



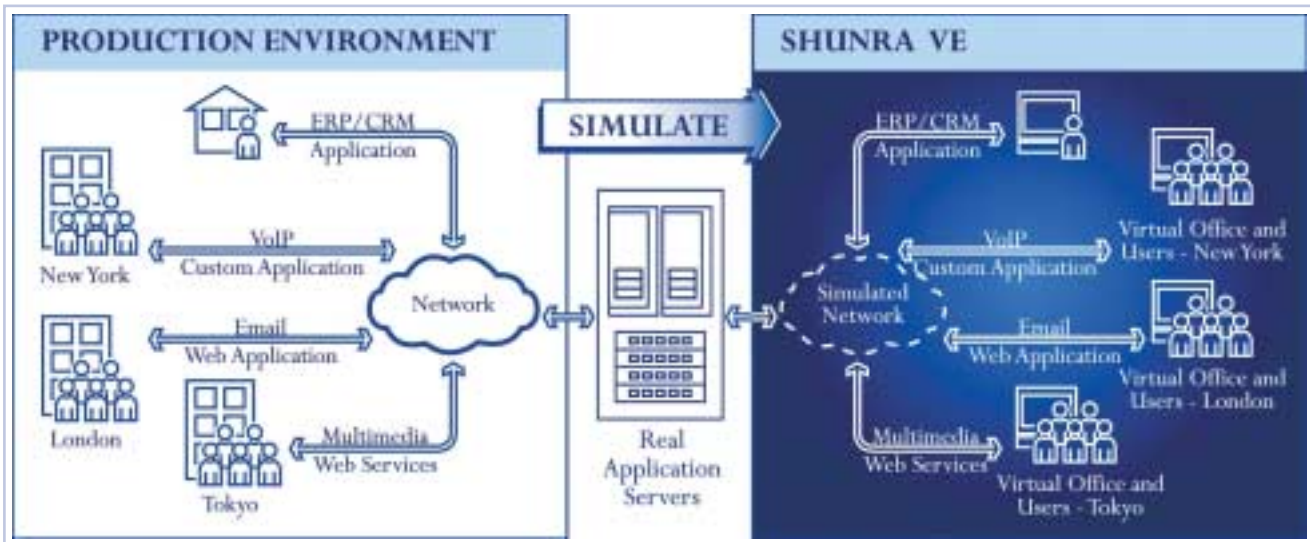
# SHUNRA VIRTUAL ENTERPRISE 4.0

## DELIVER IT WITH CONFIDENCE

- Can you accurately predict how new or updated applications will perform for remote end-users?
- Will the end-user experience be adversely affected by a server consolidation or data center move?
- Can you recreate production network conditions in your lab?

### □ RECREATE ANY PRODUCTION NETWORK ENVIRONMENT

Shunra Virtual Enterprise (Shunra VE) creates an exact model of your production environment – including the network, remote locations, and the number and distribution of local and remote end-users. With Shunra VE, you can test the performance, scalability and robustness of applications and network infrastructure under current and projected real-world conditions – before rolling them out into production.



Shunra recreates a virtual model of the real-world production environment.

### SHUNRA VE EMPOWERS YOU TO:

- Eliminate risk and guesswork by knowing exactly how applications and infrastructure will perform in a distributed environment - before rollout
- Deliver faster, smoother application roll-outs, without lengthy field trials or an inefficient “fix-as-you-go” approach
- Support “go”/ “no-go” decisions
- Set service level expectations – before deployment
- Avoid over spending on network infrastructure “improvements” that don’t actually help
- Minimize the cost and effort needed to troubleshoot post deployment problems



**MAKE INFORMED “GO” OR “NO-GO” ROLLOUT DECISIONS**

Shunra VE supports change management practices by telling you how your next application version, new infrastructure, or third-party vendor’s product will work in any production environment. Its detailed reports clearly show you the impact of production conditions on business processes and whether performance falls inside or outside of acceptable levels.

Shunra VE also highlights all non-compliant transactions and conditions – allowing you to quickly make informed “go” or “no-go” decisions. These unique predictive capabilities eliminate uncertainty and risk, while providing early insight into potential problems.



Shunra VE supports go/no-go decisions by grading application service level compliance at each location.

**"Before using Shunra VE we had to make educated guesses. With Shunra VE we know in advance that our application changes are ready for customers and can move them into production more quickly. Shunra VE saves us time, effort and resources, and helps us avoid unnecessary risks, re-coding and re-testing."**

Hotwire.com

**EASILY ASSESS AND VALIDATE ALTERNATIVE SOLUTIONS**

When it’s a “no-go” Shunra VE makes it easy to assess alternative solutions or technologies, validate changes, and make knowledgeable decisions based on real-world performance. By using Shunra VE to discover and analyze network-related application issues in advance, you can determine exactly what modifications to the application and/or your infrastructure are needed. This in-the-lab approach eliminates the need for lengthy field trials and costly fix-as-you-go rollouts.

**ENSURE SERVICE LEVEL COMPLIANCE BEFORE ROLLOUT**

With Shunra VE you can accurately predict the quality of the end-user experience at any remote location, and benchmark application performance under any combination of network conditions.

This enables you to quickly and easily assess service level compliance for new or changed applications – all before rolling them out onto the production network.

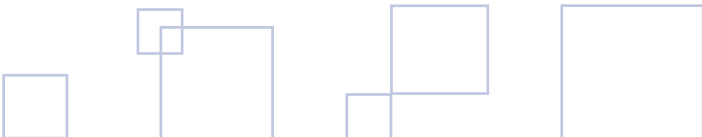
Through this proactive approach Shunra VE helps you meet deployment deadlines, avoid finger pointing and post-deployment firefighting, improve time-to-benefit, and ensure end-user satisfaction.

Location	Transaction	100th Percentile [ms]	Median [ms]	Maximum [ms]	Percentile [ms]
Dallas, TX	Admin	30	36.12	38.09	40.00
	Log On	7	4.31	1.00	6.70
	Open Document Search/Print	11.0	11.03	11.70	11.81
	Search Document	6.9	6.32	6.70	6.87
Dallas, TX	Admin	30	36.36	31.32	39.89
	Log On	7	3.85	8.01	5.80
	Open Document Search/Print	11.0	11.40	14.00	13.29
	Search Document	6.9	6.17	6.00	6.61
Dallas, TX	Admin	30	36.07	36.81	36.21
	Log On	7	3.74	3.00	4.36
	Open Document Search/Print	11.0	11.07	11.00	11.00
	Search Document	6.9	6.17	6.00	6.69
Dallas, TX	Admin	30	36.00	36.00	36.00
	Log On	7	1.14	2.00	1.00
	Open Document Search/Print	11.0	11.71	11.00	11.17
	Search Document	6.9	6.01	6.00	6.61
Dallas, TX	Admin	30	36.36	36.89	36.70
	Log On	7	3.70	6.00	5.70
	Open Document Search/Print	11.0	11.01	11.00	11.00
	Search Document	6.9	6.18	6.00	6.61

Shunra VE analyzes application service levels at each simulated remote location.

**"Sub second transaction execution is absolutely critical in electronic foreign exchange trading, and Shunra VE helps us consistently assure optimal performance for our users even before we deploy the platform in production. Using Shunra VE during the development process to understand and optimize performance in such a demanding environment - before deployment - provides strategic value to our business. Without Shunra VE we would feel like we were flying blind."**

Hotspot FX





## ■ BEST PRACTICES APPROACH

### □ BRING PRODUCTION INTO THE PRE-DEPLOYMENT LIFE-CYCLE

Network experts, software architects, and QA/testing professionals use Shunra VE to factor the production environment into any phase of the pre-deployment lifecycle – from design through operations. Shunra VE is proven technology that is extremely flexible and easy to install, configure and use. It seamlessly integrates into your existing environment, tools and methodologies right out-of-the-box.



### □ TRY OUT “WHAT-IF” SCENARIOS TO VALIDATE ALTERNATIVE SOLUTIONS

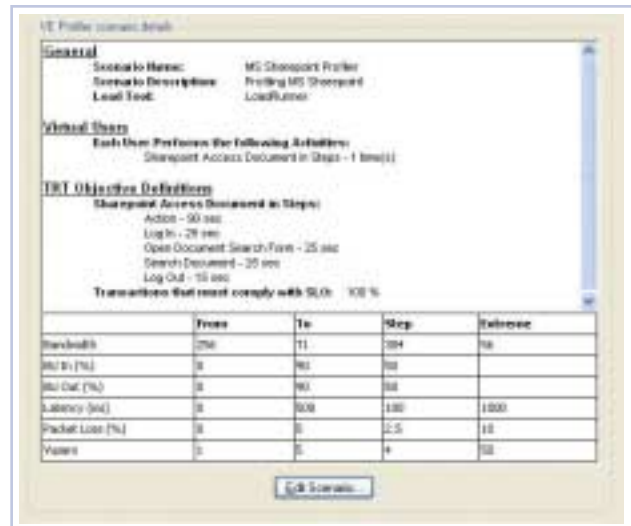
With every test scenario Shunra VE delivers comprehensive performance reports that enable you to pinpoint the root causes of problems.

Once problems are fixed you can quickly adjust your Shunra VE model to the new parameters and re-run your tests to verify that your changes really have resolved the problems. If they don't sufficiently improve performance, you can continue to assess alternative solutions using Shunra VE.

In fact, with Shunra VE you can iteratively try any number of “what-if” scenarios to identify optimal parameters and configurations for your applications and infrastructure.

### □ DELIVERS A POWERFUL, INTUITIVE AND ITERATIVE TESTING PROCESS

Shunra VE incorporates a powerful, highly-intuitive best practices approach to testing. With Shunra VE you first build your virtual enterprise model either manually or by capturing parameters directly from the production network. Shunra VE's wizards then help you create automated test scenarios in minutes. Once these scenarios are created, you simply connect Shunra VE to your real applications and/or existing infrastructure, and your virtual enterprise scenarios are ready to run. When a scenario is running any application or hardware connected to Shunra VE behaves as it would under production environment conditions, enabling you to accurately measure application performance and the remote end-user experience. These measurements are stored in a central repository for easy version comparison, change control and future reference by the project team.



Shunra VE provides wizards which help you automate your test procedures according to best practices.

**"We are using Shunra VE to test a complex Oracle-based global application for one of our customers. It's been extremely useful in helping us achieve our benchmarking goals, such as determine how best to configure the infrastructure, and understand performance expectations over high-latency network segments."**

Accenture

## ■ SHUNRA VE TECHNOLOGY

Shunra VE includes the following key components:

### □ PRODUCTION NETWORK CAPTURING AND RECORDING

**VE Network Catcher** captures and records production network parameters – including latency, jitter, and packet loss – directly from the production network for up to 50 sites and up to 30 days. These network parameters can then be replayed within the VE Network Appliance or VE Desktop.

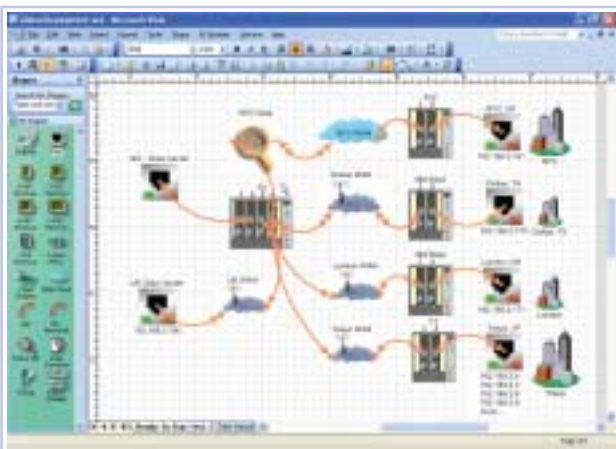
Using agent-less technology for fast deployment, VE Network Catcher can capture production network conditions anywhere across the enterprise – such as between the data center and remote locations. You can also use the VE Network Catcher “Lite” version to record conditions on links to which you don’t have direct access.

### □ NETWORK SIMULATION

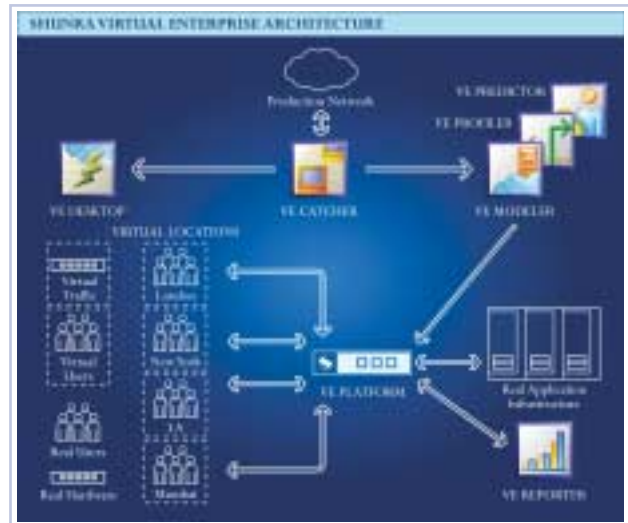
Based on shunra’s award-winning network simulation technology, VE Network Appliance and VE Desktop recreate the behavior of enterprise networks based on their specific attributes, such as topology, latency, jitter, bandwidth and packet loss.

The **VE Network Appliance** is a high-performance network appliance that functions as a bridge, switch or router. It alters the speed at which traffic traverses the Local Area Network (LAN) test-bed and exposes data packets to the same impairments to which they would be subjected on the Wide Area Network (WAN).

**VE Desktop** is a standalone “lite” software version of the VE Network Appliance that runs on Microsoft Windows. It provides basic network simulation to users who are mobile or who don’t have access to the VE Network Appliance.



VE Modeler lets you quickly and easily define test scenarios using a simple, highly intuitive point-and-click GUI based on Microsoft Visio.



Shunra recreates a virtual model of the real-world production environment.



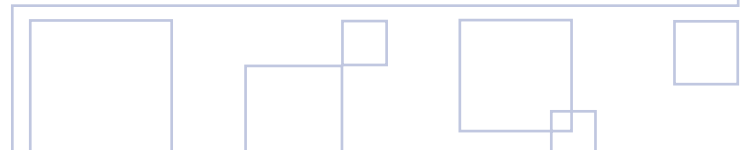
VE Network Appliance

### □ VE CONSOLES

**VE Modeler** lets you quickly and easily define and run test scenarios using a simple, highly intuitive point-and-click GUI based on Microsoft Visio®.

With VE Modeler, all Shunra VE parameters and scenarios can be controlled, edited and re-configured to create current, future or worst-case scenarios that can be replayed over and over.

Through the VE Modeler you can save all your test scenarios (including third-party tool configurations) and re-run them whenever you want.

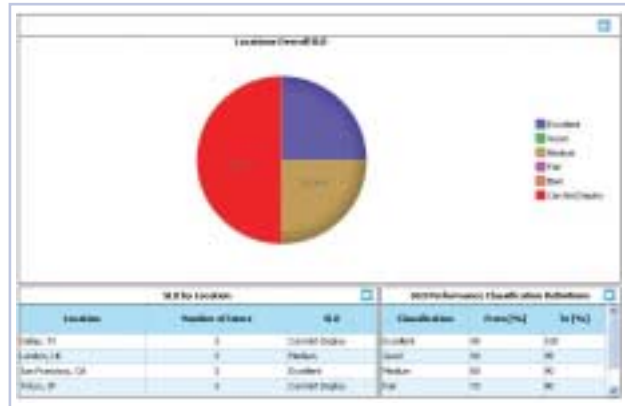


**VE Predictor** makes it easy for you to determine if new, modified or existing applications will meet service level objectives at all remote locations – before you deploy those applications in production. Leveraging real-world network conditions captured by VE Network Catcher, VE Predictor automatically runs business transactions over these recorded network conditions and measures performance against pre-defined service levels.

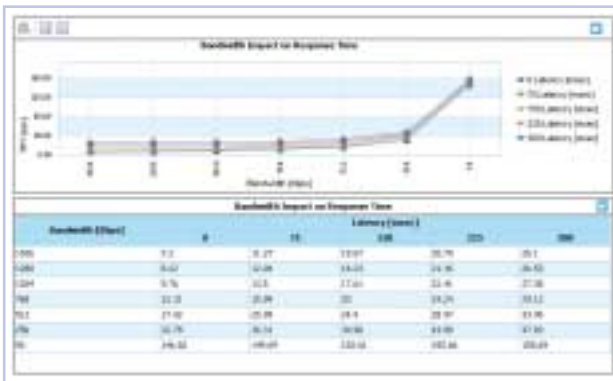
VE Predictor then provides detailed information on application performance, availability and consistency for each location based on the time-of-day, network topology and conditions, and end-user utilization and behavior.

**VE Profiler** delivers automated application stress-testing under any combination of network conditions. It generates network impairments such as latency, bandwidth, packet loss and utilization, and then runs your application against these conditions to determine if and when the application will meet SLOs.

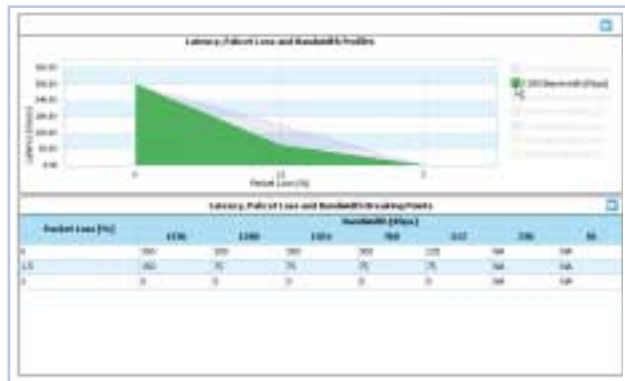
VE Profiler’s graphically intuitive “envelope” reports then illustrate the specific network conditions that are necessary for achieving SLOs, as well as the network and end-user load thresholds that the application can tolerate while still providing acceptable performance.



VE Predictor shows you if your new, modified or existing applications will meet service level objectives at all remote locations.



VE Profiler analyzes application performance under any combination of network conditions.



VE Profiler highlights the network conditions that are needed to deliver acceptable operating conditions.

## VE API

Shunra VE provides APIs that enable you to manage other third-party lab resources – including PCs running batch scripts, FTP clients, home-grown testing tools, and traffic generators– so you can use Shunra VE as your lab command center.

## SUPPORTS A WIDE RANGE OF APPLICATIONS & TECHNOLOGIES

Shunra VE can be used with any IP-based application – including ERP, CRM, SCM, e-commerce, VoIP, multimedia and email/collaboration software, well as web-based and thin-client applications. It can also be used to test performance over simulated networks including leased lines, frame relay, multicast networks, MPLS, VPNs and satellite links.

**"We've adopted network simulation as part of our standard mode of operation and use Shunra VE continuously throughout our testing process. Now, when our end-users say that the application is running slow, we can really see for ourselves, in the lab, what they are experiencing. This helps us find the real source of problems."**

Kelly Services



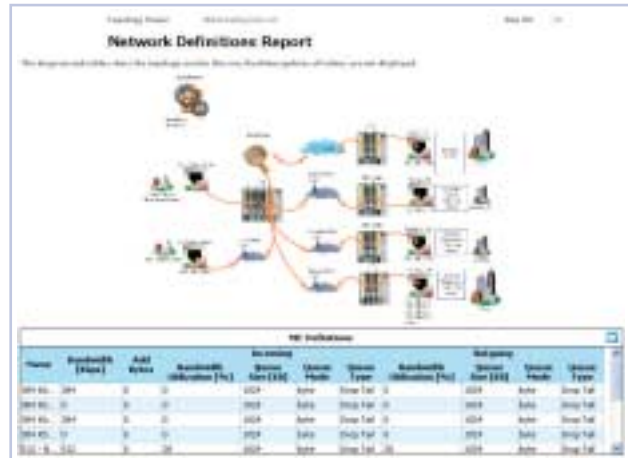
## □ DETAILED ANALYSIS & EXECUTIVE SUMMARY REPORTS

**VE Reporter** processes and stores your test results and produces intuitive reports and graphs in real time and offline for easy analysis. With VE Reporter, you can quickly correlate application performance with network statistics for full visibility into service level compliance issues, performance bottlenecks, and other potential problems. All reports can be exported into MS Office documents such as Word and Excel, and/or published in HTML.

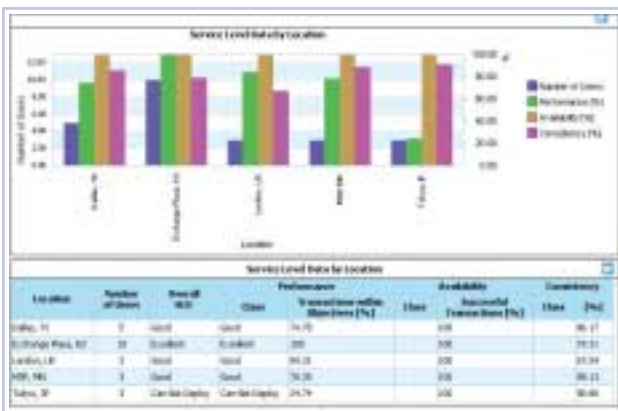
VE Reporter also provides executive summary reports which can be displayed on-screen or exported into Microsoft Word for easy review and distribution to management.



VE Reporter drills down into application performance data at each remote location.



VE Reporter automatically documents all test configurations for future reference and easy project management.



VE Reporter provides graphically intuitive reports and graphs on service level components such as performance, availability and consistency.

"Our technology is deployed in highly distributed environments, and users must get seamless access to data from anywhere in the world. Shunra VE does a great job of allowing us to show our customers exactly how our platform will perform in their production environments, before deployment. This is very powerful and helps us make a very good impression on our customers, and increases their comfort level with our technology. Shunra VE gives us a real competitive advantage."

Interwoven



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