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TAMING UNIX™
Volume I – *An Introductory Guide to Performance Management for HP-UX*

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ABSTRACT

This paper is an overview of my latest book, TAMING UNIX™ – *An Introductory Guide to Performance Management for the HP-UX System Administrator*. While veteran UNIX users will find value with this book, especially in some of the more advanced chapters, it is intended to principally be an introductory level manual for those who are new at performance management on UNIX systems. While primarily targeting Hewlett-Packard's implementation of UNIX, HP-UX, the greater majority of this book will be of value to nearly all UNIX variants. A special appendix is included for individuals that have an MPE/iX background. After reading the book, one will be better equipped to monitor, manage, and maximize performance of HP-UX systems.

OVERVIEW

TAMING UNIX™ is divided into two sections with numerous appendices and an extensive UNIX performance glossary. Section one is considered to be a textbook introduction to HP-UX performance, while section two delves into numerous ideas and tools for practically monitoring and managing performance. Over seven dozen figures, tables and illustrations enhance and highlight important concepts.

What follows is a chapter-by-chapter description of the contents of TAMING UNIX.

CHAPTER ONE – HP-UX System Performance... From a User's Viewpoint

Many books on performance seem to focus on the “tech-head” side of things almost exclusively, ignoring some of the practical and basic aspects. This chapter takes a user's view as well as management view of system performance. What about cost, accuracy, reliability as performance factors? How is “service” defined?

CHAPTER TWO – HP-UX System Performance...

This chapter attempts to lay a foundation of definitions. Computer speed is discussed and some of the fiction which revolves around the topic of “MIPS.” We also discuss the difference between physical and logical resources. The proverbial “knee in the curves” is introduced at this point. A bit of queuing theory is tossed in to take you “over the edge” for a brief moment.

CHAPTER THREE – HP-UX Performance Angles

Another practical side to this book is the concept of the forest and trees. This chapter acquaints the user with the various aspects, or viewpoints, of system performance. Like the seven blind men trying to describe an elephant, so too, UNIX performance can be seen from different angles. Just what is a “global” view of performance? Why is a workload view of performance different than an individual process view? These and other questions are answered here.

CHAPTER FOUR – Covering the Performance Bases

If you are a sys-admin type, you’ll appreciate the four different bases of UNIX performance management. You will be familiar with the following concepts of performance crises, capacity planning, problem solving and the all-too-often ignored casual mode of just learning about your system’s unique performance signature.

CHAPTER FIVE – Primary System Resources

This chapter begins the classical discussion of system performance resources. The CPU resource is explained and broken down into its various “states.” An illustrative experiment reveals some interesting aspects of CPU performance. A simulation package, appropriately named Pigpen™ is used to show the effect on HP-UX transaction throughput and response times with different memory configurations. Secondary storage (disk I/O) is discussed at an entry level, along with related topics of the HP-UX file system, buffer cache, NFS, as well as other less common system resources.

CHAPTER SIX – Performance “Not-So-Basics”

This chapter begins to go down deeper into UNIX internals. Topics such as how HP-UX creates a process and how processes are scheduled and managed are covered extensively. Numerous figures and real-life data are presented to help take some of the mystery out of the UNIX kernel activity. Features which are specific to HP’s HP-PA RISC architecture are discussed with respect to memory management. Memory activities such as paging, swapping, and process deactivation are discussed, especially with respect to what an administrator needs to watch for... signs of memory pressure. The HP-UX file system is discussed in more depth.

SECTION TWO - CHAPTERS SEVEN THROUGH TEN

Chapter seven begins section two. Section two is entitled “Nearly a Jillion Ways to Monitor, Manage and Maximize HP-UX Performance.” The four chapters in section two are comprised of numerous, discrete ideas which all contribute to the very practical side of HP-UX system performance management.

Chapter seven focuses attention on numerous ways to monitor performance. Since effective monitoring lies at the heart of any performance gameplan, this chapter discusses various tools which are supplied as standard fare with HP-UX. Also discussed are HP and third party tools.

Chapter eight deals with load balancing techniques; ways to maximize a system for best response time and/or transaction throughput.

Chapter nine covers a plethora of administrative considerations to help maximize system performance.

Chapter ten provides a number of ideas which will help administrators more effectively deal with performance issues that are more directly related to hardware and configuration issues.

APPENDICES

Seven appendices round off the end of the book to address a number of side issues. Appendix A is a performance “pulse points” chart. This will help the user know the meaning and importance of specific performance metrics. Appendix B attempts to clarify the clouded issue of UNIX process terminology. Appendix C is an HP 9000 model summary chart showing the performance rating, CPU speed/type, etc. for over 80 HP 9000 systems. Appendix D will appeal to those whom have an MPE or MPE/iX background. It summarizes some of the common and different features of each system with respect to performance. Appendix E demonstrates the cost of various process executions for activities such as logins and program execution. Appendix F provides the source code for a simple memory object freezing program. Appendix G is a UNIX performance glossary.

The reader will hopefully be entertained and encouraged by the various quotes throughout the book which are unrelated to the subject of performance!

Taming UNIX Volume I is an introductory book for those who are either new to HP-UX performance management or who have a strong familiarity with MPE/iX and are migrating to HP-UX.

ABOUT THE AUTHOR

Robert Lund has worked with Hewlett-Packard systems since 1979 in various capacities such as: Programmer/Analyst, System Manager, Systems Engineer (Hewlett-Packard, Fullerton, California), Technical Support Engineer, and System Performance Consultant. While working for Hewlett-Packard as a Systems Engineer, Robert taught numerous customer courses, and worked in the Santa Clara Response Center. He also taught Business Computer Systems at Santa Ana College in Santa Ana, California. He has written numerous technical articles for various Hewlett-Packard journals and magazines. Robert is the author of *Taming the HP 3000 Volumes I and II*. Currently, Robert is the president of Lund Performance Solutions, the leader in third party Hewlett-Packard HP 3000 and HP 9000 system performance software, training, and consulting. He and his wife Colleen and four daughters and son live in rural Oregon.