

GRID ENGINE TUNING

Service Offering

In this document, Univa UD outlines a service offering for custom-tuning a Grid Engine installation to optimize performance.

THE BASICS

CHALLENGE	Tuning a Grid Engine cluster configuration is a complex and time consuming task, which often goes undone as more emphasis is placed on evaluating use cases and infrastructure details. The results are sub-optimal performance and issues like execution delays and missed deadlines.
SOLUTION	Univa UD has developed a systematic approach for tuning Grid Engine installations so that customers maximize benefits.
OFFERINGS	<p>Univa UD Grid Engine service offerings include:</p> <ul style="list-style-type: none"> • Performance Tuning • Configuration Design • Environment Design • Operations Design and Implementation • Monitoring Design and Implementation • Run Book • Operation Readiness Testing • Operations Training • User Training
FOR MORE INFORMATION	Request a consultation today at http://www.univaud.com/about/contact/request-info.php

Overview

When choosing a cluster software stack, most companies undertake a detailed product evaluation phase in which they consider factors such as software license and support costs, maintenance issues, their own use cases, and their existing and planned infrastructure.

However, they often do not pay equal attention to their Grid Engine configuration, which may result in sub-optimal cluster performance and issues like delays for execution of high priority jobs and missing deadlines. These problems are directly related to the company's ability to scale cluster usage: As the user base grows and the user computing needs become more diverse, it becomes more likely that the company would benefit from investing time and resources into properly designing and implementing their cluster configuration.

Our Approach

Univa UD has developed a systematic approach for understanding the computing needs of our customers and helping them maximize benefits from their computing resources and Grid Engine installations.

Depending on a specific situation and set of customer needs, Univa UD can help in several different ways:

- **Cluster Performance Tuning:** This type of engagement typically takes 1-2 weeks, and involves the following:
 - 1) Gathering information about different types of applications that are or will be running on the cluster via Grid Engine, and cataloging various resource requirements (cpu, memory, storage, network) that those applications might have.
 - 2) Understanding all application service level agreements (SLAs) that might affect design.
 - 3) Collecting information about the hardware infrastructure and plans for the future.
 - 4) Presenting findings and suggestions for cluster configuration changes.
 - 5) Helping to implement cluster configuration changes.
- **Cluster Configuration Design:** This type of engagement is more involved than basic performance tuning. It typically takes 4-6 weeks, and involves the following activities:
 - 1) Gathering information about different types of applications that are or will be running on the cluster, and cataloging various resource requirements (cpu, memory, storage, network) that those applications might have.
 - 2) Understanding application SLAs that might affect cluster design.
 - 3) Collecting information about the hardware infrastructure and plans for the future.
 - 4) Gathering historical cluster usage data (number of users, number of jobs submitted daily, etc.), as well as a range of estimates for the future usage.
 - 5) Developing quantitative models of cluster usage and utilize them to obtain predictions for cluster resource needs under various scenarios (e.g., typical cluster usage scenario, maximum anticipated load scenario, etc.).
 - 6) Presenting findings and cluster configuration design in a comprehensive report.
 - 7) Helping to implement cluster configuration design as necessary.
- **Comprehensive Cluster Design and Implementation:** In addition to the cluster configuration design offering, this type of engagement offers a full range of other services that help your Grid Engine cluster running smoothly. Most engagements take several weeks, though the final timeline determination depends on the specific needs and current infrastructure of the customer. Offerings include:
 - o **Cluster Environment Design:** Companies relying DRM software like Grid Engine for managing their computing jobs usually require implementation of several different cluster environments (e.g., development, integration/test, QA, production). The Cluster Environment Design document helps accomplish this by carving out available computing resources for different environments, specifying required software installations, providing details for cluster logging, outlining security issues, etc.
 - o **Cluster Operations Design and Implementation:** Although experienced administrators usually find Grid Engine command line and GUI tools sufficient for performing daily administrative tasks, in many cases companies may benefit from developing custom operations tools that provide additional logging and simplify certain operational tasks so that they can be performed by less experienced staff.

“The general availability of UniCluster Express is good news for users of Sun Grid Engine. Univa UD provides customers with a unique offering that combines quality integration of leading open source components with full support from Univa UD. Customers get a fully supported, quality HPC cluster environment from one vendor.”

– FRITZ FERSTL, DIRECTOR OF GRID ENGINE GROUP, SUN MICROSYSTEMS

- o **Cluster Monitoring Design and Implementation:** Regardless of the number of users and types of jobs running on the cluster, monitoring jobs and performance is always one of the most important parts of any cluster installation. It allows cluster operators and administrators to detect possible problems and react to those in a timely manner. In addition, collecting and analyzing performance data enables one to understand cluster performance under various scenarios, which in turn may lead to further optimizations.
- o **Cluster Run Book:** In many cases companies rely on operations/support personnel to monitor and run their computer hardware and software systems on a day-to-day basis. The Cluster Run Book document outlines steps that have to be performed for different operational tasks, without requiring specialized Grid Engine knowledge. Such a document usually relies on custom monitoring and operational tools.

Why UniCluster for Grid Engine users?

Running UniCluster Express with an existing Sun Grid Engine installation saves users time and money in building and managing clusters. This fully supported open source product delivers the complete range of cluster computing functionality in a simple, fully integrated install – extending your SGE solution for greater performance without additional cost or overhead.

- o **Cluster Operational Readiness Testing (ORT):** For many companies any cluster downtime may equate to lost revenues. The ORT testing helps ensure that the cluster is ready for production, that the Cluster Run Book document is complete, and that all monitoring and operations tools operate as expected.
- o **Cluster Operations Training:** Training sessions and written tutorials targeted at operations staff are usually extremely beneficial. They can be used for quickly bringing operations personnel up to speed on all available monitoring and operational tools.
- o **Cluster User Training:** User training sessions and written tutorials help educate cluster users about Grid Engine functionality relevant for them (e.g., how to submit different types of jobs, how to monitor their jobs, etc.).

Regardless of the level of engagement and services chosen, Univa UD can help companies run and use their grids in the most optimal way.

Audience

Univa UD's Grid Engine Tuning process is designed with the needs of cluster project managers and technical staff in mind.

Working with these personnel, Univa UD experts will ensure cluster performance is optimal based on their specific requirements. As companies develop a larger user base with more diverse needs, the benefits of properly designing and implementing their cluster configuration will be of particular relevance to the cluster project managers and technical staff.

World-Class Delivery Teams

Univa UD's professional services and engineering departments are staffed by architects, engineers, and team leaders with diverse backgrounds and extensive experience in grid and cluster computing. Univa UD Professional Services provides the technical savvy and business value you need to ensure your Return on Investment (ROI). Whether your goal is to proceed cautiously, to evaluate how resources can be used most effectively, or to accelerate production results in a fraction of the time possible with alternative approaches, Univa UD Professional Services offers a variety of options to ensure that your organization can move forward at the pace that suits you.

About Univa UD

Univa UD is the leading provider of high-performance computing (HPC) systems management software for the complete distributed computing lifecycle. Univa UD products simplify the complex nature of deploying and operating cluster and grid computing environments and save customers time and resources while giving them confidence that their solution will perform as expected. Hundreds of Global 2000 companies come to Univa UD to build and operate their HPC infrastructures, from small-scale work group clusters to enterprise grids. With a community-enabled open source model and a focus on making business easier for our customers, Univa UD is advancing the vision and practice of HPC. Visit us at www.univaud.com.