. The company's total customer base runs to 1,400.

► SUMMARY

The increasing complexity of today's network infrastructures and applications are matched by management demands for increased reliability, availability, and optimal performance: the need for ITPM tools is therefore growing. Whether it is large corporate users, offshore companies, or ISVs, all face demands for higher quality in services and deliverables, heightened by increasing competitive business pressures. Shunra's Virtual Enterprise Solution helps face these challenges.

Furthermore, VE can help application lifecycle management, enabling improved collaboration between developers, testers, production operators, and customer service. VE can be used during all the lifecycle phases: Unit and integration testing; Function, load, and benchmark testing; Readiness and acceptance testing; Network baselining and capacity planning; Service level assurance; and Post-deployment troubleshooting.

Infrastructure and application issues are easier to resolve through the facility to replay, troubleshoot, and plan ahead in the virtual environment. Butler Group believes using VE can reduce risk in running large and/or complex IT departments, especially where mission critical applications are involved.

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