

PACKAGE ID - 001310IBMPC00 HINT

KWIC TITLE - Scalable Computer Performance and Analysis
(Hierarchical INTEgration)

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LIMITATION CODE -COPY **AUDIENCE CODE** - LIM

COMPLETION DATE - 01/01/1999 **PUBLICATION DATE** - 01/01/1999

DESCRIPTION - HINT is a program to measure a wide variety of scalable computer systems. It is capable of demonstrating the benefits of using more memory or processing power, and of improving communications within the system. HINT can be used for measurement of an existing system, while the associated program ANALYTIC HINT can be used to explain the measurements or as a design tool for proposed systems.

PACKAGE CONTENTS - Media Directory; Software Abstract; Media Includes Source Code, User's Guide, Executable, Auxiliary Material;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - HINT defines a simple problem of numerical integration, to be solved as accurately as possible for a given data type and memory allocation, and as quickly as possible for a given computer system. A measurement of quality is used to assess the rate of progress toward the correct result; Quality Improvements Per Second (QUIPS). When QUIPS is graphed vs. increasing memory utilization, it is possible to see the effect of slower memory access times in the various regimes of cache, main memory, and non-local memory. When QUIPS is graphed vs. increasing solution time, it is possible to see the effect of startup and communication latency. Several QUIPS graphs can be combined for a comparison of operating characteristics. In conjunction with a suite of hardware performance counters, a study of low-level memory access and instruction processing can be accomplished. ANALYTIC HINT uses a description of the computer system to predict the QUIPS graph.

COMPUTER - IBM PC

OPERATING SYSTEMS - Machine dependent

PROGRAMMING LANGUAGES - C, Fortran, Java

SOFTWARE LIMITATIONS - HINT will attempt to allocate all resources (memory, processors) for its measurements, and it should usually be the only active program in the system. The user may specify

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SOFTWARE LIMITATIONS - (CONT) limits on the allocation requests.

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - Because HINT is scalable, it can be used for a consistent measurement across the full range of computer systems, and requires only minor modifications for use with future high-performance systems.

RELATED SOFTWARE - HINT supercedes the earlier SLALOM program; it complements or replaces other benchmark programs such as LINPACK or STREAM which do not have comparable scalability. Public-domain software is used to access hardware performance counters. Graphics software is also required; most public-domain or commercial packages may be used.

OTHER PROG/OPER SYS INFO - Full source code, documentation, and Unix Make Files are included. An exclusive license for HINT and ANALYTIC HINT has been granted to Technology Labs, Inc., Clear Lake, IA, but the software remains available to U.S. Department of Energy sites.

HARDWARE REQS - Any computer system with a C compiler; multiprocessors with OpenMP or MPI communication software.

TIME REQUIREMENTS - Open-ended; the time required depends on available system memory; limits may be placed by the user.

ABSTRACT STATUS - Released AS-IS 9/24/1999.

SUBJECT CLASS CODE - P

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
H CODES
MATRICES
FORTRAN
ITERATIVE METHODS
ALGEBRA

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/ER

PACKAGE TYPE - AS - IS