

Features

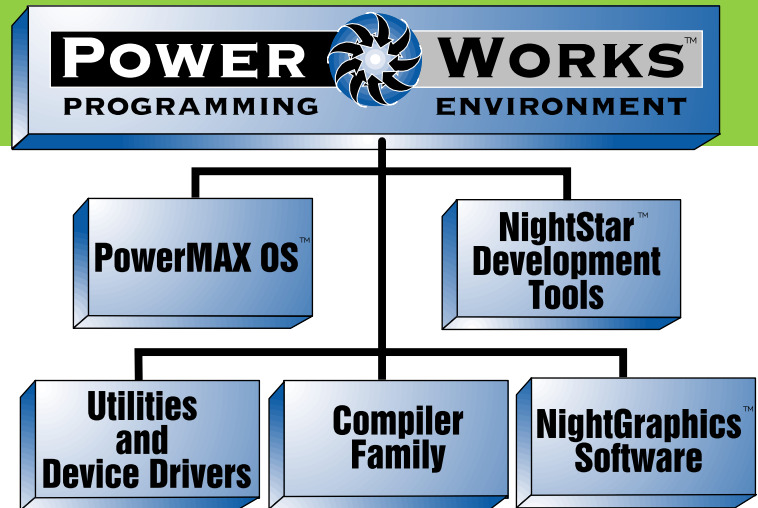
- PowerMAX OS™ - real-time UNIX®-based operating system
- Open System Standards (POSIX® 1003.1-1990, 1003.1b-1993, 1003.1c-1993, SVID Release 4, XPG4)
- Pre-emptive, multithreaded re-entrant kernel
- Tightly-coupled symmetric multiprocessing and closely-coupled multiprocessing support
- Less than 8 microsecond interrupt response time
- NightBench program development environment
- NightStar™ Development Tool Set
 - NightView™ - Debugger
 - NightTrace™ - Analyzer
 - NightSim™ - Scheduler
 - NightProbe™ - Monitor
 - NightTune™ - Tuner
- Fully optimized, industry-standard compilers developed by Concurrent (C/C++, Ada, and Fortran)
- A comprehensive set of utility and device drivers executed under PowerMAX OS
- NightGraphics™ Software

PowerPC Platforms Supported by PowerWorks

- Power Hawk™ 6U VME
- PowerStack™ PCI
- TurboHawk™ and Night Hawk® 9U VME
- PowerMAXION™ 6U VME



PowerWorks™ Development & Run-Time Environment



Overview

PowerWorks™ is Concurrent Computer Corporation's integrated real-time software development and operational environment. It is designed to facilitate the development and execution of real-time applications for a full range of systems from single processor to symmetric multiprocessing. The PowerWorks environment includes Concurrent's real-time operating system, PowerMAX OS; Concurrent's NightStar GUI-based, real-time development tools; optimized compilers for C/C++, Ada, and Fortran as well as applicable run-time libraries; and NightGraphics support software. In addition, PowerWorks supports a host of utility software and device drivers.

PowerMAX OS

PowerMAX OS is a fully preemptive, multi-threaded, UNIX-based, real-time operating system. PowerMAX OS provides high I/O throughput, fast response to external events, and efficient interprocess communication. It is completely ROMable and can be loaded from FLASH memory. An implementation of System V Release 4.2 MP (SVR4.2MP), PowerMAX OS is

compliant with POSIX standards 1003.1, 1003.1b, and 1003.1c. PowerMAX OS contains a set of real-time enhancements designed to take full advantage of underlying multiprocessor hardware architecture. The result is increased performance and determinism for real-time applications.

NightStar Development Tool Set

NightStar is a set of Motif-based software development tools that aids system builders in developing real-time applications. NightStar tools are designed to allow users to find problems early in the project life cycle and fix them faster. NightStar GUI tools significantly reduce time and labor costs throughout all phases of solution development.

NightView is a graphical, non-intrusive, source-level monitoring and debugging tool specifically designed for real-time applications. It is able to monitor and debug multiple processes running on multiple processors with minimal intrusion.

NightTrace is a graphical tool for analyzing the dynamic behavior of multiple processes simultaneously executing on multiple CPUs. The logging

Real-Time... Real Benefits

mechanism automatically combines the results into a single stream of logged data events. Kernel events such as interrupts, exceptions, context switches, system calls, and device accesses can also be logged and displayed with user application events to form a complete picture of system activities.

NightSim is a tool for building and monitoring real-time applications that require scheduled, repetitive process execution. NightSim provides a graphical user interface to PowerMAX OS's Frequency-Based Scheduler.

NightProbe provides for real-time monitoring, alerting and recording of program data in one or more executing programs with minimal intrusion.

NightTune is an interactive, graphical tuning and monitoring tool that displays multiprocessor usage by an application's tasks. NightTune increases programmer productivity by allowing dynamic process reassignment.

NightBench is a GUI that provides a common and consistent work environment for all PowerWorks development.

Compiler Family

PowerWorks includes a direct set of optimized, industry-standard compilers for C/C++, Ada, and Fortran languages. Since these compilers were developed in-house, Concurrent provides direct support thus ensuring prompt and individual customer service. PowerWorks compilers utilize a language-specific front-end along with a common back-end for code generation and optimization. Optimization is tuned for best performance on the target hardware platform.

The C/C++ compiler implements the ANSI C and C++ language standards (X3.159-1989 and X3J16/95-0185) and also supports the C language as defined in *The C Programming Language* by Kernighan and Ritchie. The compiler includes several options that provide a degree of compatibility with previous drafts of the ANSI C++ standard and USL version 3 and 2.1 C++ compilers (also known as "cfront"). The compiler utilizes Edison Design Group's C/C++ front end and produces highly optimized object code tailored to the PowerPC processor. The C/C++ standard run-time library is provided.

Concurrent's Ada development environment consists of an integrated set of software tools especially suited for the development and testing of real-time Ada 95 applications. Ada includes the Ada compiler; library management tools; automated build utilities; selected Ada bindings (POSIX.1, POSIX.5, sockets, real-time services, curses, X/Motif[™]); real-time tasking monitor; real-time tracing and data monitoring; pretty printer; static/dynamic code profiler; selective linker; and the NightView symbolic Ada debugger module.

The Fortran compiler conforms to the full language definition of the ANSI X3.9-1978 standard.

NightGraphics

NightGraphics is based on the X Window System standards that includes the application client libraries, sample clients and the X11R6 server. NightGraphics also supports Motif and OpenGL. Open GL communicates with the X server through the GLX protocol and supports both development and runtime of 2D or 3D displays depending on the capability of the target graphics hardware. The X server has been optimized to render the OpenGL commands at peak performance. The user can select to display either OpenGL or X windows or both on the same display.

Utilities and Device Drivers

PowerWorks offers a comprehensive set of utility software and device driver support. Utility software includes the standard set of UNIX tools, encryption utilities for domestic and international systems, G2 Audit module utility, Virtual Partition Software, Network File System (NFS), TCP/IP Protocols, and Fault Resilient Monitor Software.

Closely-Coupled Multiprocessing

In addition to full support for tightly-coupled PowerPC platforms, PowerMAX OS also includes powerful features for managing closely-coupled systems comprised of multiple CPU boards in a VME chassis connected by a high-performance VME or PCI bus link. Closely-coupled support includes the ability to boot multiple CPU boards from a single disk drive, shared data access over the VMEbus and/or Ethernet LAN via TCP/IP, and inter-CPU interrupts.



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