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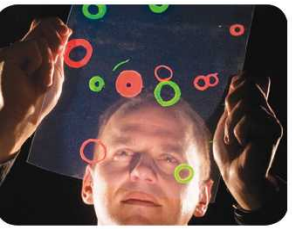

Performance Testing for Reduced Risk of System Overload

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Sandia National Laboratories

Exceptional service in the national interest

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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Agenda

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- Poll & Introduction
- Collecting Requirements
- Using HP LoadRunner
- Reporting
- Case Studies
- Funding, Building Trust
- Closing Discussion

Why are you here?

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- What's your background?
- What would you like to learn from this session?

Introduction

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- Performance testing includes both load and stress testing
- Great for analyzing behavior of systems with
  - ***many concurrent users***
  - ***many transaction executions***
- Helps
  - Identify slow transactions in business processes
  - Expose parts of application that are sensitive to load
  - Monitor server resource utilization while system is under load
  - Identify resource constraints
- Provides repeatable tests
  - Invaluable for troubleshooting

Setup for Performance Testing

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- Website
- Service Request to Email List
- Customer Worksheet
- Business Process Definition & Screen Shots

Customer Worksheet, part 1

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Load & Stress Test - Customer Worksheet

Item	Description	Application Information
Application Name	Common name for the application.	
Acronym	Acronym for the application, if any.	
Brief description of application	Give a one or two sentence description of the purpose of the application.	
Business processes to be load/stress tested	Identify the high frequency/high visibility business processes that are critical to the success of the application. These are the only processes that will be load/stress tested. Business processes typically involve several screens to complete.	
Rationale for load/stress testing	The usual rationale is that application developer wants to avoid any surprises when the application goes into production. Other reasons for load/stress testing include: testing of changes to infrastructure components, testing protection against denial of service attacks.	
Target date for completing load/stress testing	What is your schedule?	
Primary contact & phone number	Identify a technical contact the load/stress test team can contact for questions.	
Project/Task for tester's time charges	See APAT funding policy.	

Customer Worksheet, part 2

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Technical details of application to be tested

Environment to test system (development, quality, production)	Identify which environment will be used for load/stress testing.	
Names of servers supporting the application (web server, database server, file server, etc.)	Identify all of the web servers, database servers, application servers and other applications supporting this application. Do not include Kerberos or DNS servers.	
Specific parts of the network that should be tested (if any)	If there are concerns about load/stress testing the application from certain parts of the network, identify them here.	
Is Kerberos authentication required?	We need to know this so we can emulate different users logging on.	
Is application specific authentication required?	It may be necessary to set up additional test logins in the application so we can emulate different users logging on.	
Preferred browser (IE, Netscape) and browser version	Some applications behave differently depending on the browser and browser version. Identify which should be used for load/stress testing.	
Additional Plug-Ins	If additional Plug-Ins are required for the application, identify them here.	

Customer Worksheet, part 3

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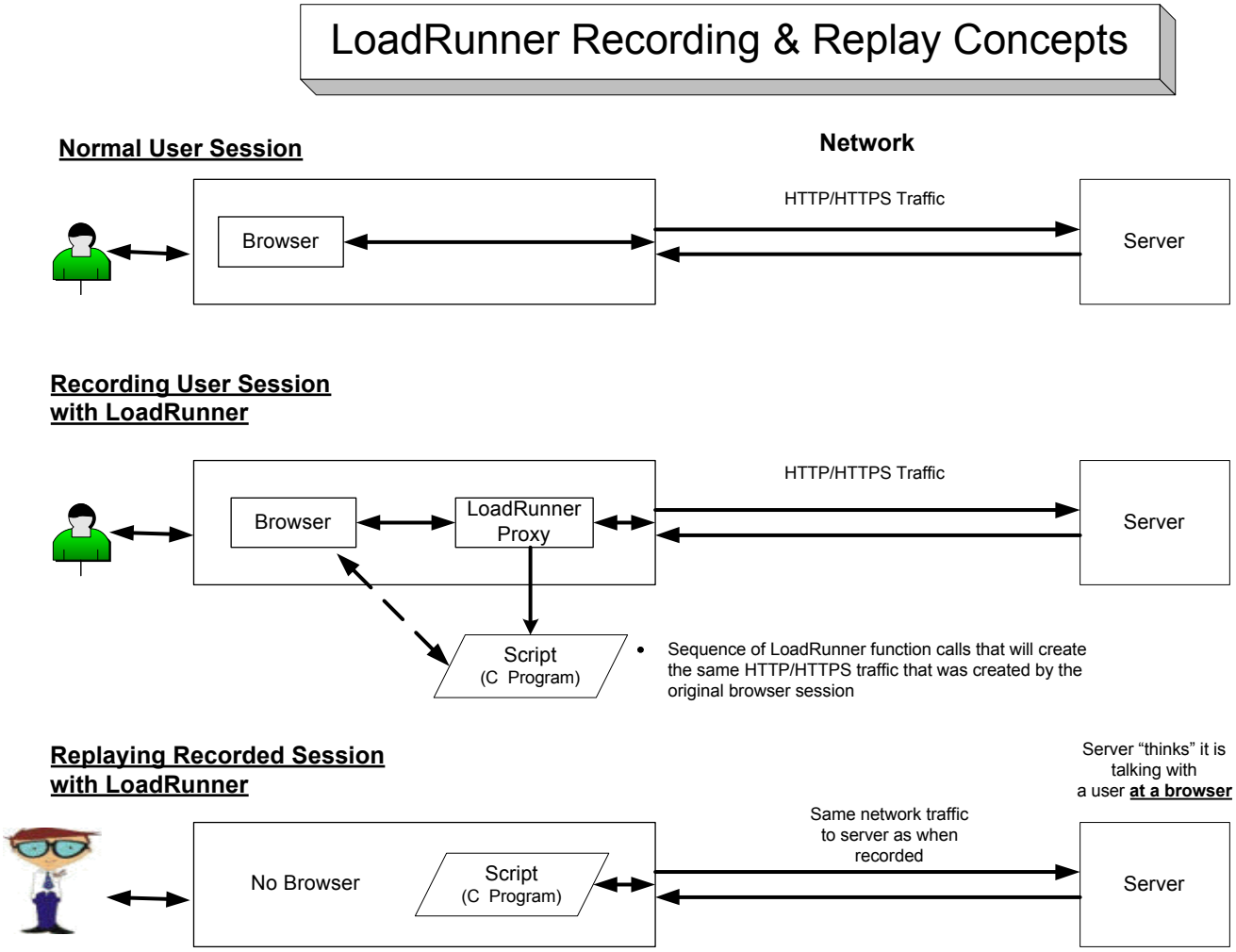
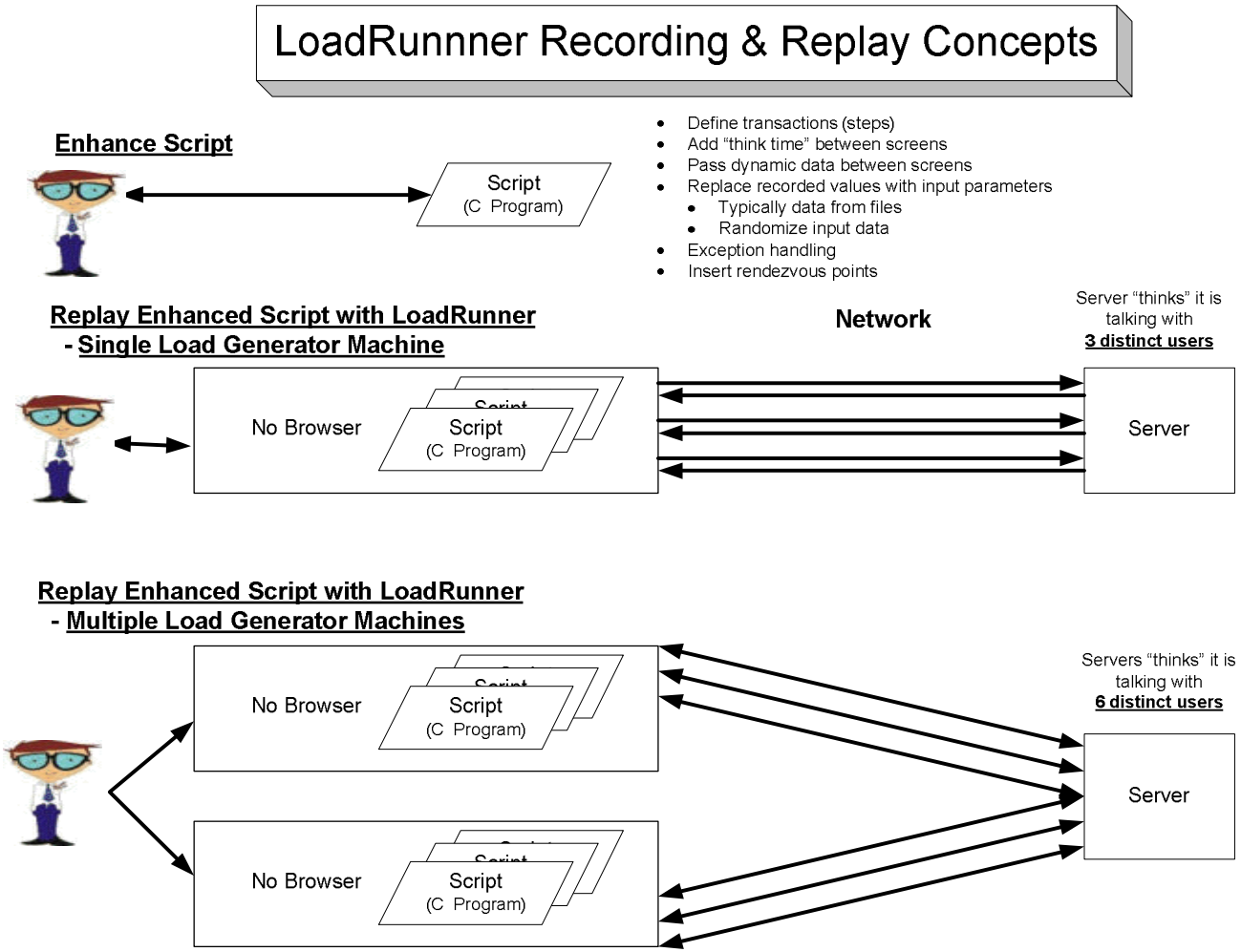
Business Process and Load Information

Starting URL or Web Service WSDL	Provide the starting URL to get to the application or web service WSDL	
"Screen shots" file showing navigation through the business process.	Make "screen shots" of your application as a typical user would make their way through business process to be tested. Use shift-PrintScreen to put this on your clipboard. Then paste the image into a separate Word or Wordpad document.	
Files of variable data to be used for input	Provide data files to be used for variable input on screens. Comma delimited.	
How many times per hour will the business process be executed?	State your "high watermark" for the number of times per hour that the business process will be executed on the system by all users.	
On average, how long does it take a user to execute the entire business process?	Measure or estimate how long it takes for a typical user to navigate through the business process described in the screen shots and record that here.	
Maximum allowable response time	State what your threshold is for acceptable response time.	

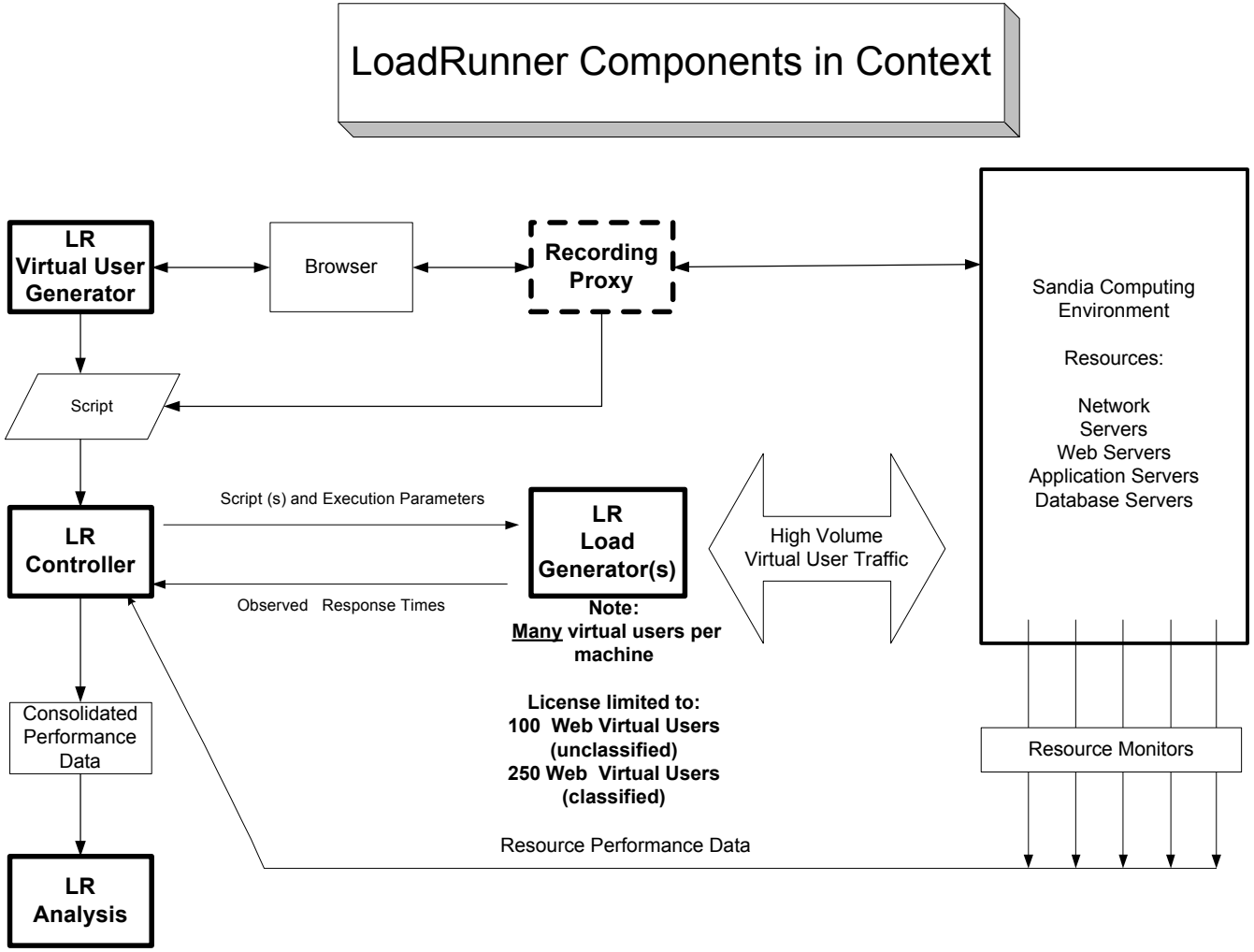
Using HP LoadRunner, part 1



Using HP LoadRunner, part 2



Using HP LoadRunner, part 3



Reporting

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- **Analysis report**: Word document based on template. Template defines standard sections and wording.
- **HTML report:** output from LoadRunner, configured by tester.

Sample Output: Response Time

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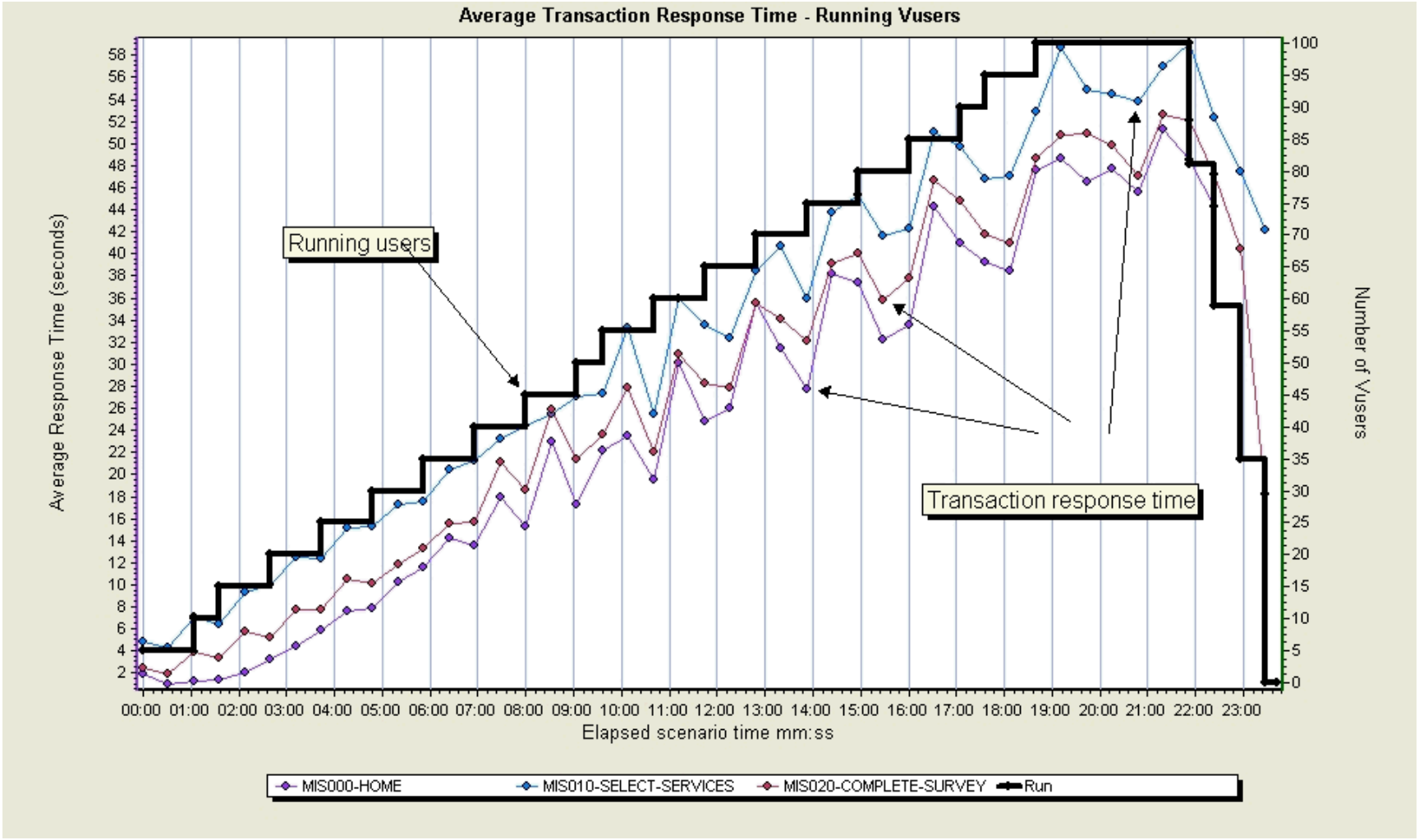

Sample Output: Server Resources

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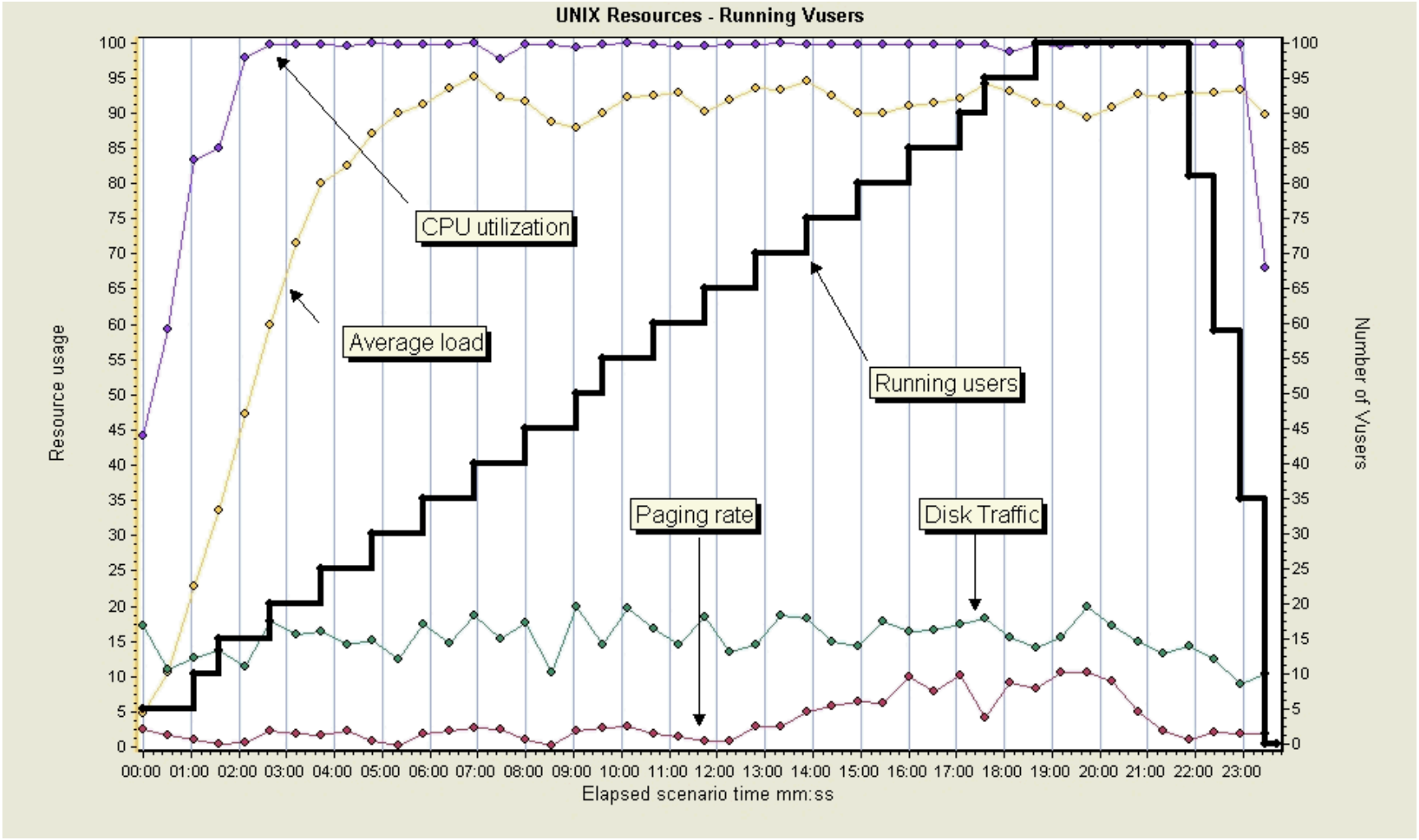

Case Studies

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- Search software with COTS tool added
  - Failed performance test.
  - Many errors, slow response times as load increased.
  - COTS tool tested separately: same issue.
  - Programmers added graceful exit for network timeout.

Funding, Building Trust

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- Funding
  - Center funds: software, training, process development, website.
  - Customer funds specific tests.
- Build trust
  - good communication
  - establishing reasonable expectations

Closing Discussion

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- **Your experience:** What experience have you had with performance testing? What lessons can you share?
- **Take aways:** What lessons can you apply from today's session?
- **Going forward:** Enjoy Seattle and the rest of the conference!