

# 200

**Filing Information**

August 2000  
IDC #  
Volume: 1  
Tab: Vendors

## Server Operating Environments and Software Platforms

### IDCFlash

#### IBM Announces AIX 5L Beta - Introducing The Next Generation of AIX

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#### IDC Opinion

*What impact will the launch of IBM's AIX 5L beta program have on the race to provide the leading operating environment for Intel's IA64?*

Intel has done its best to make sure that every major operating environment will be made available on systems built upon IA64-hardware. Windows 2000, Unix, Linux and NetWare support is planned for IA64, and will in most cases debut with IA64 hardware. The race to create the leading IA64 Unix has included as many as four entrants but is now down to only three.

Although the marathon is nearing the end, it's still not clear who the winner will be, or even whether Unix will be the preferred operating system on IA64. IBM and its partners have launched a beta program for AIX 5L Unix—the result of

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IBM/SCO/Sequent/Bull's project Monterey. HP has announced it will offer HP-UX and Sun is going to offer Solaris.

What is clear is that end users are going to have several world-class Unix operating environments from which to choose when IA64 systems become available.

### Announcement Highlights

IBM announced at LinuxWorld Expo that a beta program for Monterey, now called AIX 5L, is now underway. Project Monterey partners, which include IBM, IBM's NUMA-Q division (formerly Sequent Computers Inc.), SCO/Caldera, and Bull, have all worked together to make this software technology possible. The announcement highlights follow.

- Each of the partners contributed technology or expertise including the following.
  - IBM provided the AIX Unix kernel, system management tools and Multi-path I/O and NUMA system support from IBM DYNIX/ptx (formally Sequent DYNIX/ptx)
  - SCO provided Intel systems expertise and UNIX System V technologies from SCO UnixWare
  - Bull provided scalability and workload management expertise
- The AIX 5L Version 5 porting release for Power Architecture systems is in the hands of IBM's hardware and software partners now and the Beta 3 release for IA64 systems is expected in late 2000. AIX for RISC will run on IBM's RS/6000 server line and on Groupe Bull's POWER-based servers. It is also worth noting that AIX for IA64 will be little-endian-ordered, a reversal from the big-endian ordering of AIX 4.X on RISC.
- AIX 5L will include the following features.
  - 64-bit kernel and device drivers
  - TCP/IP enhancements offering improved network performance and reliability
  - Java 2 Version 1.3 support
  - A workload manager allowing IT managers to control

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system, storage and disk I/O utilization

- Unix SVR4 printing subsystem providing industry-standard print administration and drivers.
- A high level of Linux compatibility — many applications developed on Linux can be recompiled to run on AIX. This includes source compatibility, compliance with emerging Linux standards, and a GNU/Linux build-time environment with tools and utilities that combine to facilitate the development and deployment of Linux applications on AIX 5L. Linux affinity also includes AIX/Linux interoperability verification and will benefit customers looking to use Linux for front-end Web serving and AIX 5L for transaction and data management.
- IBM has not yet made public information on product pricing and availability.

### Snapshot Analysis

IDC watched as one operating environment supplier after another pledged to provide its software on IA64-based systems once they become available (see *IBM and SCO Form Alliance on IA32 UnixWare and IA64 AIX*, November 1998, IDC #17595, *And Then There Were Three: Compaq Drops IA64 Tru64 Unix Plans*, October 1999, IDC #20624).

Intel persuaded all of the major suppliers to join the party. At first, Sun, HP, Compaq, and IBM/SCO all promised to provide their Unix software on IA64. Compaq later dropped plans to bring Tru64 UNIX to the party, leaving Tru64 exclusively on Alpha RISC microprocessors. Microsoft promised Windows on IA64, and still says it will be ready with a 64-bit Windows 2000 in time for the IA64 launch later this year. Novell promised that NetWare would be there, too, but has not made any recent announcements about the IA64 version, originally code-named Modesto. The open source community, with the help of Intel, formed the Trillium project which promised to port Linux to IA64 as well.

IDC has seen a string of announcements that HP-UX, Solaris, Monterey, Linux, NetWare and Window have booted-up on the IA64 emulator. Several Linux suppliers have even offered developer kits for IA64-based systems. VA Linux systems, for example, allows selected developers to access prototype IA64 systems running Linux to facilitate porting and developing software.

In the beginning of this effort, the race centered on who could get Unix on IA64 first. As Linux started to become increasingly important, Linux compatibility was added to the list of required features. All of the major Unix suppliers have made announcements that their software would run Linux application

software once it had been recompiled and, in some cases, even without a recompile.

SCO and Sun announced that they had developed lxrun, an open- source compatibility layer, which would allow X86 Linux code to run on UnixWare and Solaris X86 respectively. Hewlett Packard announced HP-UX 11i, which offers API-level compatibility with Linux in both PA-RISC and IA64 versions. On the IA64 version, HP-UX 11i offers compatibility on the level of the application binary interface (ABI), making it potentially possible to run a Linux binary on Unix without a recompile.

IBM foreshadowed its plans for the eventual release of Project Monterey code and the inclusion of Linux compatibility software in September 1999, when it launched AIX 4.3.3 (see *IBM Announces AIX 4.3.3*, September 1999, IDC #20434). At that time, it wasn't clear whether this software would be named AIX, UnixWare or a new name that had yet to be announced. In the end, it appears that AIX won out, perhaps because of IBM's powerful role in the coalition to build Monterey, which included IBM acquiring Sequent and IBM providing most of the funding for the effort.

If IBM and SCO were able to get all of their current Unix customers to adopt Project Monterey, this software would have the chance to be the leading Unix operating environment for that platform. During 1999, SCO OpenServer, SCO UnixWare, and AIX collectively accounted for just over 50% of all Unix server operating environment new license shipments. But that was in the world, as it existed in CY1999.

The Intel world following the introduction of IA64 will evolve into a much different place—with Intel-based systems scaling up into the midrange price bands. In the IA32 world, the majority of the Unix/Intel volume shipments were small servers with two to four processors; a relatively small fraction were Unix/Intel midrange servers running Data General's DG-UX, Sequent's DYNIX/ptx and NCR's MP-RAS. Compaq, HP and IBM sold the majority of these high-volume 32-bit Unix/Intel servers; it is not at all clear which vendors will sell the majority of the next wave of 32-bit and 64-bit Unix/Intel server systems.

IBM has a strong position in Unix/Intel servers, both for low-end and midrange price bands, since Sequent was a leader in midrange Unix/Intel servers. If Unix/Intel proves to be a success in the IA64 world, IBM stands to reap the rewards of its earlier chess-moves as it prepared to deploy AIX on both RISC and Intel architectures. Sun, in contrast, elected to build its Solaris/IA64 to run on other vendors' computer systems, rather than on Sun servers, which are all based on SPARC/RISC architecture. HP has lined up a few partners on HP-UX for IA64, including NEC, Hitachi and Stratus, but has not added to that list of OEM partners for some time.

With this announcement, IBM has demonstrated that it has a higher level view of IA64 and Linux compatibility. It has pointed

out that very few applications are written just to a single operating environment's APIs. Most applications now are written to support an entire software "stack," including database, middleware, clustering, and other layers of software which increasingly hide the operating system. IBM, with a broad portfolio of application software that is quickly being ported to Linux, is in a strong position to leverage its strength in software in extend cross-platform compatibility between Linux and Unix.

### **Conclusion**

IBM and its partners have announced that what was launched as "Project Monterey" is prepared to "go the distance" and will result in a single operating system which will be available for systems based on IA32, IA64 and the Power Architecture. Furthermore, IBM plans to announce a number of database, middleware, development tools, and serverware products which will support applications on Unix and on Linux.

Although IBM is expected to face strong competition from both Sun and HP for IA64 Unix, it appears to have a head start. If IBM and its partner Caldera/SCO can convert their combined Unix sales into a dominant position in the IA64 Unix market, this lead could become substantial. One thing is clear, however, AIX 5L allows IBM to invoke many of the industries most powerful buzz words — such as RISC, IA64, 64-bit UNIX, 64-bit Linux, and—importantly—server-centric computing.