

Sun Grid Engine at Cadence

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Overview

- About Cadence
- Grid Software at Cadence
- SGE at Cadence
- Wish List
- Future Plans
- Acknowledgements

About Cadence

- ▣ Applications
 - ▣ Electronic Design Automation (EDA)
 - ▣ Target markets: Manufacturing, Telco, Education, and Government
- ▣ Business Objective
 - ▣ Market leader for EDA solutions that speed Advanced Integrated Circuits into volume production
- ▣ Industry Ranking & Revenues
 - ▣ 1.5B FY 2006
 - ▣ Top three (Cadence, Synopsys, Mentor G.,)
 - ▣ 75% of total EDA s/w sales worldwide

Grid Software at Cadence

- ▣ In 2005, due to growth via M&A
 - ▣ LSF 60%, SGE 20%, Condor 20%
- ▣ Since 2005 gradual transition to LSF only
 - ▣ 2007: IT supports only LSF
- ▣ SGE is still used by some small teams
- ▣ Cadence plans to make their R&D products grid ready

SGE at Cadence

- Compute farms
 - Munich, Germany
 - SGE 5.3u3 since 2003.
 - < 100 Servers
 - Spontaneous adoption
 - Sun sales not directly involved
 - San Jose, CA
 - Several SGE 5.3 & 6.0 small farms
 - Tempe, AZ
 - SGE 5.3 (plans to upgrade to SGE 6.1 next month)
 - < 100 Servers

SGE at Cadence

- ❑ IC 6.1.1: SGE and LSF integrated in the GUI
- ❑ Neocircuit: SGE and LSF integrated in TCL GUI & wrappers
 - ❑ a DRM is really the key: runs thousands of simulations distributed by the SGE or LSF.

SGE at Cadence

Virtuoso® Analog Distributed Processing option Job

Job Name

Host ☐ Reuse Job Name After Completion

QueueName Hosts

☐ queue
☐ list
☐ command ☐ Only Use Selected Host

Start Time

☐ now
☐ at
☐ after job(s)

Expiration Time

☐ none
☐ at
☐ after

E-Mail Notification ☒

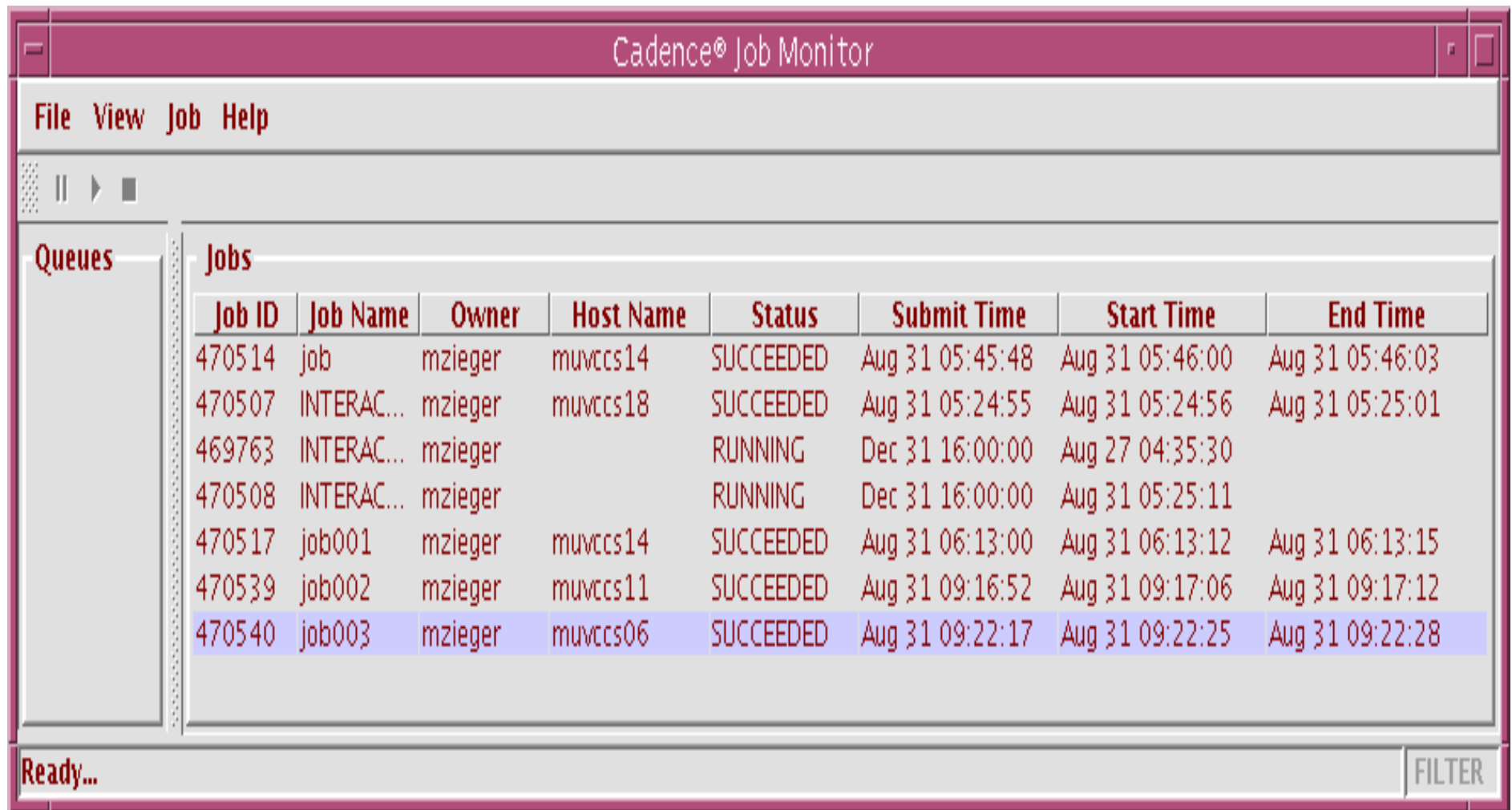
Shell Cmd at Finish ☐

SGE Hard Resources

SGE Soft Resources

SGE Priority

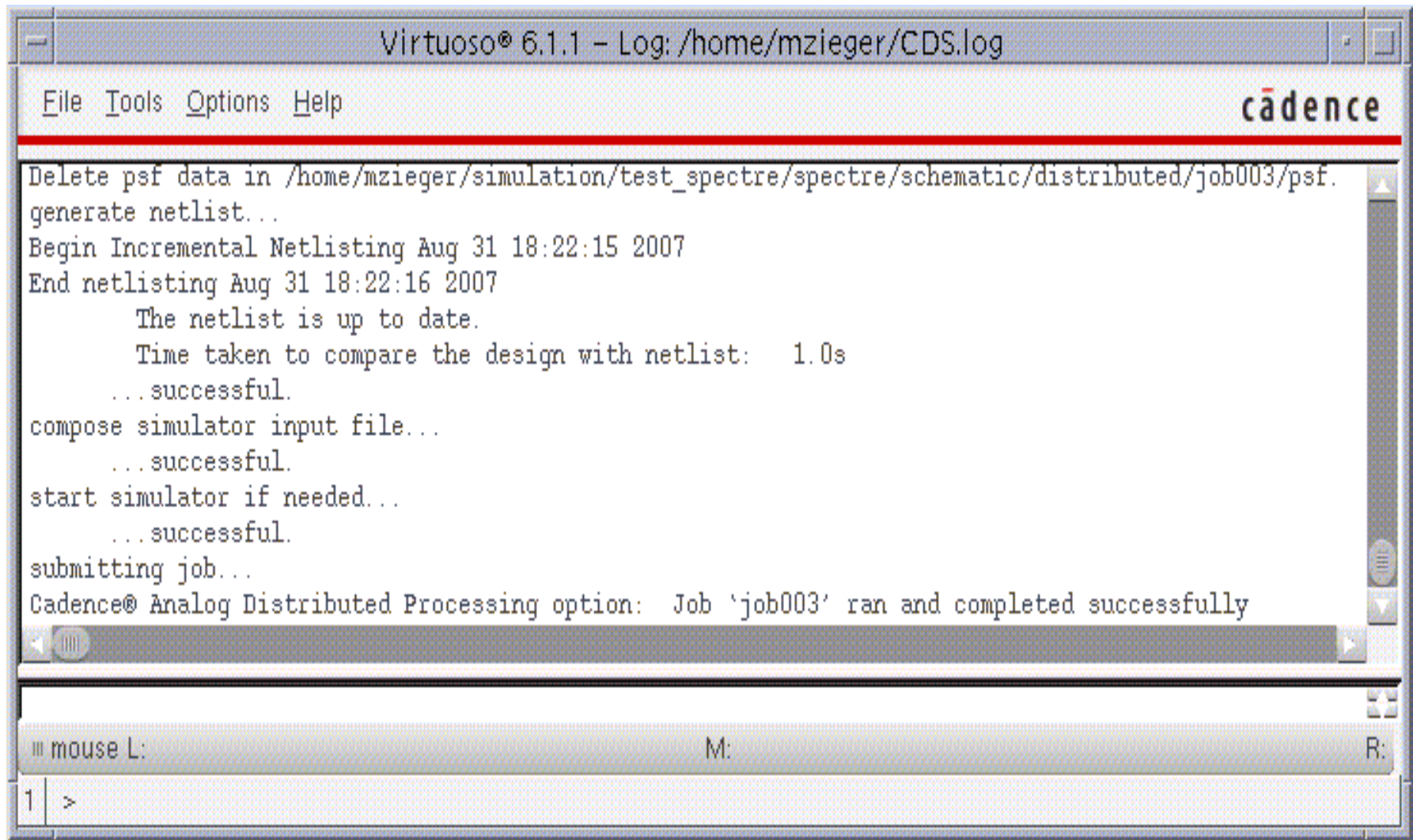
SGE at Cadence



The screenshot shows the 'Cadence® Job Monitor' application window. It has a menu bar with 'File', 'View', 'Job', and 'Help'. Below the menu bar is a toolbar with icons for pausing, playing, and refreshing. The main area is divided into two panes: 'Queues' on the left and 'Jobs' on the right. The 'Jobs' pane contains a table with the following columns: Job ID, Job Name, Owner, Host Name, Status, Submit Time, Start Time, and End Time. The table lists several jobs, with the last one (Job ID 470540) highlighted in blue. The status bar at the bottom shows 'Ready...' and a 'FILTER' button.

Job ID	Job Name	Owner	Host Name	Status	Submit Time	Start Time	End Time
470514	job	mzieger	muvccs14	SUCCEEDED	Aug 31 05:45:48	Aug 31 05:46:00	Aug 31 05:46:03
470507	INTERAC...	mzieger	muvccs18	SUCCEEDED	Aug 31 05:24:55	Aug 31 05:24:56	Aug 31 05:25:01
469763	INTERAC...	mzieger		RUNNING	Dec 31 16:00:00	Aug 27 04:35:30	
470508	INTERAC...	mzieger		RUNNING	Dec 31 16:00:00	Aug 31 05:25:11	
470517	job001	mzieger	muvccs14	SUCCEEDED	Aug 31 06:13:00	Aug 31 06:13:12	Aug 31 06:13:15
470539	job002	mzieger	muvccs11	SUCCEEDED	Aug 31 09:16:52	Aug 31 09:17:06	Aug 31 09:17:12
470540	job003	mzieger	muvccs06	SUCCEEDED	Aug 31 09:22:17	Aug 31 09:22:25	Aug 31 09:22:28

SGE at Cadence



Virtuoso® 6.1.1 - Log: /home/mzieger/CDS.log

File Tools Options Help cadence

```
Delete psf data in /home/mzieger/simulation/test_spectre/spectre/schematic/distributed/job003/psf.  
generate netlist...  
Begin Incremental Netlisting Aug 31 18:22:15 2007  
End netlisting Aug 31 18:22:16 2007  
    The netlist is up to date.  
    Time taken to compare the design with netlist:  1.0s  
    ...successful.  
compose simulator input file...  
    ...successful.  
start simulator if needed...  
    ...successful.  
submitting job...  
Cadence® Analog Distributed Processing option:  Job 'job003' ran and completed successfully
```

mouse L: M: R:

1 >

SGE at Cadence

Diagnostics

Summary

Points	57	Points/Hour	269.509
Mean Time/Point	0:01:22	Total Errors	149
Total Nodes	51	Elapsed Time	0:12:41

Simulations

Name	Avg(s)	Curr #	Errors
TotArea	4.39	2	0
AC	6.8	12	0
AC_OpRegionSim	91.58m	1	0
CMRR	7.37	6	0
GSRR	10.44	3	0
ICMR	9.34	4	0
NOISE	7.44	2	0
OUTSWING	11.28	6	0
PSRR	10.33	3	0
SLEW	23.54	7	0
neocalc	55.49m	3	149

Machines

Name	Jobs
pitl007	1
pitl016	4
pitl008	1
pitl010	4
pitl011	2
pitl012	4
pitl053	2
pitl071	3
pitl055	2
pitl062	2
pitl052	2
pitl061	2
pitl019	4
pitl004	4
pitl005	4
pitl015	3

Cadence IT feedback

- ☐ Sun did not promote SGE to Cadence
 - ☐ director level site visit planned
- ☐ Miscommunication
 - ☐ Cadence existing support contract covers SGE downloads
 - ☐ Not true
- ☐ SGE courses not conveniently offered

Cadence engineering groups feedback

- Munich farm
 - Likes feature not available in LSF: jobs started with the correct UNIX group ID
 - productivity grew 30%-50%
 - Happy with SGE
- San Jose farm(s)
 - Why SGE? Free, easy to install, easy to deploy, easy to use, robust, stable, worked out of the box
 - Low maintenance, simplified operations
 - SGE more than doubled the productivity (they used “rsh” before SGE)
 - Most changed to LSF after Cadence signed a new contract with Platform

Cadence engineering groups feedback (cont'd)

- Tempe, AZ farm
 - cost effective (free), worked quickly, really robust, simple installation
 - looking forward to installing SGE 6.1

Wish List

- Small engineering groups are happy with SGE
- Munich farm
 - features missing: the ability to submit a UNIX command
 - never quite got distributed make to work
- San Jose farm
 - had trouble using several queues with SGE
- Improve “Tickets” documentation
- LSF user friendly :-)

Future Plans

- ▣ < 10,000 cpu-cores within Cadence
- ▣ SGE on the verge of being replaced
 - ▣ Munich farm: Happy with SGE, but similar groups have switched to LSF
 - ▣ San Jose farm: switched to LSF already
 - ▣ Tempe, AZ farm: staying with SGE for the foreseeable future

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