

***Agilent Technologies***

***Centralized Licensing -  
The benefits and costs of going global***

***October 2003***



**Agilent Technologies**



**SoftSummit™**

The Premier Conference on Software  
Pricing, Purchasing and Licensing

# Agilent CLS Team

CLS Licensing Manager

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CLS Development Engineers

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# Central License Server -background

Jointly developed with the design community through two major initiatives:

1. Negotiation of EDA Agreements with Strategic EDA suppliers;
2. Implementation of a Central License Server (CLS) infrastructure.



# Central License Server Program Benefits and Goals

Centralized distribution and management of licenses

Reductions in site administration/supplier management support.

Better access to future tools from our Strategic EDA Suppliers.

Robust systems architecture that could withstand network and hardware failures

Centralized point for license administration

Centralized license support for users

Metrics on license usage for assessment of future licensing needs



# Accomplish Centralizing by Standardizing

**Support** First Level Support doesn't need to be 100% dedicated

Same team member can support multiple suppliers

Resolving license access issues is quicker

## Usage Metric Reports

Over 100 reports per night generated

Standardized reports take reduced time to read & understand

## Development

Keep costs down if using the same infrastructure and tools

Shorter development time to bring on new vendor

## Training

Less time spent on training if tasks are similar per vendor

## Documentation

Less time creating documentation if supplier formats are the same



# License Administration

Macrovision's SAMsuite saves this team's time by providing us with a centralized display from which to manage and control software usage across Agilent's WAN.

Macrovision's SAMreport provides the comprehensive license usage information based on feature, user, host, display, and date and time. We use these reports to manage and control Agilent's software investment. The reporting capability provides the EDA/CLS team with the software license usage data, analysis and graphs needed to:

Purchase the right mix of licenses to meet peak demand

Have the usage data we need to get budgets approved

Optimize software spending so everyone has the licenses they need to be productive



# 24x7 Support

## 24x7 World-Wide Support team

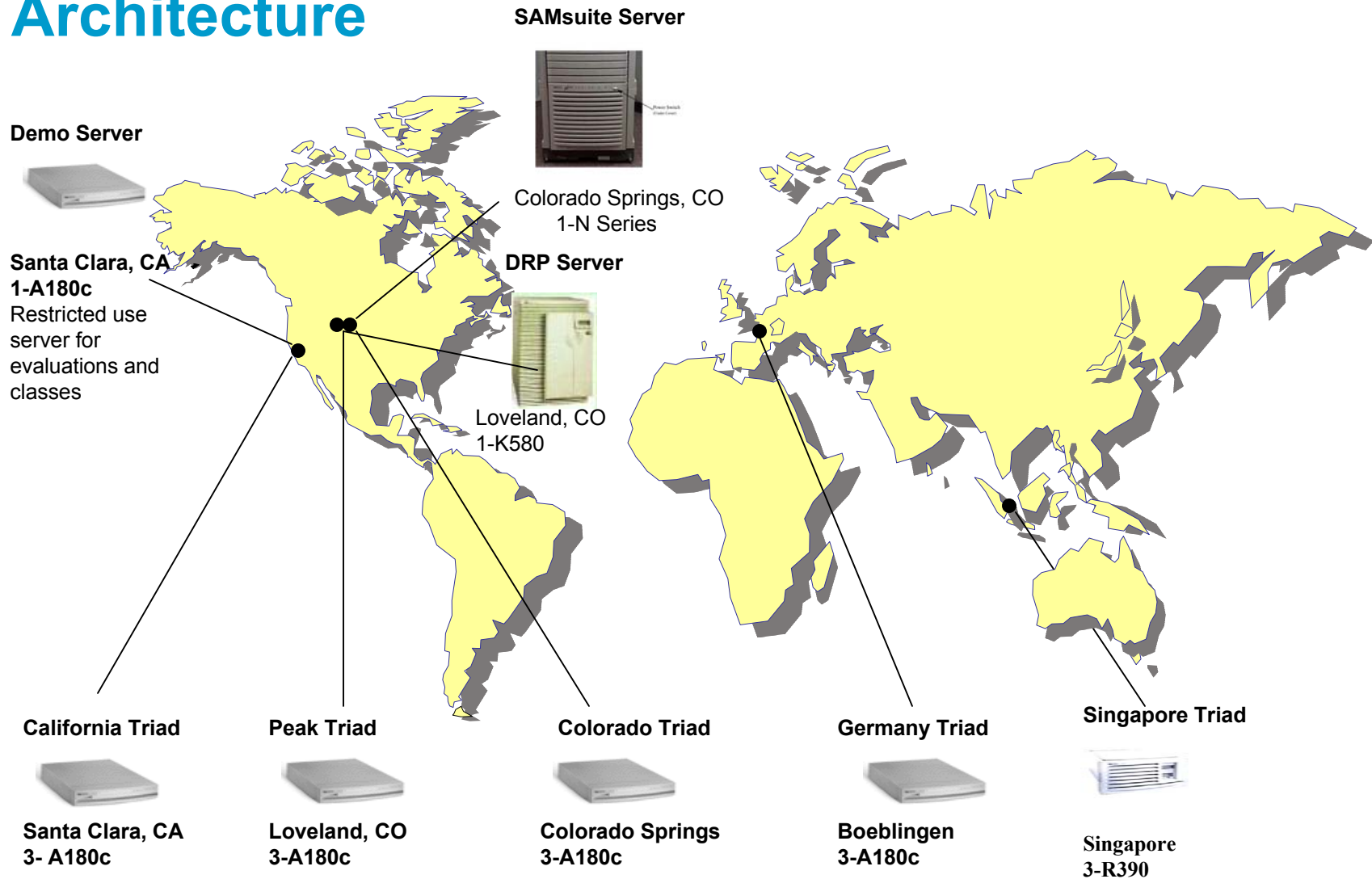
- Website support for direct submittal of support calls into queue
- IT Help Desk 24X7 for User phone calls

## CLS Website provides the following information on each Supplier:

- When the licenses are first available
- General information - not application specific
- License distribution across Agilent
- Who/how to call for licensing support
- Who to call for application support
- Supplier daemons covered by the license agreement
- Usage reports



# Central License Servers Architecture





# Why is it so Complex?

## It just takes 5 minutes to hang a license ...

### Customer Information

- User Mailing List
- Site Contact Mailing List
- Monthly user count
- Data mining for user location
- User Site Location (FLEXlm LM\_PROJECT)
- User login lockdown for evals/classes (FLEXlm options)
- Customer Database

### System Level Support

- Network (hosts)
- DNS (resolv.conf)
- Time Keeping (ntp.conf)
- Port Recovery (nnd.conf)
- Lan Hardware Recovery (/dev/lan0 check)
- SNMP Recovery (mib2agt )
- Performance Monitoring (Measureware)
- Communication (sendmail)
- Operating System Optimization (kernel parameters)
- System communication (rsync)
- DRP System(s) Recovery

### License Alarms

- Vendor daemon down
- Server down
- Expiring Licenses
- One Redundant server down

### Hosting Licenses

- Install licenses
- License File Revision Control
- Distributing binaries
- Server redundancy (hardware failure)
- Server distribution (WAN failure)
- Server status/license availability page
- Web-based Server Status/license availability
- WAN Challenged Policy

### License Asset Management

- Extended Usage Report
- Denial Analysis
- Peaking License Report
- Watch List Report
- CLS Program Metrics

### Customer Configuration

- HPUX 10.20/11.00
- PCCOE & Non PCCOE
- Sun
- Linux

### 24X7 Customer Support

- Release Hung Licenses
- Configuration assistance
- Environment troubleshooting
- License Access
- Researching Usage

### Remix Support

- Product to Feature Mapping
- Feature to Product Mapping
- License Pre-remix verification
- Audit of remixed licenses
- Real Time report on products

### Reports for License Asset Management

- High Water Mark
- Usage Summary By User
- Usage Summary By Feature
- Usage Summary By Location
- Usage Efficiency
- Usage Over Time
- Usage Distribution
- Business Distribution



Carole Farber

*Scoping the Level of Complexity of  
Supplier Implementation in the  
Centralized Environment*



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# Scoping the Level of Complexity of Supplier Implementation in the Centralized Environment

- **Supplier Resources for the Centralized Environment**
- **Supplier Licensing Model**



# Scoping The Level of Complexity

## **Level 1 ( 3+ month rollout - plus 1 day per site)**

Flexlm-based license model using file redirection  
(LM\_LICENSE\_FILE=port@host)

## **Level 2 ( 4+ month rollout - plus 1 day per site)**

Flexlm-based license model using file indirection (local license file or registry)

## **Level 3 ( 4+ month rollout – plus 1 day per site)**

Non-Flexlm based license model (proprietary, or other third party licensing mechanism)



# Scoping the Level of Complexity (cont)

## Other Criteria Affecting Complexity

Are Product feature names the same on all servers?

Do inactive features check back in after x hours of non-use?

Is the Imhostid based on CPU address rather than LAN address?

Are there products that call for un-needed licenses?

Has the FLEXIm TIMEOUT and auto-save feature been implemented in the product?



# Scoping the Level of Complexity (cont)

## Products that are not good candidates for the CLS

Server redundancy cannot be implemented with the licensing model.

If the product is not FLEXIm-based and can't be SAMwrapped into the CLS environment.

Products that have not been thoroughly tested by the Supplier for redundant servers distributed across multiple locations:

- Simulated hardware failure where master server goes down, slave takes over. Existing licenses and new requests roll to new master.
- Simulated network failure where entire redundant triad is not accessible. Existing licenses and new requests roll to next redundant triad's master server.
- Licensing model introduces extensive latency in accessing the license
- Licensing model does not support a variable string length of 512 characters on Unix and 256 characters on PC



# SAMwrap Functionality

- Wraps the application binary located on the client system or the application server.
- The original binary name is renamed to binary.exe.
- The wrapper name replaces the original binary name.
- When the user invokes the application binary, the wrapper is invoked with the license file variable information.
- The license server is requested for a SAMwrap license and is checked out if available.
- The wrapper then runs the original binary.



# What SAMwrapping an application will do

- Allows for option file limits (RESERVE, MAX, INCLUDE, EXCLUDE, LM\_PROJECT, etc)
- Reports can be generated for the SAMwrap usage
- SAMalarms can be generated for the SAMwrap licenses





# What SAMwrapping an application won't do:

- Won't prevent usage of non-wrapped applications or renamed application binary directly.
- Reports can be inaccurate if wrapper wasn't invoked.
- SAMalarms will only flag when the SAMwrap license is not running.
- Only the SAMwrap license can be configured for hardware or WAN redundancy.



# License Hosting

	FlexIm Based Licensing Model		Other Licensing Model	
<b>CLS Requirement</b>	<b>SAM Developed</b>	<b>CLS Developed</b>	<b>SAM Developed</b>	<b>CLS Development</b>
Install Licenses	✓		✓ SAMwrap only	✓ Supplier
License File Revision Control		✓		✓
Distributing binaries		✓		✓
Server redundancy (hardware failure)	✓		✓ SAMwrap only	✓ Supplier
Server distribution (WAN failure)	✓		✓ SAMwrap only	✓ Supplier
Server status/license availability page	✓		✓ SAMwrap only	✓ Supplier
Web-based Server Status/license availability		✓		✓



# Alarms

	Flexlm Based License Model		Other Licensing Model	
<b>CLS Functionality</b>	<b>SAM Developed</b>	<b>CLS Developed</b>	<b>SAM Developed</b>	<b>CLS Development</b>
Vendor daemon down	✓		✓ SAMwrap only	✓ Supplier
Server Down	✓		✓ SAMwrap only	✓ Supplier
Expiring Licenses	✓		✓ SAMwrap only	✓ Supplier
One Redundant server down	✓		✓ SAMwrap only	✓ Supplier



# Reporting

	FlexIm Based License Model		Other Licensing Model	
CLS Functionality	SAM Developed	CLS Developed	SAM Developed	CLS Development
Hi Water Mark	✓		✓	
Usage Summary by User	✓		✓	
Usage Summary by Location	✓		✓	
Usage Summary by Feature	✓		✓	
Usage Efficiency	✓		✓	
Usage over time	✓		✓	
Usage Distribution		✓		✓
Business Distribution		✓		✓



Dawn Hines

*Reporting to manage and control  
software investment*



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# Metric Reporting

- Reports are generated nightly on the SAMsuite control server.
- A typical report covers data from all of the CLS servers for one month for each vendor.
- Different types of SAMreports are available:
  - High Water Mark
  - Usage Efficiency
  - Usage Summaries by User, Feature, or Location



# SAMreport



## Usage Reports

Generated on 2003/03/20 02:18AM

Produced by SAMreport v3.1a

Input Report Logs: /var/SAMreports/logs//2003\_03/daemon\_20030301\_sct1gl1.rl  
/var/SAMreports/logs//2003\_03/daemon\_20030301\_sct1gl2.rl  
/var/SAMreports/logs//2003\_03/daemon\_20030301\_cst1gl1.rl  
/var/SAMreports/logs//2003\_03/daemon\_20030301\_bnt1gl1.rl  
/var/SAMreports/logs//2003\_03/daemon\_20030301\_sgt1gl1.rl  
/var/SAMreports/logs//2003\_03/daemon\_20030301\_lvt1gl1.rl  
Output File Name: /var/SAMreports/report\_logs//2003\_03/daemon/hwrm/hwrm

Report Log(s) Start: Sat, Mar 1, 2003 00:49:42 MST  
Report Log(s) End : Thu, Mar 20, 2003 00:11:20 MST

Report Start Date : Sat, Mar 1, 2003 00:49:42 MST  
Report End Date : Wed, Mar 19, 2003 23:59:59 MST  
Uptime: 18 days 23 hours 10 mins 17 secs (100.00%)

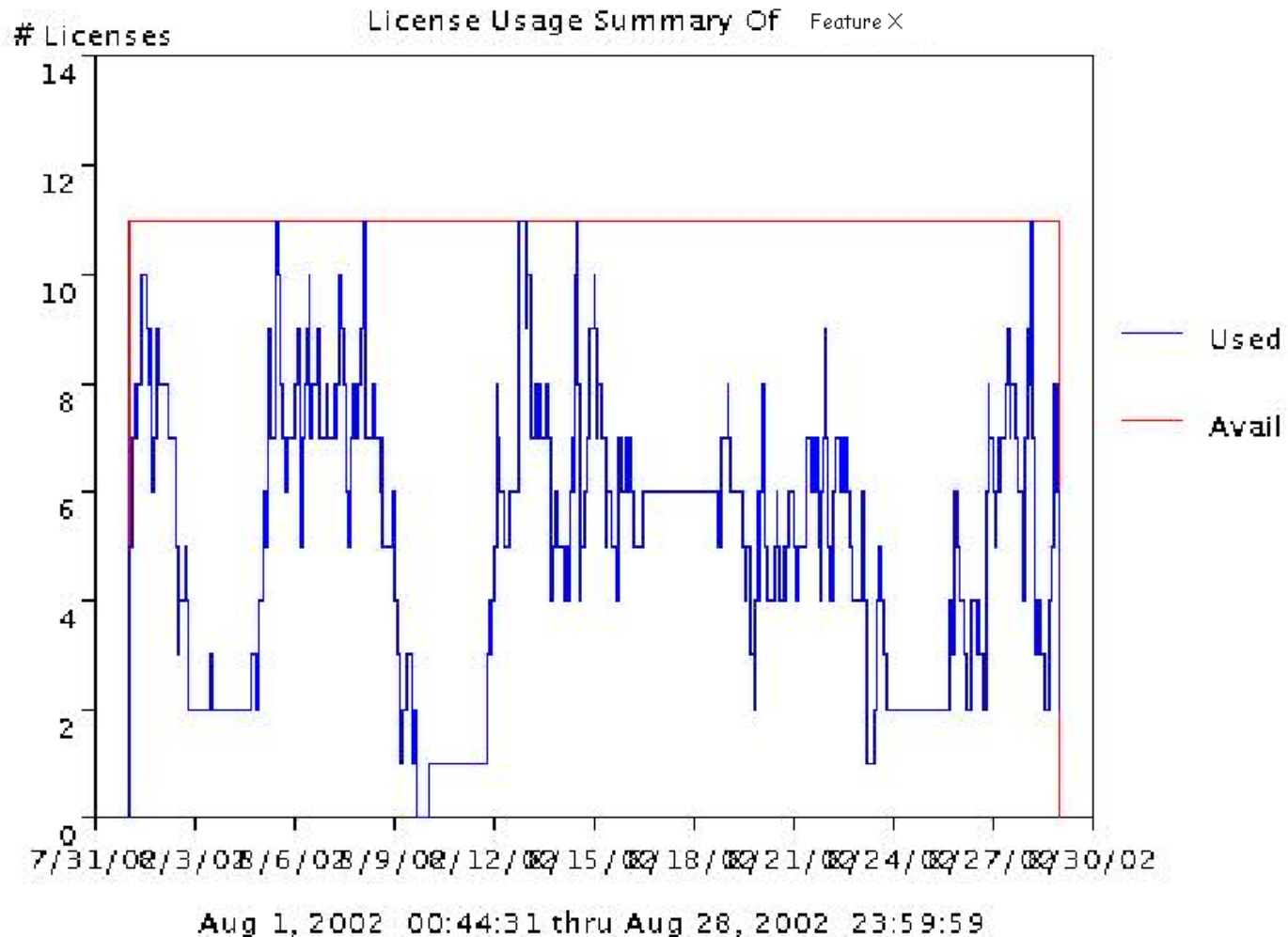
Vendor: daemon

Breakdown by: None  
Filter Start Date: Sat, Mar 1, 2003 00:00:00  
Filter End Date: Wed, Mar 19, 2003 23:59:59  
Event Filters: None

Features With Usage:  
feature1, feature2, feature3, feature4, feature5

Features Without Usage:  
feature6, feature7, feature8, feature9, feature10

# High Water Mark (HWM) Reports





# Usage Summary by User Reports

## Summary For changee:mys

Feature	Max Avail	Hrs Avail	Requests	Used	Queued	Denied	Unsupp	%Denied	Max	Hours	%Used
<b>Feature A</b> ( <a href="#">Product List</a> )	11	7383.746	1	1	0	0	0	0	1	2.015	0.03%
<b>Feature B</b> ( <a href="#">Product List</a> )	11	7383.746	3	2	0	1	0	33.00	1	5.624	0.08%

## Summary For chiewkhnglim:mys

Feature	Max Avail	Hrs Avail	Requests	Used	Queued	Denied	Unsupp	%Denied	Max	Hours	%Used
<b>Feature A</b> ( <a href="#">Product List</a> )	11	7383.746	1	1	0	0	0	0	1	0.001	0.00%
<b>Feature B</b> ( <a href="#">Product List</a> )	11	7383.746	12	0	0	12	0	100.00	0	0.000	0.00%



# Usage Summary by Feature Reports

Summary For Feature X ([Product List](#))

<b>user user_project user_platform user_ipaddr/00000000000000000000 user_product_version</b>	<b>Max Avail</b>	<b>Hrs Avail</b>	<b>Requests</b>	<b>Used</b>	<b>Queued</b>	<b>Denied</b>	<b>Unsupp</b>	<b>%Denied</b>	<b>Max</b>	<b>Hours</b>	<b>%Used</b>
All	11	7383.746	872	589	0	283	0	32.00	11	3099.643	41.98%
Administrator [None] i86_n3 146.208.059.162 2.2	11	7383.746	3	1	0	2	0	66.00	1	0.058	0.00%
Administrator mys i86_n3 141.183.237.245 2.2	11	7383.746	1	1	0	0	0	0	1	0.009	0.00%
Administrator mys i86_n3 141.183.238.017 2.2	11	7383.746	17	11	0	6	0	35.00	1	17.471	0.24%
Administrator mys i86_n3 141.183.242.127 2.2	11	7383.746	3	1	0	2	0	66.00	1	2.039	0.03%
JP4307 cos i86_n3 130.029.115.149 2.2	11	7383.746	1	1	0	0	0	0	1	0.297	0.00%
aizar mys i86_n3 141.183.190.190 2.2	11	7383.746	3	2	0	1	0	33.00	1	8.140	0.11%
ba2660 \ cos\ UNKN i86_n3 130.029.079.078 2.2	11	7383.746	1	1	0	0	0	0	1	0.006	0.00%
ba2660 cos i86_n3 130.029.083.160 2.2	11	7383.746	11	11	0	0	0	0	1	100.576	1.36%



# Usage Summary by Location Reports

## Summary For sjt

Feature	Max Avail	Hrs Avail	Requests	Used	Queued	Denied	Unsupp	%Denied	Max	Hours	%Used
<b>Feature A</b> ( <a href="#">Product List</a> )	11	7383.746	2	2	0	0	0	0	1	29.674	0.40%
<b>Feature B</b> ( <a href="#">Product List</a> )	4	2685.001	7	7	0	0	0	0	1	18.826	0.70%
<b>Feature C</b> ( <a href="#">Product List</a> )	11	7383.746	2	2	0	0	0	0	1	0.496	0.01%
<b>Feat D</b> ( <a href="#">Product List</a> )	11	7383.746	20	20	0	0	0	0	2	44.401	0.60%
<b>Feature E</b> ( <a href="#">Product List</a> )	11	7383.746	12	10	0	2	0	16.00	2	123.779	1.68%

## Summary For sqf

Feature	Max Avail	Hrs Avail	Requests	Used	Queued	Denied	Unsupp	%Denied	Max	Hours	%Used
<b>Feature E</b> ( <a href="#">Product List</a> )	11	7383.746	1	1	0	0	0	0	1	7.988	0.11%

