

WorkloadAnalyzer™

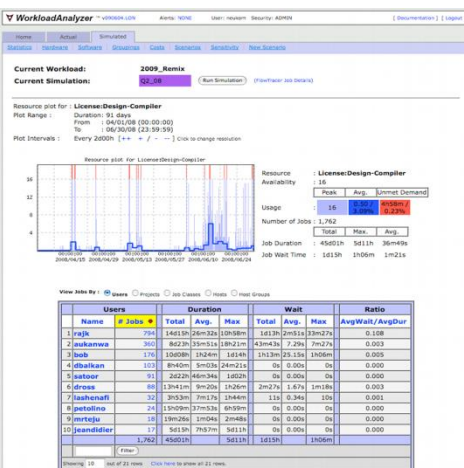
Intelligent compute farm planning



WorkloadAnalyzer™ is the industry's only simulation-based workload analysis and compute farm planning tool. This tool allows you to optimally configure your compute farm based on budgetary goals and in-depth sensitivity analysis. Don't be fooled into thinking you can trust intuition and experience alone. In many cases how you should alter your compute farm configuration will be counter-intuitive. Complicated problems require sophisticated solutions! Allow WorkloadAnalyzer™ to show you the way.

Benefits

- Identify critical compute farm resources through Sensitivity Analysis
- Make predictions on the impact of changing your compute farm configuration through Scenario Exploration
- Display HW/SW Utilization Statistics based on Users, Groups, Hosts, Host Groups, Projects, Queues, and Licenses
- Let Sensitivity Analysis Directed Optimization show you how to spend/cut your budget
- Use Workload Editing to create new workloads which represent a new product cycle, or the addition/removal of team members



The Problem

Do you really know how your compute farm is handling your workload?

- What are the most critical resources/bottlenecks?
- How should you mix your licenses so that the least amount of wait time is experienced?
- If you are planning to hire a senior level HW Design Engineer and two Verification Engineers, how would their additional workloads impact the compute farm throughput?
- What is needed more: CPUs or licenses?
- Which HW resources are over-utilized or under-utilized, such that they should be either augmented, replaced, or retired?
- Can you save 20% of the budget without losing too much throughput?

Technological Breakthrough

Simply monitoring the utilization of licenses and CPUs is not sufficient to answer these important questions. Simulation based technology is needed to correctly determine the behavior of a specific compute farm configuration.

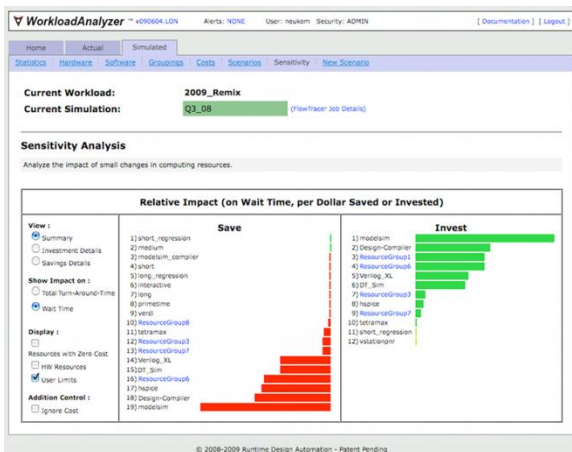
This revolutionary tool takes historical workloads from NetworkComputer™, Platform Computing's LSF™ or SGE™* and performs in-depth analysis on the workload to yield:

- HW/SW Utilization Statistics
- Utilization statistics based on Users, Groups, Hosts, Host Groups, Projects, Queues, and Licenses
- Sensitivity Analysis
- Sensitivity Analysis Directed Optimization
- Scenario Exploration
- Workload Editing

* Planned

Sensitivity Analysis

WorkloadAnalyzer™ automatically performs Sensitivity Analysis on a workload after a reference simulation has been run. During Sensitivity Analysis, any resource that has experienced saturation (when a job had to wait for the resource to become available), will be selected as a “resource of interest”. A new simulation will then be produced where this resource’s count will be incremented and/or decremented by one to see how this change will affect overall job wait time and turn-around time. A final report is produced ranking the effect of all these simulations taking the cost of the resource into consideration. This reports acts as a recommendation guide for which resources to purchase or cut.



WorkloadAnalyzer™ v090604.LDN Alerts: NONE User: neusim Security: ADMIN [Documentation] [Logout]

Home Actual Simulated

Statistics Hardware Software Resources Costs Scenarios Sensitivity New Scenarios

Current Workload: 2009_Remix
Current Simulation: Q3_08 (New/Alter Job Details)

Sensitivity Analysis
Analyze the impact of small changes in computing resources.

Relative Impact (on Wait Time, per Dollar Saved or Invested)

View: Summary, Investment Details, Savings Details, Show Impact on: Total Turn-Around-Time, Wait Time, Display: Resources with Zero Cost, New Resources, User Licenses, Addition Control: Ignore Cost

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Home New Workload Analysis

Workload Name: 2009_Remix
Workload Stats: Duration: 1 day 12h 10m 49s, Cost: \$1,453,700, Size: 16,534 jobs, Multitask: 4 jobs
Analysis Window: Duration: 28 days, From: 05/05/09 (00:00:00) to 05/30/09 (23:59:59), Size: 16,534 jobs, Scheduler: NC
Control: Build ready (New/Alter Job Details), Some simulations running (New/Alter Job Details)

HISTORICAL WORKLOAD:
Click on one of the quarterly simulations below to view results.
Quarters: Q2_09, Q3_08, Q4_08, Q1_09

EDITED REFERENCE WORKLOAD:

Name	Budget			Cost			Wait Time			TaT		
	Remainder	Δ% Ref	Δ% Prev	Total	Δ% Ref	Δ% Prev	Total	Δ% Ref	Δ% Prev	Total	Δ% Ref	Δ% Prev
WE_ref	\$175,000	N/A	N/A	\$4,376,351	N/A	N/A	3621h	N/A	N/A	4211h	N/A	N/A
WE_search1	\$169,000	3.43%	3.43%	\$1,453,700	-66.78%	-66.78%	2600h	-48.24%	-48.24%	4211h	0.08%	0.08%
WE_search2	\$153,000	6.86%	3.53%	\$1,453,700	-66.83%	0.41%	1602h	-73.08%	-44.13%	4211h	-0.20%	-0.28%
WE_search3	\$157,000	10.29%	3.68%	\$1,465,700	-66.51%	0.41%	1763.7h	-81.07%	-34.55%	4211h	-0.17%	0.03%
WE_search4	\$148,000	15.43%	5.73%	\$1,474,700	-66.30%	0.61%	1180.1h	-88.15%	-37.42%	4211h	-0.09%	0.08%
WE_search5	\$139,000	20.57%	6.08%	\$1,483,700	-66.10%	0.61%	683.9h	-92.83%	-39.68%	4211h	-0.19%	-0.10%
WE_search6	\$130,000	25.71%	6.47%	\$1,492,700	-65.89%	0.61%	383.9h	-96.08%	-48.13%	4211h	-0.15%	0.04%
WE_search7	\$117,000	33.34%	10.00%	\$1,505,700	-65.59%	0.87%	185.6h	-97.95%	-47.76%	4211h	-0.20%	-0.05%
WE_search8	\$104,000	40.57%	11.11%	\$1,518,700	-65.30%	0.86%	182.1h	-98.54%	-28.62%	4211h	-0.13%	0.08%
WE_search9	\$91,000	48.00%	12.50%	\$1,531,700	-65.00%	0.86%	180.6h	-98.81%	-18.42%	4211h	-0.14%	-0.02%
WE_search10	\$58,000	66.86%	36.26%	\$1,564,700	-64.25%	2.15%	54h03m	-99.03%	-18.88%	4211h	-0.15%	-0.01%
WE_search11	\$49,000	72.00%	15.52%	\$1,573,700	-64.04%	0.98%	53m27s	-99.04%	-1.11%	4211h	-0.15%	0.00%
WE_search12	\$12,000	93.14%	75.51%	\$1,610,700	-63.20%	2.35%	53m16s	-99.03%	-0.34%	4211h	-0.15%	0.00%

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Sensitivity Analysis Directed Optimization

The true power of **WorkloadAnalyzer™** lies in its Sensitivity Analysis Directed Optimization capability, which tells you which licenses or machines to purchase (or cut), and how much, given a specific budget, such that doing so would produce the greatest decrease (or smallest increase) in total wait time. The result is an optimally configured resource allotment based on budgetary goals.

Scenario Exploration with Workload Editing

Analysis of a historical workload will shed light on what happened in the past. Equally important is being able to forecast the behavior of a future compute farm configuration or workload scenario. This can be accomplished using the **WorkloadAnalyzer™** Scenario Exploration and Workload Editing features.

Scenario Exploration allows you to individually configure the number of available licenses and HW resources. For example, you can analyze what would happen if you add 20 new more powerful Linux CPUs, or if you remix your EDA licenses.

Workload Editing allows you to take an existing workload and replicate all the jobs pertaining to a specific project or a user, and offset them by a period of time, such that a new workload can be produced representing a new product cycle.

Using Workload Editing with Scenario Exploration is a powerful way to forecast how future workloads will affect a given compute farm's throughput

The Conclusion

WorkloadAnalyzer™ is a powerful analysis tool for any CAD Manager, VP Engineering, or CFO. Complicated problems require sophisticated solutions. Take the guesswork out of compute farm planning with **WorkloadAnalyzer™**.

RTDA Software Family

LicenseMonitor™: License usage tracking for monitoring operations and controlling costs.

NetworkComputer™: Fastest job scheduling system.

FlowTracer™: Platform for faster development and execution of design flows.

WorkloadAnalyzer™: Planning system that uses simulation to analyze “what-if” scenarios in the search for the optimal configuration of software and hardware resources.

About Runtime Design Automation

Runtime Design Automation (RTDA) provides enterprise resource management tools to monitor and manage resources, workload, and workflow. Founded in 1995, the company is privately held, with headquarters in Santa Clara, California.

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