

Introduction



“Miners used a canary in a cage to detect toxic gases.

If the canary stopped singing, the miners fled the caves.

This was one of the early predictive monitoring systems.”



Overview

- SSMA consists of three parts:
 - A lightweight client for monitoring Solaris, Linux and Windows server environments
 - A server component for collating and reporting data gathered from the SSMA client
 - A load generation client
- Together these components make SSMA a powerful tool for providing data for effective:
 - Performance monitoring
 - Capacity planning
 - Trend analysis
 - Problem resolution

SSMA Clients



- SSMA has two client components:
 - SSMA Monitor
 - Gathers a plethora of system information on a frequent basis useful for *near time* monitoring and historical analysis
 - SSMA Load Test
 - Creates repeatable load
 - Allows for easy comparisons between differing systems
- Both tools have the same design
 - Tools do not need root to run or install
 - Runs on Linux, Solaris (both SPARC and x86) and Windows

SSMA Monitor



- How does it work?
 - On the machine being watched, we execute a shell script
 - *canary_solaris.sh, canary_linux.sh .etc*
 - These scripts issue 52 distinct commands producing a 900 line ASCII output file.
 - The output file is sent to a central server for reporting and graphing (transport is scp, ftp, sftp, mailx, nfs, http or https)
 - The script samples data every 30 seconds and every 10 minutes.
 - Uses less than 19 seconds of CPU time and 90 seconds of elapsed time per execution

OpenCanary Monitor Cont...



- **Shell Script:**
 - 1mb tar ball untarred into /var/tmp/canary on each client
 - Works on Solaris 6/7/8/9/10, TSOL 8, S10 Zones and Open Solaris (SPARC & x86) ,HP-UX, Windows XP and Linux.
- **Gathers a variety of information including:**
 - System load information (CPU, memory, I/O)
 - Network performance (Latency, bandwidth, packet loss)
 - Creates a configuration template showing the /etc/system, automount, and GNOME settings across all servers
- **NB: No binaries on client machines. The same script works across OS versions.**

SSMA Server



- The Server component acts as both a data repository and reporting server
- Data is stored as ASCII files, no databases
- Reporting is provided via an Apache web server
- The reporting currently available includes:
 - A dashboard of 20 key graphs
 - Summary of systems monitored
 - Drill down of individual components
 - Animated load graphs
 - Application heat maps

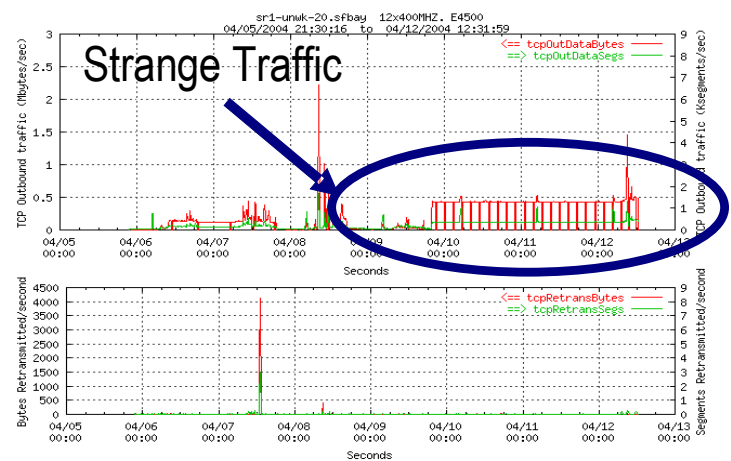
Simple System Monitoring Application



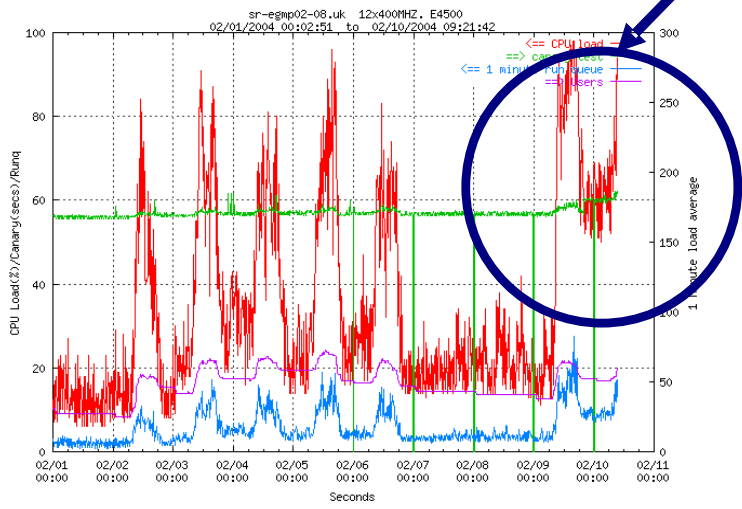
Dashboard

- The dashboard provides 20 graphs for each server
 - Created every 10 minutes
 - Show network traffic, CPU load, memory, disk activity and application profiles.

TCP Traffic



CPU Load



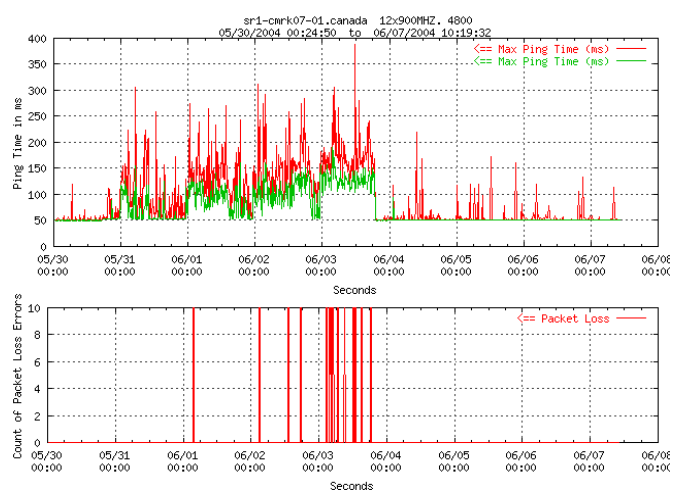
Runaway Process

Simple System Monitoring Application

Using the Dashboard

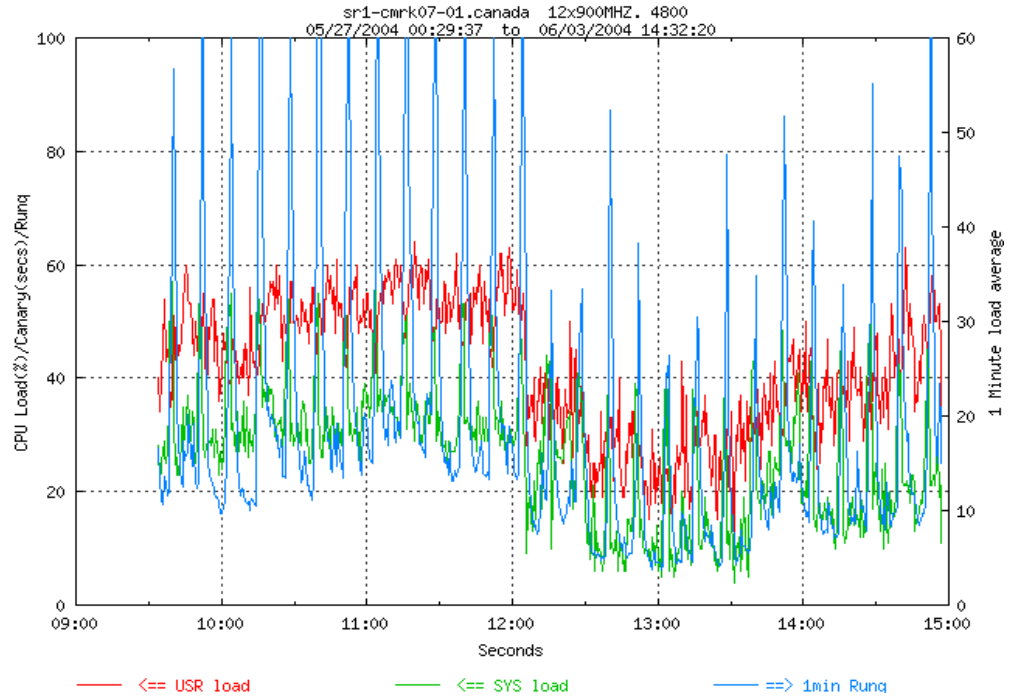


- Helpful for performing root cause analysis



Avg and Max ping time indicated a bad network for four days. Ping time tripled.

We sample %SYS, %USR, runq every 30 seconds: %SYS increased by 20% every 10 minutes. Runq increased by over 60 every 10 minutes. Suspect: automountd



Simple System Monitoring Application

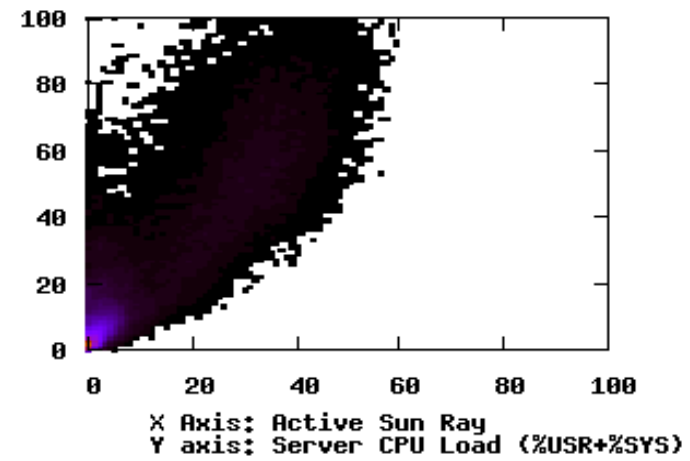
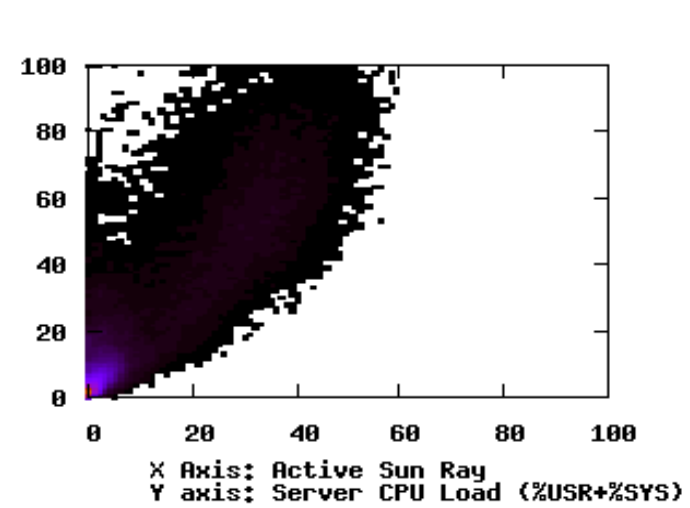


Reports: Summary

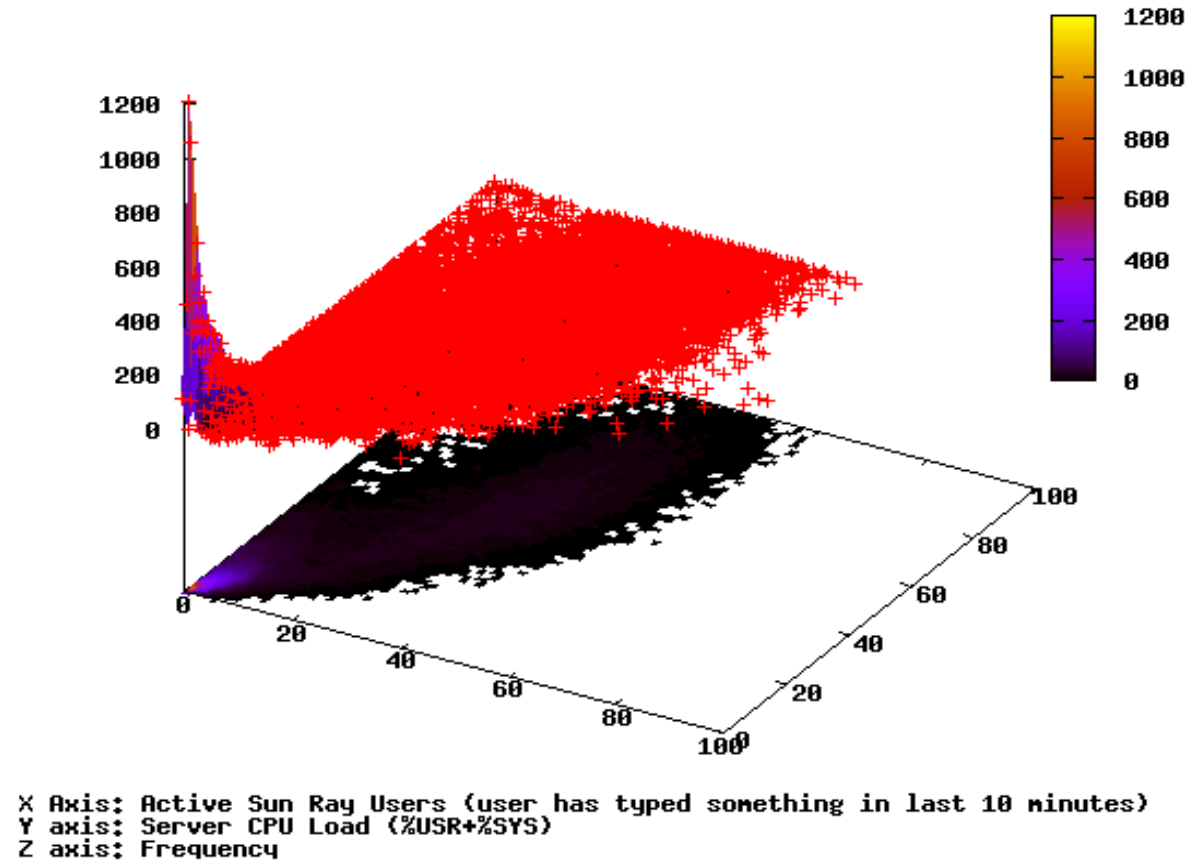
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<ul style="list-style-type: none"> ☰ Probe Age ☰ Server Drilldown ☒ CPU Load (Animated) ☰ Application Load Profiles ☰ Configuration ☰ User's CPU ☰ User Multi Logon ☒ Application Histograms ☒ PRSTAT Histograms ☰ CPU Profiles ☒ Graph Pid[s] ☰ DTU Terminal Stat ☰ Canary Heatmap ☰ EBC ☰ DTU Map ☰ Sun Ray Badge ☰ Find Sun Ray Badge Status ☐ Download <ul style="list-style-type: none"> ▼ v4_00 (Aug 5, 2005) <ul style="list-style-type: none"> • sparc [9.1 Mb] • linux [2.5 Mb] • vos [2.0 Mb] 	<p>← Select report!</p> <table border="1"> <thead> <tr> <th>Report/Group Name</th> <th>Report Type</th> <th>Has Child</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Probe Age</td> <td>☰</td> <td>No</td> <td>Each host's parsed file will be counted in a 15, 30, 45, 60 minute bucket.</td> </tr> <tr> <td>Server Drilldown</td> <td>☰</td> <td>No</td> <td>Every server we watch is listed here.</td> </tr> <tr> <td>CPU Load (Animated)</td> <td>☒</td> <td>No</td> <td>Description</td> </tr> <tr> <td>Application Load Profiles</td> <td>☰</td> <td>3</td> <td>CPU Load profile per server</td> </tr> <tr> <td>Configuration</td> <td>☰</td> <td>4</td> <td>Comparison of crypto settings, automount settings, gnome settings, and common usage.</td> </tr> <tr> <td>User's CPU</td> <td>☰</td> <td>No</td> <td>Regression graphs for cpu,active sun ray users,process pids,canary.</td> </tr> <tr> <td>User Multi Logon</td> <td>☰</td> <td>No</td> <td>Users logged onto multiple Sun Rays</td> </tr> <tr> <td>Application Histograms</td> <td>☒</td> <td>No</td> <td>Description</td> </tr> <tr> <td>PRSTAT Histograms</td> <td>☒</td> <td>No</td> <td>Description</td> </tr> <tr> <td>CPU Profiles</td> <td>☰</td> <td>10</td> <td>CPU Profiles for some system processes.</td> </tr> <tr> <td>Graph Pid[s]</td> <td>☒</td> <td>No</td> <td>Web form to graph pids per host dynamically</td> </tr> <tr> <td>DTU Terminal Stat</td> <td>☰</td> <td>No</td> <td>status on Sun Ray dtu's .</td> </tr> <tr> <td>Canary Heatmap</td> <td>☰</td> <td>No</td> <td>canary heatmaps.</td> </tr> <tr> <td>EBC</td> <td>☰</td> <td>No</td> <td>These are the DTU's in the Executive Briefing Center</td> </tr> <tr> <td>DTU Map</td> <td>☰</td> <td>No</td> <td>DTU's by Building</td> </tr> </tbody> </table>	Report/Group Name	Report Type	Has Child	Description	Probe Age	☰	No	Each host's parsed file will be counted in a 15, 30, 45, 60 minute bucket.	Server Drilldown	☰	No	Every server we watch is listed here.	CPU Load (Animated)	☒	No	Description	Application Load Profiles	☰	3	CPU Load profile per server	Configuration	☰	4	Comparison of crypto settings, automount settings, gnome settings, and common usage.	User's CPU	☰	No	Regression graphs for cpu,active sun ray users,process pids,canary.	User Multi Logon	☰	No	Users logged onto multiple Sun Rays	Application Histograms	☒	No	Description	PRSTAT Histograms	☒	No	Description	CPU Profiles	☰	10	CPU Profiles for some system processes.	Graph Pid[s]	☒	No	Web form to graph pids per host dynamically	DTU Terminal Stat	☰	No	status on Sun Ray dtu's .	Canary Heatmap	☰	No	canary heatmaps.	EBC	☰	No	These are the DTU's in the Executive Briefing Center	DTU Map	☰	No	DTU's by Building
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Simple System Monitoring Application

Reports: Animated Load



Canvas: 1200
Data sampled in one hour period starting at 11 hours



Simple System Monitoring Application

Reports: Application Heat Map



File Options Help

default tm3

FC 3880

srl-ubrm-20	srl-ellg-08	srl-unw k-04	srl-ubu r-02	srl-eg mp-06	srl-eml n03-02	srl-eg mp-03	srl-ub rm-01	srl-ub rm-08	srl-ub rm-02	srl-cs ao03-	srl-eg mp-11	srl-ep ar01-0	srl-ep ar01-0	srl-u mpk-1	srl-un wk-08				
	srl-epar01-04	srl-usca-17	srl-egm p-16	srl-em ad07-0	srl-epr g05-01	srl-ez rh04	srl-eg mp-2	srl-el lg-09	srl-e par01	srl-e prg05	srl-u bur-0	srl-ui ta01-	srl-c bh03-	srl-c bh03	srl-ea ft02-	srl-eg mp-1			
srl-ubur-03	srl-egmp-18	srl-emad 07-03	srl-egm p-12	srl-eg mp-21	srl-ubr m-15	srl-u nwk-	srl-u bma-1	srl-e kst0	srl-e mln0	srl-e llg01	srl-e llg-0	srl-e mad	srl-e bma-	srl-u mpk	srl-u sca-0	srl-e mark0	srl-e mln0		
	srl-ellg-05	srl-ubur-08	srl-epar01-06	srl-eg mp-07	srl-ubr m-14	srl-el mrk0	srl-u lg-03	srl-u bma-	srl-u srh0	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	srl-u sr-ub03	
srl-epar01-02	srl-ubrm-17	srl-emad 07-06	srl-epar01-07	srl-eg mp-15	srl-em ad07-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	
srl-ellg-04 UK	srl-ubrm-06	srl-ubur-07	srl-ubr m-07	srl-um pk-23	srl-ubr m-19	srl-ebu d01-0	srl-u mpk-	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0
srl-egmp-02	srl-ubrm-12	srl-enhp01-01	srl-eaft 02-02	srl-ubr m-16	srl-cty o03-11	srl-e mad0	srl-u mpk-	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0	srl-u bur-0
srl-emad07-01	srl-uita01-04	srl-ellg01-03	srl-egm p-04	srl-un wk-06	srl-enh p01-02	srl-us ca-09	srl-u sca-0	srl-u vnn0	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01	srl-u ita01

Details of selected node

Attribute	Value
(Label)	880
(Number of nodes)	342
Machine	
Server	
Average Users	40.7982
Average Deltasecs	76.0351
Average Runq	2.6427

Main Legend Filters Hierarchy

Label: (Name)

Size: Runq

Color: cpu avg

Maximum depth: [0] 1 2

Aggregate: Average

Scale: Linear Square Root Logarithmic

Color Binning: Equally spaced bins 3

V440

srl-unsh01-05	srl-cbh05-04	srl-upr d-02	srl-us ca-19	srl-up rd-08	srl-up rd-09	srl-uid p02-0	srl-c sao03	srl-u sca-2	srl-2 bh05	srl-c nov0	
		srl-upr d-03	srl-cc cs02-	srl-c clg01	srl-c mex0	srl-c eze0	srl-c sao0	srl-c prd-	srl-c mow	srl-c cbog	srl-c cblr
srl-cccc02-02 Venezuela	srl-unsh01-03	srl-upr d-01	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03	srl-c mex03

V490

srl-efra05-02 Germany	srl-emuc07-04
srl-em uc07-05	srl-em uc07-05
srl-efr a05-01	srl-efr a05-01

V890

srl-usun-09 sfbay
srl-usun-11 sfbay
srl- usun- usun

Simple System Monitoring Application

SSMA at Sun

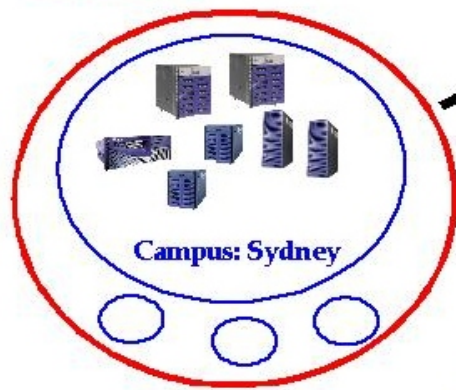


800+ Servers
31,000+ DTUs

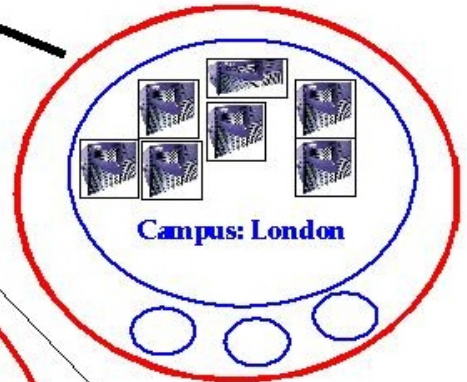


Sun Fire T2000 Cool Threads Server
Broomfield, Colorado

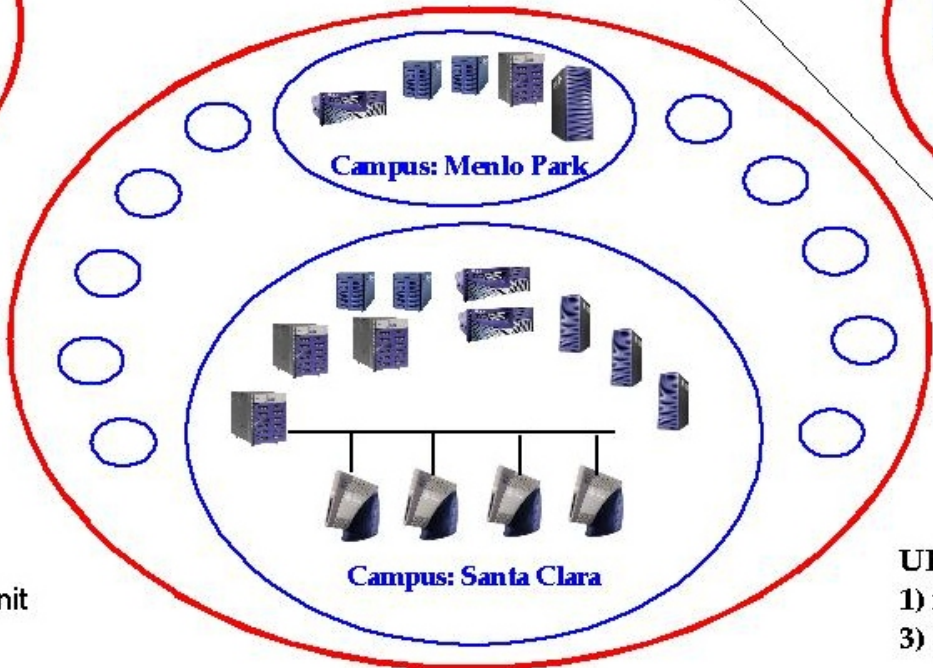
Geo: APAC



Geo: EMEA



Geo: AMER



v880



v440



e4500



e6800



DTU, Data Terminal Unit
(aka DTW)

UPLOAD METHODS
1) nfs "cp /net/.....", 2) mail
3) ftp, 4) sftp, 5) scp, 6) local

Simple System Monitoring Application

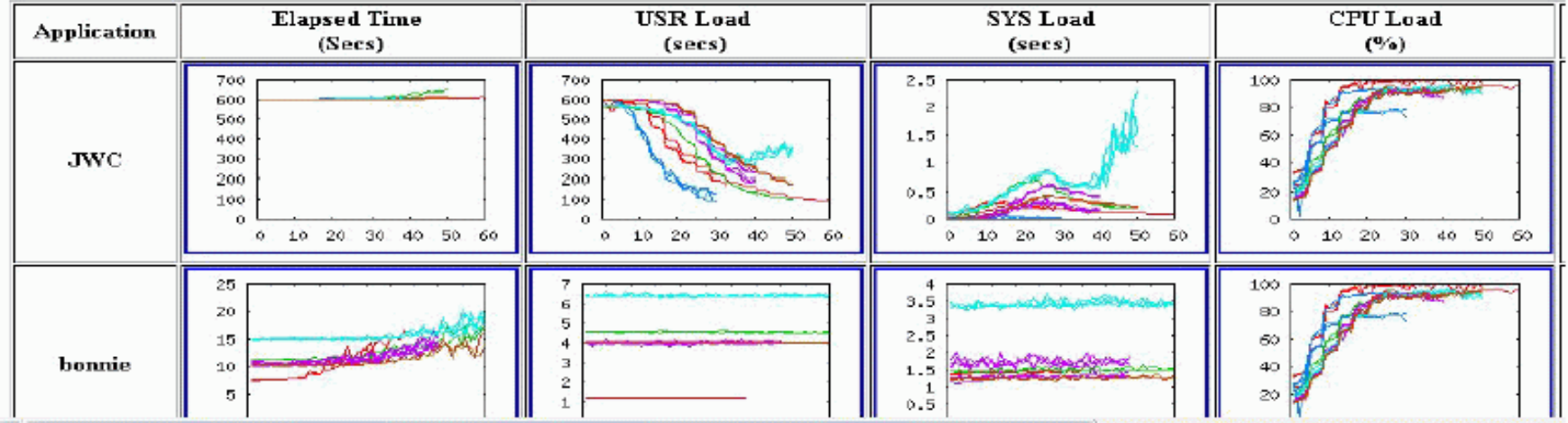


SSMA Load Test

- The load test has the ability to create the exact same load across different platforms
- Currently, it runs on Linux and Solaris.

• CLT - server comparison

• hos-sunray-01.it.sfbay.sun.com		SunOS 5.10 s10_73	7744 MB	4@2390
• lineage.renegades.Central.Sun.COM	Sun Fire V490	SunOS 5.10 s10_69	32768 MB	8@1050
sr-ciso08-01.regina.Canada.Sun.COM	Sun Fire V440	SunOS 5.9 Generic 117171-02 Apr 2004	16384 MB	4@1281
srl-umplc-15.it.sfbay.sun.com	Sun Fire 880	SunOS 5.9 Generic 117171-02 Apr 2004	32768 MB	8@1200
voltage.renegades.Central.Sun.COM	Sun Fire 6800	SunOS 5.10 s10_67	49152 MB	12@750
wgs57-45.Ecd.East.Sun.COM	Sun Fire V890	SunOS 5.10 s10_70	16384 MB	8@1200





History

- Originally created within Sun Microsystems to assist management of many Sun Ray™ servers
- Initial development started in Nov 2003, with the original name of “*Canary*”
- June 22, 2007, Sun released the code:
 - Released under the Apache version 2.0 license
 - Created the SSMA community at <https://ssma.dev.java.net/>

Thank You



SSMA

Keeping your servers singing
and your users smiling