HP ARIES
Technical overview, references and success stories

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## IT results → Business Outcomes

<table>
<thead>
<tr>
<th>Lower Cost</th>
<th>Accelerate Growth</th>
<th>Mitigate Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reduce IT/business cost</td>
<td>- Speed time to market</td>
<td>- Minimize IT/business risk</td>
</tr>
<tr>
<td>- Improve operational efficiency</td>
<td>- Improve decision making</td>
<td>- Improve compliance</td>
</tr>
<tr>
<td>- Improve ROI</td>
<td>- Strengthen customer relationships</td>
<td>- Improve decision making</td>
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<tr>
<td></td>
<td>- Drive revenue</td>
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<td></td>
<td>- Capture market share</td>
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</tbody>
</table>
## HP Integrity technology always delivers

### Lower cost always virtualized
- Ultimate virtualization delivers 2 – 3 times server utilization rates - fewer servers for greater ROI, and lower TCO
- Energy-efficient technologies that can provide up to 50% energy savings
- Unified management tools manage your entire infrastructure as a whole – reduce staff and resource costs

### Accelerate growth always scalable
- Meet growing business needs with unmatched scalability on a standards-based platform
- Optimized performance levels for a world where every millisecond matters
- Designed to meet the unpredictable IT demands of today’s business, consistently and confidently

### Mitigate risk always available
- Business-critical, mainframe class availability and disaster tolerance, with industry-standard economics
- Range of uptime options for extreme uptime needs -- from high to continuous availability
- Integrated protection of IT resources with intelligent adaptive security
HP Integrity

• HP Integrity is the **long term** enterprise server platform
  – Improved price/performance
  – Outstanding speed & well-balanced performance with HP-UX 11i v3
• Binary compatibility for HP 9000 applications
• **HP-ux11i v3** is a **rich operating environment** with
  – Mature functionality
  – Improved performance
  – Improved virtual server environment (VSE)
  – Improved support for **multi-core** and **hyper-threading** through Logical CPU
• HP facilitates **smooth migration** through tools and services
Topics

1. Why HP Integrity?
2. ARIES objectives
3. ARIES overview
4. Upcoming solutions – MITR and XPADE
5. ARIES supportability features
6. ARIES deployment: items to consider
7. ARIES performance implications
8. ARIES options overview
9. ARIES latest releases and patches
10. ARIES robustness
11. ARIES limitations
12. ARIES support
13. ARIES testimonials, and success stories
14. ARIES: HP products supported
15. ARIES resources
16. Summary
ARIES objectives

- **Ease of migration** from HP 9000 to HP Integrity servers
- **Deliver accuracy and performance** for emulated applications
- **Reduce costs** through server consolidation
  - Support under *HP VSE* (Virtual Server Environment) solution stack
  - **PA-RISC cross development environment** for HP 9000 applications that require compilation and/or linking during installation, bring-up or runtime
- **Increase application availability** on HP-UX 11i on HP Integrity servers
  - ISV applications
    - ISV no longer exists or does not support an older version
  - In-house developed customer applications
    - Lost source code
    - Non critical applications – not good candidate for porting and optimization
  - Quickest time to solution considerations on HP Integrity servers
  - Access to same debugging tools and utilities as on HP 9000 servers
ARIES migration environment

- **ARIES dynamic binary translator is an integral part of HP-UX 11i for HP Integrity servers**
- **HP Integrity HP-UX 11i operating system support for PA-RISC executable invocation**
  - Automatic launching of ARIES upon PA-RISC executable invocation
  - Support for all flavors of HP 9000 HP-UX executables e.g. EXEC_MAGIC, SHARE_MAGIC, SHMEM_MAGIC, q3p, q4p and ELF64
- **HP 9000 HP-UX system shared libraries support on HP-UX 11i for HP Integrity servers**
  - Provides required runtime for HP 9000 HP-UX applications
  - All system shared libraries required by HP 9000 applications are delivered on HP Integrity servers
- **HP 9000 HP-UX GDB on HP-UX 11i for HP Integrity servers**
  - HP Integrity WDB/GDB package includes HP 9000 HP-UX GDB
  - On HP-UX 11i for HP Integrity servers, HP 9000 HP-UX GDB can be used to debug HP 9000 applications, core file analysis, attaching to emulated processes and memory leak detection
- **MITR : Mixed mode Translator – New!**
  - Enables HP Integrity executables to call (and be called by) HP 9000 shared libraries
  - The solution comprises of enhanced ARIES library, dynamic loader and JVM
- **XPADE : PA-RISC Cross Development Environment – New!**
  - Cross compilation and linking environment for HP 9000 HP-UX applications on HP Integrity servers
  - HP 9000 applications which require compilation and/or linking as part of installation procedure, bring-up or during runtime can be migrated to HP-UX 11i on HP Integrity servers
ARIES overview

- ARIES: Automatic Retranslation & Integrated Environment Simulation
- ARIES transparently executes 32-bit and 64-bit HP 9000 HP-UX (all versions) applications on HP-UX 11i v2 and higher (HP-UX 11i) on HP Integrity servers
- ARIES is a “dynamic binary translator with built-in environment emulation”
- ARIES is bundled with HP-UX on Integrity servers in the following form:
  - /usr/lib/hpux32/pa_boot32.so 32 bit ARIES loader
  - /usr/lib/hpux32/aries32.so 32 bit ARIES Translator
  - /usr/lib/hpux64/pa_boot64.so 64 bit ARIES loader
  - /usr/lib/hpux64/aries64.so 64 bit ARIES Translator
- ARIES is fully supported HP product
- ARIES is fully supported under HP VSE (Virtual Server Environment) solution stack on HP Integrity servers e.g. vPars, HP IVM (Integrity Virtual Machine)
ARIES overview

• Dynamic and Transparent
  – Absolutely no user intervention required to invoke ARIES
  – No re-compilation for HP 9000 applications required
• Complete, correct and reliable
  – Support for all user mode HP 9000 applications, both 32-bit and 64-bit
  – Simplicity of ARIES design has yielded high reliability
  – Emulation of all (non-privileged) PA-RISC instructions
  – Same debugging tools can be used as on HP 9000 servers
• Exact HP 9000 HP-UX - like interface
  – Bundled with the HP-UX OE, kernel support for transparency
  – Run applications on HP Integrity servers in same way as on HP 9000 servers
  – No CHROOT Jail – emulated applications have access to full file system without any special setup
• Good performance for wide range of HP 9000 applications
ARIES overview

- Quickest time to solution
  - ARIES can buy you time to pursue native port to HP-UX 11i on HP Integrity servers
- Most applications work out of the box
- OS and language runtime dependencies handled automatically
- Third party dependencies handled (not support issues though)
- Ideal for HP 9000 applications
  - Using legacy libraries that may not be ported to Integrity HP-UX servers e.g. libcma
  - Using legacy versions that may not be ported to Integrity HP-UX servers
  - Lost source code
  - ISV no longer supports or is out of business

For **ISVs**, ARIES is an **excellent** solution to have their applications available on HP Integrity servers **without making investments in source code porting**

For **customers**, ARIES is **an excellent** solution for legacy versions of application software that **may not be ported** by respective ISVs to HP Integrity servers
ARIES overview

HP 9000 HP-UX Application Binaries

HP 9000 HP-UX shell / interpreter scripts run directly on Integrity HP-UX

ARIES

Environment Emulation

System Call Manager

Control System

Exception Manager

Code Cache

ISA Emulation

Fast Interpreter

Instruction Decoder

Itanium Code Generator

Scheduler and Optimizer

Instruction Packer

Two Phase Dynamic Translator

ISA: Instruction Set Architecture

GDB Emulation

Threads Emulation

Core file Generation

Environment Emulation

Exception Manager

Control System

Code Cache

ISA Emulation

Fast Interpreter

Instruction Decoder

Itanium Code Generator

Scheduler and Optimizer

Instruction Packer

Two Phase Dynamic Translator

ARIES Loader

HP Integrity HP-UX Server

HP-UX 11i Operating System

Intel® Itanium2® CPU

ARIES setup by HP-UX OS

ARIES specific control flow

ARIES interface with HP-UX 11i on HP Integrity server

Integrity native interface
ARIES overview

Major ARIES components are

- **Loader** Starts up ARIES
- **Control system** Controls interaction among various components
- **Interpreter** High level PA-RISC instruction interpreter
- **Dynamic translator** Translates PA-RISC binary code into IA-64 code - two phase dynamic translation and optimization
- **Code cache region** Translated code buffer
- **System call manager** Handles system call interface for HP 9000 apps
- **Exception manager** Handles synchronous, asynchronous signals and creation of HP 9000 application core file.
- **Threads management** Handles creation and management of native ARIES threads on behalf of HP 9000 application threads

ARIES stores the dynamically translated code in **code cache**

Further references to translated code blocks execute directly in **code cache** and do not require additional interpretation and translation in ARIES

Translated code block targets are back-patched to ensure maximum execution in code cache
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4. **Upcoming solutions – MITR and XPADE**
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6. ARIES deployment: items to consider
7. ARIES performance implications
8. ARIES options overview
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MITR: Mixed mode Translator

MITR

Java Application

Integrity Native Binaries

Wrapper library for PA <-> IPF inter-lib calls for a few cases

JVM, DLD, ARIES

PA-RISC Native Library

IPF-PA Corefile

GDB

PA-RISC Native Library
**MITR: Mixed mode Translator**

<table>
<thead>
<tr>
<th>What</th>
<th>Enable Integrity binaries to call HP 9000 libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Q3, 2008 - for HP-UX 11i v2 (MITR for HP-UX 11i v3 will be released later) (on demand delivery model)</td>
</tr>
</tbody>
</table>
| Problem statement | ARIES does not provide flexibility of mixing Integrity native binaries and HP 9000 libraries  
The current ARIES solution is – all emulation or nothing  
- Large performance impact  
- Emulation of whole solution stack although only one non-native shared library involved  
- Java applications using JNI libraries require HP 9000 JVM to be emulated by ARIES  
- An HP 9000 only web server plug-in requires whole web server to be emulated by ARIES |
| Benefits | - Only the non-native shared library will be emulated  
- HP 9000 JNI code will not require whole JVM to be emulated by ARIES  
- Applications can harness full Integrity performance mostly running in native code |
| Solution details | - With MITR, Integrity native binaries can call (and be called by) HP 9000 libraries  
- Initially MITR solution is aimed at enabling Integrity native Java code to call HP 9000 libraries and for HP 9000 libraries to call JNI functions  
- MITR solution comprises of – enhanced JVM, ARIES, dynamic loader (**d1d**)  
- Scanner tools to certify MITR readiness of Integrity binaries and HP 9000 libraries  
- Tools to generate wrapper library for use in MTR mixed mode environment  
- Limited GDB support for ‘mixed’ core file for Integrity binaries calling HP 9000 libraries  
- MITR supports JNI interface – JVMPI and JVMDI interfaces are not supported currently  
- (**First MITR release**) non native library code will be emulated through pure interpretation |
## MITR: Mixed mode Translator

<table>
<thead>
<tr>
<th>Quality</th>
<th>Similar high quality and testing as current JVM, ARIES and DLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>- MITR solution is fully supported by HP</td>
</tr>
<tr>
<td></td>
<td>- Contact HP Response Center (<a href="http://www.itrc.hp.com">HP ITRC</a>) for technical support</td>
</tr>
<tr>
<td>Limitations / exceptions</td>
<td>- Not as transparent a solution as pure ARIES emulation</td>
</tr>
<tr>
<td></td>
<td>- May require a wrapper library for function prototypes for PA-RISC ↔ IPF C calls</td>
</tr>
<tr>
<td></td>
<td>- Installation of non-native library may require copying it over from HP 9000 server</td>
</tr>
<tr>
<td></td>
<td>- No support yet for calling Integrity native libraries from HP 9000 binaries</td>
</tr>
<tr>
<td></td>
<td>- No support for <code>setjmp/longjmp</code> calls in HP 9000 libraries or Integrity native binaries</td>
</tr>
<tr>
<td></td>
<td>- No support for context examination (including modification) and thread operations in HP 9000 libraries and Integrity native binaries</td>
</tr>
<tr>
<td></td>
<td>- No support for C++ code in HP 9000 shared libraries</td>
</tr>
<tr>
<td></td>
<td>- (<a href="#">First MITR release</a>) No support for making system calls using assembly stubs – HP 9000 libraries must use standard libc interfaces for making system calls. Future MITR releases may provide enhancements to handle system calls made by HP 9000 libraries using assembly stubs</td>
</tr>
<tr>
<td></td>
<td>- HP 9000 libraries must follow standard PA-RISC runtime and procedure calling conventions</td>
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<tr>
<td></td>
<td>- No support for handling of synchronous exceptions in HP 9000 libraries - the native signal handler cannot examine and modify PA-RISC register context relevant to HP 9000 shared library code</td>
</tr>
<tr>
<td></td>
<td>- No support for delayed floating point exception delivery in HP 9000 library code</td>
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</table>
XPADE: PA-RISC Cross Development Environment

HP-UX 11i on HP Integrity Server
## XPADE: PA-RISC Cross Development Environment

<table>
<thead>
<tr>
<th>What</th>
<th>PA-RISC Cross Development Environment on HP-UX 11i v2 and v3 for HP Integrity servers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Availability</strong></td>
<td>Q3, 2008 <em>(first phase release – on demand delivery model)</em></td>
</tr>
</tbody>
</table>
| **Benefits** | - HP 9000 applications which require compilation and/or linking as part of installation, bring up or runtime can be migrated to HP Integrity servers using ARIES  
- Customer don’t need to copy header files, libraries, utilities from HP 9000 servers to HP Integrity servers for cross compilation and/or linking  
- Self contained single installable depot – easy to install, setup and use  
- XPADE solution is **fully tested and supported** by HP  
- Similar high quality and testing as current releases on HP 9000 HP-UX servers  
- XPADE can co-exist with Integrity native C/aC++ Developer’s Bundle on same Integrity server |
| **Solution details** | - The solution comprises of – HP 9000 C/aC++ compiler, debugger, linker, linker tools, header files from `/usr/include` and libraries from `/usr/lib` and `/usr/lib/pa20_64` directories  
- HP 9000 linker (and tools), and debugger already shipping on HP Integrity servers under `/usr/ccs/pa` directory – XPADE will provide linker tools that are not shipping on Integrity servers  
- Separate installable depots for HP-UX 11i v2 and v3 (ftp access, DVD)  
- HP-UX 11i v2/v3 XPADE depots must be installed on HP-UX 11i v2/v3 Integrity servers only – and will generate HP-UX 11i v2/v3 objects (*)  
- Pre-built objects (*) from same HP-UX 11i version on HP 9000 servers can be used under XPADE  
- XPADE generated objects (*) can be identified using ‘what’ string or ‘odump –comp’ command for executables/libraries and object files respectively and will show compiler version as ‘X.03.80’  
- Third party header files and libraries must be installed under XPADE installation root directory  
* object files, libraries and executables |
## XPADE: PA-RISC Cross Development Environment

### Usage
- Install the XPADE depot
  ```bash
  swinstall -s <full_path_to_XPADE_depot>
  ```
- Set `SDKROOT` and `TARGETROOT` environment variables to **XPADE installation directory**
  ```bash
  export SDKROOT=/opt/XPADE/v3
  export TARGETROOT=/opt/XPADE/v3
  ```

### Support
- **XPADE is a licensed product/solution**
- XPADE is a fully supported HP product/solution
- XPADE support life is same as that of C/aC++ Developer’s Bundle on HP 9000
- Contact HP Response Center (HP ITRC – [http://www.itrc.hp.com](http://www.itrc.hp.com)) for tech. support

### Limitations / exceptions
- **XPADE is not a general replacement** for PA-RISC development environment
- **(First XPADE release)** XPADE generated executables, libraries and object files must be used under ARIES – building under XPADE and deployment on HP 9000 servers is not supported
- Build time under XPADE may increase by up to 2x compared to HP 9000 servers
- Make files may require modifications
- No cross development between HP-UX 11i v2 and v3
- No support for development environments prior to HP-UX 11i v2 (11.23)
- No support for `-G/-p` options (PBO builds not supported)
- No support for tools which have already been deprecated on HP 9000 servers
- No support for mixing of HP 9000 and HP Integrity object code
- No support for static linking of executables and libraries if the link target depends on archive versions system libraries from `/usr/lib` or `/usr/lib/pa20_64`
## XPADE:
### PA-RISC Cross Development Environment

**XPADE will not deliver following:**

- Archive libraries except `milli.a` (32-bit and 64-bit)
- **(First XPADE release)** Utilities from `/bin`, `/usr/bin` directories from HP 9000 servers
- `make` command from HP 9000 servers
- Non libraries files and directories under `/usr/lib` and `/usr/lib/pa20_64` directories from HP 9000 servers
- Symbolic links that point to
  - Original files outside XPADE installation root
  - Original files not present on the server
- ISU components of header files and libraries on HP 9000 servers
- Manual pages for the system header files and libraries
- Transition links (`tlink`) database
- F90 compiler
- `lex` and `yacc` tools and corresponding libraries
# ARIES supportability features

<table>
<thead>
<tr>
<th>Why</th>
<th>What</th>
</tr>
</thead>
</table>
| • Quick and easy diagnosis of application faults  
  – application crashes  
  – core-dumps  
  – incorrect behaviour  
  – hangs  
• Identification of ARIES faults leading to application failures | • Core file of the HP 9000 application in case of an application failure  
• Debugging the HP 9000 application using the HP 9000 GDB where both run under ARIES  
• Attaching HP 9000 GDB to an already running emulated process  
• Memory leak detection of HP 9000 application under ARIES using HP GDB  
• Using HP 9000 system call tracer `tusc` to monitor application’s system calls and signals |

**ARIES supportability features simplify HP 9000 applications support on Integrity HP-UX servers**

Customers deploying HP 9000 applications on HP-UX 11i on HP Integrity servers under ARIES will have access to same debugging tools and utilities as on HP 9000 servers.
ARIES supportability features

Core File of HP 9000 applications

- ARIES writes a core file ‘core.<application_name>’ in the same cases as when the application would have generated ‘core’ when running on an HP 9000 server.
- The file format of the core dump is same as that produced on HP 9000 servers i.e. SOM for 32-bit executables and ELF for 64-bit executables.
- The core file produced by ARIES may be used for failure analysis on a HP 9000 server or on an Integrity HP-UX server using the HP 9000 GDB (running under ARIES).
- To debug the ARIES generated HP 9000 application core file on a different server, refer to GDB help on `packcore` command.
- ARIES follows all standard HP–UX conventions for generation of HP 9000 application core file.
- On HP-UX 11i v3, core file pattern can be changed by `coreadm(2)` system call and `coreadm(1M)` command.

- Usage: `gdb a.out core.a.out`
- For more details refer to `aries(5)` man page.
ARIES supportability features

Debugging HP 9000 applications on Integrity HP-UX servers

- HP 9000 applications can be debugged with GDB on Integrity HP-UX servers in ARIES mode
- No change in GDB user interface (including WDB GUI)
- Negligible loss of performance in interactive mode
- The HP 9000 GDB is included by default as part of the Integrity HP-UX WDB package
- All GDB commands work just like they would on an HP 9000 server
- ARIES does not support debugging of HP 9000 MxN applications. Such applications can be debugged in traditional 1x1 model
- GDB can be attached to an already running emulated process under ARIES

• For more details refer to aries(5) man page
ARIES supportability features

Memory Leak detection of HP 9000 applications

- Applications cannot leak memory under ARIES unless they do so on HP 9000 servers
- HP GDB can be used to detect memory leaks of HP 9000 applications under ARIES
- Refer to HP GDB documentation for more details
ARIES supportability features

Tracing HP 9000 application system calls / signals

- HP 9000 system call tracer `tusc` can be used to trace HP 9000 applications
- Both command line start up and attach modes are supported
- Integrity HP-UX native `tusc` is not useful to monitor HP 9000 application’s system calls as some system calls are returned from within ARIES

• Usage:
  - `export PA_DEBUG=1`
  - `tusc <args> <path_to_PA-RISC_executable> <app_args>`
  - `tusc <args> <PID_of_PA-RISC_process>`

• Limitation:
  - Only one level of parent/child processes can be traced i.e. if child process calls `fork()` – the child’s child process cannot be traced under current implementation of emulated process tracing under ARIES
ARIES: when and where to use

<table>
<thead>
<tr>
<th>Go for ARIES emulation</th>
<th>Go for native port</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARIES – is a <strong>recommended solution</strong> for:</td>
<td><strong>ARIES – is not a recommended solution</strong> for:</td>
</tr>
<tr>
<td>• Application porting difficult</td>
<td>• You want to harness full power of Integrity servers by native optimizations and HP-UX 11i APIs</td>
</tr>
<tr>
<td>• No access to source code</td>
<td>• Concerns around emulated applications performance and behavior</td>
</tr>
<tr>
<td>• Quickest time to solution is critical</td>
<td>• ISV refuses to offer application support under ARIES</td>
</tr>
<tr>
<td>• Well behaved applications</td>
<td>• Known performance concerns</td>
</tr>
<tr>
<td>• Maximum performance not a concern</td>
<td>- Floating point intensive application</td>
</tr>
<tr>
<td>• Application dependencies not available native on HP-UX 11i on Integrity servers</td>
<td>- Short running Java applications</td>
</tr>
<tr>
<td>• In-house developed customer applications</td>
<td>- Process memory footprint critical</td>
</tr>
<tr>
<td>ARIES – is the <strong>only solution</strong> for:</td>
<td>- Process start up time critical</td>
</tr>
<tr>
<td>• Lost source code</td>
<td>- High availability / mission critical environment</td>
</tr>
<tr>
<td>• Legacy application versions</td>
<td>- Typical linear code e.g. parsers, interpreters, shells</td>
</tr>
<tr>
<td>• Application depends on legacy libraries</td>
<td><strong>ADVICE:</strong> Use Integrity HP-UX native port of these applications</td>
</tr>
<tr>
<td>• Third party dependencies do not plan to port to HP-UX 11i on Integrity servers</td>
<td></td>
</tr>
</tbody>
</table>
ARIES : when and where to use

• In general, ARIES is a good fit for user space application migration from old HP 9000 servers where solution stack comprises of application versions that are not available natively on HP-UX 11i on HP Integrity servers

• No special expertise is required to deploy applications in ARIES mode on HP Integrity servers
  – Copy/install/NFS-mount/attach-storage application installation from HP 9000 to HP Integrity servers
  – Execute the applications as on HP 9000 servers

• For any support and consultation for migration of applications from HP 9000 servers to HP-UX 11i on HP Integrity servers,
  – Contact your HP account manager, or
  – Contact HP DSPP (http://www.hp.com/go/dspp)
  – Contact HP support organization (HP ITRC – http://www.itrc.hp.com)
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8. ARIES options overview
9. ARIES latest releases and patches
10. ARIES robustness
11. ARIES limitations
12. ARIES support
13. ARIES testimonials, and success stories
14. ARIES: HP products supported
15. ARIES resources
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ARIES performance implications

<table>
<thead>
<tr>
<th>ARIES performance – good</th>
<th>ARIES performance – not good</th>
</tr>
</thead>
<tbody>
<tr>
<td>• I/O intensive or Interactive applications</td>
<td>• Floating point intensive applications</td>
</tr>
<tr>
<td>• Loop intensive, integer compute based application with good locality of execution</td>
<td>• Java based short running applications</td>
</tr>
<tr>
<td>• Static rendering graphics applications (without animations)</td>
<td>• Multi-threaded applications that create lot of threads and spend significant amount of time in thread synchronization operations</td>
</tr>
<tr>
<td>• Memory intensive applications</td>
<td>• Applications compiled with <code>+Ovolatile</code> compiler option</td>
</tr>
<tr>
<td>• Database clients</td>
<td>• OpenGL based applications may work with good performance if they can use display lists and can communicate with OpenGL daemon process using GLX protocol</td>
</tr>
<tr>
<td>• OLTP applications – require extensive testing before deployment to ensure all critical parameters are within limits</td>
<td>• Transaction processing application comprising several hundred processes</td>
</tr>
<tr>
<td>• Applications migrated from K/L/N class HP 9000 servers</td>
<td>• Typical linear code e.g. parsers, shells, interpreters (PERL)</td>
</tr>
</tbody>
</table>

**ADVICE:** Use Integrity HP-UX native ports of these applications

On HP Integrity servers HP 9000 applications will benefit from faster CPU, server architecture and optimized ARIES.
ARIES performance

Server configurations for ARIES performance comparison

<table>
<thead>
<tr>
<th>Server model</th>
<th>HP-UX OS</th>
<th>CPU</th>
<th>CPU clock</th>
<th>CPU/Core</th>
<th>L0 ICache</th>
<th>L0 DCache</th>
<th>L1 Cache</th>
<th>L2 Cache</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2000-44 / rp5450</td>
<td>11i v2 (11.23)</td>
<td>PA8500 Rev 2.4</td>
<td>440 MHz</td>
<td>4</td>
<td>512 KB</td>
<td>1024 KB</td>
<td>NA</td>
<td>NA</td>
<td>2 GB</td>
</tr>
<tr>
<td>L3000-8x / rp5470</td>
<td>11i v1 (11.11)</td>
<td>PA8700 Rev 3.1</td>
<td>750 MHz</td>
<td>4</td>
<td>768 KB</td>
<td>1536 KB</td>
<td>NA</td>
<td>NA</td>
<td>4 GB</td>
</tr>
<tr>
<td>rp4440</td>
<td>11i v3 (11.31)</td>
<td>PA8900 Rev 3.2</td>
<td>1000 MHz</td>
<td>2 P : 4 C</td>
<td>768 KB</td>
<td>768 KB</td>
<td>64 MB</td>
<td>NA</td>
<td>16 GB</td>
</tr>
<tr>
<td>Rx2660</td>
<td>11i v3 (11.31)</td>
<td>Montvale 9100</td>
<td>1.67 GHz</td>
<td>2 P : 4 C</td>
<td>16 KB</td>
<td>16 KB</td>
<td>1024 : 256 KB</td>
<td>9 MB/C</td>
<td>16 GB</td>
</tr>
</tbody>
</table>

- Differences in server memory is of lesser significance for the performance comparison as none of the selected benchmarks consume more than 1 GB memory.
- ARIES performance on HP Integrity server is considered as reference = 1
  - Different HP 9000 server performance is compared with ARIES reference performance
  - For example, 0.39 for PA8500 for SPEC CPU INT2000 indicates 61% ARIES mode performance benefit compared to native execution on HP 9000 server
  - In the graphs, all points below reference green line indicate ARIES mode performance gain
  - In the graphs, all points above reference green line indicate ARIES mode slowdown

ARIES Patch: PHSS_36520 for HP-UX 11i v3 (11.31)

HP 9000 server

HP Integrity Server
ARIES performance

- **ARIES performance comparison on Madison 6M and Montvale 9100 18M**
- Y axis represents relative HP 9000 server performance compared to ARIES reference performance = 1

ARIES on Montvale 9100 18M 1.67 GHz rx2660
Integrity server compared to HP 9000 servers

ARIES mode performance is better or comparable for all but the fastest (PA8900 based) HP 9000 servers
ARIES performance

- ARIES performance comparison on Madison 6M/Montvale 9100 18M for SPEC CPU INT2000
- Y axis represents relative HP 9000 server performance compared to ARIES reference performance = 1
- Dotted lines represent **weighted average** in following graphs

---

ARIES on Montvale 9100 18M 1.67 GHz rx2660
Integrity server compared to HP 9000 servers

ARIES mode performance is better or comparable for all but the fastest (PA8900 based) HP 9000 servers
ARIES performance

- ARIES performance comparison on Madison 6M/Montvale 9100 18M for SPEC CPU FP2000
- Y axis represents relative HP 9000 server performance compared to ARIES reference performance = 1
- Dotted lines represent **weighted average** in following graphs

ARIES mode performance is better or comparable for all but the fastest (PA8900 based) HP 9000 servers
ARIES performance

- ARIES performance comparison on Madison 6M/Montvale 9100 18M for Sysbench-0.4.8
- Y axis represents relative HP 9000 server performance compared to ARIES reference performance = 1
- Dotted lines represent average in following graphs

Benchmark Parameters
- num_threads 1 (ST)
- num_threads 32 (MT)
- memory_block_size 4 KB
- memory_total_size 500 MB
- memory_scope global
- memory_operation read/write
- file_test_mode rndrw
- file_num 10
- file_total_size 500 MB
- cpu_max_prime 10000
- thread_stack_size 128 KB
- thread_yields 1000
- thread_locks 16
- mutex_num 4096
- mutex_locks 50000
- mutex_loop 10000

ARIES on Montvale 9100 18M 1.67 GHz rx2660
Integrity server compared to HP 9000 servers

ARIES mode performance is better or comparable for all but the fastest (PA8900 based) HP 9000 servers
ARIES performance

• Summary of ARIES performance comparisons from previous graphs
  - On Montvale 9100 18 MB L3 cache 1.67 GHz based rx2660 HP Integrity server ARIES performance is (on an average)
    • For CPU intensive workloads
      - ~2x FASTER vs. PA8500 440 MHz based rp5450 HP 9000 server
      - ~25% FASTER vs. PA8700 750 MHz based rp5470 HP 9000 server
      - ~25% SLOWER vs. PA8900 1000 MHz based rp4440 HP 9000 server
    • For non-CPU intensive workloads - varies largely depending on test type and server configuration and could range between 0.5x – 4x of the HP 9000 server performance
  • ARIES mode performance of your application will vary depending on execution profile and could be comparable or better than HP 9000 server (PA8700 750 MHz or older) performance
  • ARIES mode performance gain also depends on configuration of HP 9000 and target HP Integrity servers

HP ARIES technology on current Integrity servers provides performance better than PA8500, equivalent to PA8700, and nearly 75% of the latest PA8900 based HP 9000 servers. As a result, HP Integrity servers can be an ideal platform for hosting legacy HP 9000 application workloads as a part of your transformation to HP Integrity servers.
### ARIES performance highlights with ISV/customer applications:

<table>
<thead>
<tr>
<th>When</th>
<th>Application</th>
<th>HP 9000 Server</th>
<th>HP Integrity Server</th>
<th>ARIES Patch</th>
<th>ARIES mode performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Applications from a Telecom major in APJ</td>
<td>PA8700 750 MHz</td>
<td>Madison 6M 1500 MHz</td>
<td>11.23 PHSS_30779</td>
<td>150% of PA8700</td>
</tr>
<tr>
<td>2005</td>
<td>An e-business/BI application</td>
<td>PA8800 900 MHz</td>
<td>Madison 9M 1600 MHz</td>
<td>11.23 PHSS_34201</td>
<td>65% of PA8800</td>
</tr>
<tr>
<td>2005</td>
<td>Applications from a Telecom major in EMEA</td>
<td>PA8800 900 MHz</td>
<td>Madison 9M 1600 MHz</td>
<td>11.23 PHSS_34201</td>
<td>110% of PA8800</td>
</tr>
<tr>
<td>2006</td>
<td>HP Radia application components</td>
<td>PA8800 1000 MHz</td>
<td>Madison 3M 1600 MHz</td>
<td>11.23 PHSS_34201</td>
<td>57% of PA8800</td>
</tr>
<tr>
<td>2007</td>
<td>Data cleansing application</td>
<td>PA8900 1000 MHz</td>
<td>Madison 9M 1600 MHz</td>
<td>11.23 PHSS_35045</td>
<td>120% of PA8900 (with <code>sched_trace</code> ARIES option)</td>
</tr>
<tr>
<td>2007</td>
<td>A BI application</td>
<td>PA8800 800 MHz</td>
<td>Madison 3M 1300 MHz</td>
<td>11.23 PHSS_36519</td>
<td>68% of PA8800</td>
</tr>
<tr>
<td>2007</td>
<td>An ERP application</td>
<td>PA8900 1000 MHz</td>
<td>Madison 9M 1600 MHz</td>
<td>11.31 PHSS_36520</td>
<td>85% of PA8900 55% of Integrity native</td>
</tr>
<tr>
<td>2007</td>
<td>Report generation and forms conversion app.</td>
<td>PA8800 800 MHz</td>
<td>Madison 3M 1300 MHz</td>
<td>11.23 PHSS_36519</td>
<td>50% of PA8800</td>
</tr>
</tbody>
</table>
ARIES options overview

• ARIES options are useful for advanced users who want to control
  – ARIES optimizations
  – ARIES memory configuration
  – ARIES performance tuning

• Options to ARIES are specified through resource configuration (RC) file:
  – .ariesrc for 32-bit ARIES
  – .aries64rc for 64-bit ARIES

• ARIES RC file can be placed in one of following locations:
  – System root directory (/)
  – Application directories making up the path to HP 9000 executable
  – User’s home directory ($HOME)

• ARIES RC file format
  – ARIES RC file format is - application-full-path followed by ARIES options
  – Application-full-path can have wild-cards ‘*’ in directory and application name parts

• Refer to aries(5) man page for detailed information on ARIES RC file format and ARIES options
ARIES options overview

Available ARIES options and allowed values:

<table>
<thead>
<tr>
<th>ARIES Option</th>
<th>Option Type</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>-[no]amap_smc</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>-[no]backpatch</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>-[no]breaker</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]compt_core</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>-[no]corepid</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]fpsr_trans</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]help</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]mem_min</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]mem_fence</td>
<td>ON OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]mem_order</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]ot_fprgr</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>-[no]opt_reorder</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]pa_os_cpu</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]sched_trace</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-[no]trans</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>-[no]unsafetrans</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-amapsz</td>
<td>uint32_t</td>
<td>8192 KB</td>
<td>65536 KB</td>
<td>16384 KB</td>
</tr>
<tr>
<td>-amapsz_smc</td>
<td>uint32_t</td>
<td>512 KB</td>
<td>4096 KB</td>
<td>2048 KB</td>
</tr>
<tr>
<td>-ap_heap_ssz</td>
<td>uint32_t</td>
<td>1024 KB</td>
<td>variable</td>
<td>4096 KB</td>
</tr>
<tr>
<td>-aries_bssz</td>
<td>uint32_t</td>
<td>48 KB</td>
<td>64 KB</td>
<td>48 KB</td>
</tr>
<tr>
<td>-aries_ssz</td>
<td>uint32_t</td>
<td>128 KB</td>
<td>256 KB</td>
<td>160 KB</td>
</tr>
<tr>
<td>-ccsz</td>
<td>uint32_t</td>
<td>4096 KB</td>
<td>65536 KB</td>
<td>16384 KB</td>
</tr>
<tr>
<td>-core_format</td>
<td>char *</td>
<td>v1</td>
<td>v2</td>
<td>v2</td>
</tr>
<tr>
<td>-descsz</td>
<td>uint32_t</td>
<td>4096 KB</td>
<td>32768 KB</td>
<td>8192 KB</td>
</tr>
<tr>
<td>-exc_dynet_heap_ssz</td>
<td>uint32_t</td>
<td>5120 KB</td>
<td>8192 KB</td>
<td>5120 KB</td>
</tr>
<tr>
<td>-heap_ssz</td>
<td>uint32_t</td>
<td>8196 KB</td>
<td>variable</td>
<td>22528 KB</td>
</tr>
<tr>
<td>-issz</td>
<td>uint32_t</td>
<td>32 KB</td>
<td>-ssz value</td>
<td>64 KB</td>
</tr>
<tr>
<td>-load</td>
<td>char *</td>
<td>-</td>
<td>-</td>
<td>NULL</td>
</tr>
<tr>
<td>-nomore</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-osinc</td>
<td>uint32_t</td>
<td>4 KB</td>
<td>1024 KB</td>
<td>64 KB</td>
</tr>
<tr>
<td>-reset_all</td>
<td>ON/OFF flag</td>
<td>-</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>-save</td>
<td>char *</td>
<td>-</td>
<td>-</td>
<td>NULL</td>
</tr>
<tr>
<td>-ssz</td>
<td>uint32_t</td>
<td>256 KB</td>
<td>392192 KB</td>
<td>8192 KB</td>
</tr>
<tr>
<td>-ts</td>
<td>uint32_t</td>
<td>0 UINT32_MAX</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>-ts_trace</td>
<td>uint32_t</td>
<td>0 UINT32_MAX</td>
<td>1024</td>
<td></td>
</tr>
</tbody>
</table>

- ARIES option values shown on the left are for 32-bit ARIES
- These values are obtained with -help ARIES option in ARIES RC file
- Similarly 64-bit ARIES option value ranges can be obtained by passing -help ARIES option in ARIES RC file
- When -help ARIES option is specified in ARIES RC file, the process will exit after printing the help menu
- Some of the ARIES options mentioned in this presentation are available in ARIES starting from patches:
  - PHSS_36519 (11.23/HP-UX 11i v2)
  - PHSS_36520 (11.31/HP-UX 11i v3)
ARIES latest releases and patches

**ARIES product**

<table>
<thead>
<tr>
<th>Release</th>
<th>Current Patch</th>
<th>Released</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.23</td>
<td>PHSS_36519</td>
<td>Nov 28, 2007</td>
<td>Perf + defect fixes</td>
</tr>
<tr>
<td>11.31</td>
<td>PHSS_36520</td>
<td>Nov 28, 2007</td>
<td>Perf + defect fixes</td>
</tr>
</tbody>
</table>

**ARIES man page**

<table>
<thead>
<tr>
<th>Release</th>
<th>Current Patch</th>
<th>Released</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.23</td>
<td>PHCO_36445</td>
<td>Dec 02, 2007</td>
<td>English</td>
</tr>
<tr>
<td>11.31</td>
<td>PHCO_36447</td>
<td>Dec 02, 2007</td>
<td>English</td>
</tr>
<tr>
<td>11.23</td>
<td>PHCO_36446</td>
<td>March 28, 2008</td>
<td>Japanese</td>
</tr>
<tr>
<td>11.31</td>
<td>PHCO_36448</td>
<td>March 28, 2008</td>
<td>Japanese</td>
</tr>
</tbody>
</table>

- 11.23 $\leftrightarrow$ HP-UX 11i v2
- 11.31 $\leftrightarrow$ HP-UX 11i v3

- Released ARIES patches can be downloaded from [http://www.itrc.hp.com](http://www.itrc.hp.com)
- ARIES patches are also delivered as part of HP-UX OE update & QPK releases
ARIES robustness

• More than 6 years of field experience (first ARIES release during 2001)
• Many customers and ISVs have adopted ARIES as quick and easy migration path to Integrity HP-UX servers
• ARIES based deployments include:
  – Database applications
  – Application servers
  – Web Servers
  – Telecommunication Applications
  – On line application and services management
  – Graphics/CAD/CAE applications
  – Engineering Applications
  – System/Enterprise manageability solutions
  – Storage solutions applications
  – Transaction processing applications
ARIES robustness

- **For ISA (Instruction Set Architecture) Emulation Testing**
  - Random instruction set generator
  - Some of the tests used for PA-RISC processor verification

- **For Environment Emulation**
  - Interaction with the HP-UX kernel teams
  - Using HP-UX kernel sources to model ARIES environment emulation
  - Testing with HP 9000 HP-UX system shared libraries test suites.
  - Libc `malloc()` tests
  - Some of the tests used for HP-UX verification
  - Several hundred ARIES functional tests

- **Application testing**
  - Web browser and web servers
  - Text editors
  - PDF Tool Kit (PDKTK)
  - HP 9000 C and aC++ tests
  - PERL 5.8.3 test harness
  - Bash 3.0 test harness

- **Performance testing**
  - Spec CPU2000 and Spec CPU2006 INT and FP
  - Spec JVM98 with PA-RISC HP-UX JVM 1.4 and 1.5
  - Spec JBB2000 and Spec JBB2005 with PA-RISC HP-UX JVM 1.4 and 1.5
  - System performance benchmark

How ARIES delivers ARIES quality, reliability & performance
ARIES limitations

- **All HP 9000 user mode applications** will work fine under ARIES with following exceptions:
  - Calling of Integrity shared libraries by HP 9000 applications, is currently not supported
  - No support for very old HP-UX applications that use page size lower than 4 KB
  - No support for privileged PA-RISC instructions – thus HP 9000 kernel modules are not supported, such applications use system calls `modload()`, `moduload()`, `modpath()`, `getksym()`, `modadm()` and `modstat()`
  - Applications that are sensitive to timing of code execution paths may experience incorrect behaviour under ARIES (such applications are not portable anyway)
  - Applications that use `profil()` or `ptrace()` system calls, are not supported
  - Since ARIES consumes a small amount of process’s address space, applications that are maxed out on their data segment virtual address space usage, are not supported
  - Applications that rely on differences of `fork()` and `vfork()` system calls, are not supported
  - ARIES emulates MxN threads as traditional 1x1 threads without any impact on application functionality and correctness
ARIES limitations

- Applications that use memory management related system calls e.g. `mmap()`, `mprotect()` etc, and assume the system page size to be always 4 KB, may not work correctly on HP-UX 11i v3 under ARIES, if the system base page size is set to a higher value (8 KB, 16 KB, 32 KB, 64 KB)

**NOTE:**

- ARIES supports HP 9000 applications on HP-UX 11i on HP Integrity servers that run correctly on the same HP-UX version on HP 9000 servers, whether the application was built on that version of HP-UX or a prior version and supported by virtue of the HP-UX binary compatibility statement
| 1 | Why HP Integrity? |
| 2 | ARIES objectives |
| 3 | ARIES overview |
| 4 | Upcoming solutions – MITR and XPADE |
| 5 | ARIES supportability features |
| 6 | ARIES deployment: items to consider |
| 7 | ARIES performance implications |
| 8 | ARIES options overview |
| 9 | ARIES latest releases and patches |
| 10 | ARIES robustness |
| 11 | ARIES limitations |
| 12 | **ARIES support** |
| 13 | ARIES testimonials, and success stories |
| 14 | ARIES: HP products supported |
| 15 | ARIES resources |
| 16 | Summary |
ARIES support

• ARIES binary compatibility support document:

• **ARIES** is a dynamic binary translator that provides binary compatibility* for applications (32-bit and 64-bit) that were built on HP-UX (all versions) on HP 9000 servers to run unmodified on all versions of HP-UX 11i on HP Integrity servers. The use of ARIES is completely transparent. ARIES is shipped free of charge as part of the operating environment (OE) on all versions of HP-UX 11i running on HP Integrity servers.

• ARIES supports HP 9000 applications on HP Integrity servers that run correctly on the same HP-UX version on HP 9000 servers, whether the application was built on that version of HP-UX or a prior version and, supported by virtue of the HP-UX binary compatibility statement.

• HP is committed to investment protection for its customers, partners and ISVs. HP assures support and bug fixes for ARIES so that existing HP 9000 applications can behave the same on HP Integrity servers as they did on HP 9000 servers**
ARIES support

• Any issue encountered during application runtime using ARIES may be attributed to ARIES or the application itself
  – If the problem is not encountered on an HP 9000 server, for reporting compatibility failure issues and technical support on ARIES HP recommends following support options –
    • HP support contact dedicated for your account
    • HP IT Response Center (ITRC)
    • Support line (for North America) at 1-800-249-3294, use option 2
    • Alternatively help is available by sending an e-mail to dspp.dev@hp.com

While reporting ARIES related issues classify the problem as “ARIES compatibility failure”. Note that a support contract for HP-UX 11i operating environment (OE) for HP Integrity servers is required to avail HP technical support on ARIES

– Otherwise, for product support related to HP 9000 ISV applications that are deployed under ARIES, HP recommends contacting the respective application vendor(s) for resolution

* ARIES limitations
** All user space applications subjected to ARIES limitations
ARIES support

- Regardless of which HP 9000 HP-UX version the application was compiled on, ARIES will run the application under the current HP-UX OS version. Older applications rely on forward binary compatibility provided by HP-UX
  - On Integrity HP-UX 11.23 (11i v2) ARIES will run all HP 9000 applications in HP-UX 11.23 mode
  - On Integrity HP-UX 11.31 (11i v3) ARIES will run all HP 9000 applications in HP-UX 11.31 mode

- For more information
  - HP ARIES Dynamic Binary Translator
    http://www.hp.com/go/aries
  - ARIES Binary Compatibility and Product Support Statement
  - HP-UX 11i compatibility for HP Integrity and HP 9000 servers
  - HP-UX 11i – Value leadership for enterprise UNIX®
    http://www.hp.com/go/hpux11i
  - HP Integrity servers
    http://www.hp.com/go/integrity
ARIES support

- No separate support contract is required for HP technical support on ARIES. ARIES support is included in HP-UX 11i OE support contract.
- For HP 9000 applications deployed under ARIES on HP-UX 11i on HP Integrity servers:
  - HP support is for ARIES product only
  - HP support includes consultation for installation issues, resolution of ARIES issues resulting in HP 9000 application failures and triaging of performance issues
  - For triaging of issues if necessary the user may be required to demonstrate that the issue does not reproduce on an HP 9000 server
- For installation of HP 9000 applications or patches on Integrity HP-UX servers, following option need to be passed to `swinstall` and `swconfig` commands:
  - `-x allow_incompatible=true`
  - This advisory is not applicable to dual-architecture (PA + Integrity) products and patches
ARIES and software security

Software Security in ARIES emulation environment

- ARIES is as secure as the HP 9000 application itself
- ARIES runs in user space with user credentials
- ARIES and emulation application memory regions are separate
- For each invocation of HP 9000 application a separate ARIES instance gets invoked
- ARIES discards all dynamic translations after the emulated process exits
- ARIES does not create or overwrite temporary files (including diagnostics) if the emulated HP 9000 application is setuid or setgid
ARIES and virtualization environment

ARIES under virtualization environment

- ARIES is fully supported under HP VSE (Virtual Server Environment) solution stack
  - Hard Partitions – nPars
  - HP Virtual Partitions – vPars
  - HP Integrity Virtual Machines – HP IVM
  - HP Process Resource Manager/pSets
- Ideal for consolidation of several HP 9000 servers to virtual partitions or virtual machine guests on HP Integrity servers
- For information on HP VSE on HP-UX 11i for HP Integrity servers, refer to
  - http://www.hp.com/go/vse
ARIES support -- troubleshooting

• Just because the application failed when migrated under ARIES, it may not always be an ARIES fault
  – Check the application error/diagnostic logs
  – All ARIES error/warning/diagnostic messages begin with [HP ARIES32/64]:
  – Check for missing shared libraries or ones with wrong file permissions
  – Check for the latest patch levels of shared libraries that the application depends on
  – Trace the application with HP-UX system call tracer tusc
  – Use HP GDB to get application failure symptom/reason

• If no valid reason for HP 9000 application failure is found or, an inconsistent PA-RISC state is found – it could be an ARIES problem
  – HP will provide a diagnostic version of ARIES to the customer and get ARIES trace logs
  – HP will provide suitable steps to help triage the problem
  – If required, ARIES lab might request access to customer system to analyse the problem
ARIES support -- troubleshooting

• Refer to ARIES web page http://www.hp.com/go/aries
  – FAQ: for frequently asked questions on ARIES
  – ARIES Troubleshooting: for common issues and recommended solutions under ARIES

• Multi-threaded applications may fail under ARIES with `errno` set to `EAGAIN` while creating large no. of threads
  – Increase the value of kernel tunable parameter `pa_maxssiz_32bit`
  – Increase the value of ARIES option `-heapssz`

• Some applications e.g. Oracle client require install time re-linking through `cc` driver – this does not work out of the box
  – Install following (or later) patches
    • PHSS_34420: s700_800 11.23 bundled PA C compiler on IPF
    • PHSS_36342: s700_800 11.23 linker + fdp cumulative patch
  – Export `STDROOT` and `TARGETROOT` environment variables to `/usr/ccs/pa`
  – Add `-pa20` to Java invocation command line
ARIES support -- troubleshooting

• If 32-bit application `malloc()` fails under ARIES with `errno` set to `ENOMEM`
  – If memory allocation requested for more than 500 MB at one go
  – Ensure that `maxdsiz` kernel tunable parameter value and swap size are sufficient
  – Ensure that `pa_maxssiz_32bit` kernel tunable parameter value is not too large unless absolutely necessary in case of more than 86 threads required per process
  – 64-bit applications are not likely to experience this behavior under ARIES

• To use `chatr` command for HP 9000 executables on HP Integrity servers
  – `SDKROOT=/usr/ccs/pa chatr <pa_risc_executable>`
  – Applicable to all commands under `/usr/ccs/pa/usr/ccs/bin`

• To invoke HP 9000 JVM on HP Integrity servers
  – Ensure that HP 9000 JVM is installed properly on your Integrity server
    • `java -pa20 -version` should not result in an error
    – **Recommended:** add `-pa20` to java invocation command line
    – **Alternatively:** create an `.ariesrc` file with “`*/java -pa_os_cpu`”
ARIES support -- troubleshooting

Using HP-UX tools to triage performance issues

- **Caliper**: Can be used to triage ARIES performance issues since ARIES is the actual entity running on the Integrity HP-UX server. Caliper like output cannot be obtained for the HP 9000 application.

- **Glance** and **Prospect**: System information reported by Glance is valid, but information like flat profile will pertain to ARIES and its emulation of the HP 9000 application rather than the application alone.

- All the information about kernel behaviour e.g. system call usage pattern for an HP 9000 emulated application will be valid under ARIES mode.
Topics

1. Why HP Integrity?
2. ARIES objectives
3. ARIES overview
4. Upcoming solutions – MITR and XPADE
5. ARIES supportability features
6. ARIES deployment: items to consider
7. ARIES performance implications
8. ARIES options overview
9. ARIES latest releases and patches
10. ARIES robustness
11. ARIES limitations
12. ARIES support
13. ARIES testimonials, and success stories
14. ARIES: HP products supported
15. ARIES resources
16. Summary
ARIES customer testimonials

- **Strong and growing momentum**
- ARIES is a proven solution that has **successfully** helped in a number of high-profile migrations
- Used worldwide in every region and industry vertical

“**I’ve never heard about ARIES related trouble after the cut over. Performance better than expected.**”

**Major Telecom company in APJ**

“**We met some troubles with ARIES. But we were able to provide applications to our customers under ARIES as promised. It’s owing to HP’s great support.**”

**Major diversified research company in APJ**

“**Quite impressed. The A-AUTO v4 application worked like a charm under ARIES. No problems.**”

**BSP Inc. Japan**

“*The ARIES technology made it possible for us to support the HP-UX Integrity platform for SAP customers in a cost effective and timely manner.*”

**Adobe Systems Inc.**

“*The Aries translator, which dynamically translates HP-UX on PA-RISC to HP-UX on Integrity binaries in real time, was used for many of the custom programs BT had written over the years. Initially, internal BT customers were reluctant to have their applications run in emulation until they discovered how much more performance they would be receiving on Integrity.*”

**British Telecom to IDEAS International Inc. for a white paper. Refer paragraph 4 on page 8 of http://h71028.www7.hp.com/ERC/downloads/HP_PARISC_Final-jr.pdf**
# ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Diversified technology and products company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Diversified technology and products company</td>
</tr>
<tr>
<td>Region</td>
<td>EMEA</td>
</tr>
<tr>
<td>Applications</td>
<td>Java based document print format software</td>
</tr>
</tbody>
</table>
| Problem statement | - The customer is using old version of software not available natively on HP-UX 11i on HP Integrity servers  
- The product is beyond end-of-life and ISV was acquired by another software vendor. The original product is replaced by a new software suite  
- The application formats the input data and outputs PCL file  
- Quickest time to solution considerations |
| ARIES solution | - The product works fine under ARIES  
- Provided workaround for an issue which caused 64-bit executable to abort  
- Performance under ARIES on rs3600 Integrity server as good or better than rp5400 HP 9000 server |
| Remarks | |

## Diversified Industry - Feb 2008

When Diversified technology and products company Customer

The product works fine under ARIES

Provided workaround for an issue which caused 64-bit executable to abort

Performance under ARIES on rs3600 Integrity server as good or better than rp5400 HP 9000 server
## ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Adobe Systems Inc. and SAP AG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>All</td>
</tr>
<tr>
<td>When</td>
<td>Jan 2008</td>
</tr>
<tr>
<td>Industry</td>
<td>Diversified</td>
</tr>
<tr>
<td>Region</td>
<td>World wide</td>
</tr>
<tr>
<td>Applications</td>
<td>SAP Interactive Forms by Adobe on SAP Netweaver Platform</td>
</tr>
</tbody>
</table>
| Problem statement   | - SAP Interactive Forms by Adobe are not available natively on HP Integrity servers  
|                     | - Underlying Adobe Document Services (ADS) required to convert SAP data into PDF format  
|                     | - SAP customers running HP Integrity servers with HP-UX 11i want SAP Interactive Forms by Adobe to be available and supported  |
| ARIES solution      | - HP team assisted Adobe in evaluation of Adobe Document Services under ARIES on HP Integrity Servers  
|                     | - Customers will be able to use SAP Interactive Forms by Adobe for running SAP Netweaver 7.0 SP14 on HP Integrity servers with HP-UX 11i  |
| Remarks             | - SAP Interactive Forms by Adobe on SAP Netweaver platform are supported on HP-UX 11i v2 and v3 for HP Integrity servers under ARIES  
|                     | - “The ARIES technology made it possible for us to support the HP-UX Integrity platform for SAP customers in a cost effective and timely manner”  
|                     | – Adobe Systems Inc                                  |
ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Open Source/ Connect Internet Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Leading telecommunications company</td>
</tr>
<tr>
<td>When</td>
<td>Nov 2007</td>
</tr>
<tr>
<td>Industry</td>
<td>ICT (Internet Communications and Telecommunications)</td>
</tr>
<tr>
<td>Region</td>
<td>EMEA</td>
</tr>
<tr>
<td>Applications</td>
<td>PDFTK (PDF Tool Kit) and libgcc</td>
</tr>
<tr>
<td>Problem statement</td>
<td>- The customer application environment had dependency on PDFTK application which is not available native on HP-UX 11i on HP Integrity servers</td>
</tr>
<tr>
<td></td>
<td>- PDFTK-1.41 was ported to HP 9000 platform by Connect Internet Solutions</td>
</tr>
<tr>
<td></td>
<td>- Due to limited resources the application could not be ported in time to HP Integrity servers to meet customer deadline</td>
</tr>
<tr>
<td></td>
<td>- PDFTK Is used for easy manipulation of PDF files</td>
</tr>
<tr>
<td>ARIES solution</td>
<td>- Customer accepted the suggestion to run PDFTK-1.41 and it’s runtime dependency libgcc run under ARIES on HP Integrity servers</td>
</tr>
<tr>
<td></td>
<td>- The PDFTK application works fine under ARIES on HP Integrity servers</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
</tr>
</tbody>
</table>
**ARIES: references and success stories**

<table>
<thead>
<tr>
<th>ISV</th>
</tr>
</thead>
</table>
| Customer | **Leading bio-tech company**  
| When | Sept 2007  
| Industry | Biotechnology  
| Region | North America  
| Applications | 8 critical applications and many in-house developed applications in C and C++  
| Problem statement |  
| - | Due to FDA regulations, the customer could not recompile the code on HP Integrity servers  
| - | Migration to HP Integrity platform to replace old K-class HP 9000 servers  
| ARIES solution |  
| - | Smooth migration to HP Integrity servers under ARIES  
| - | Applications migrated from HP-UX 10.20 to HP-UX 11i v2  
| Remarks |  
| - | Customer impressed with binary compatibility across HP-UX versions and from HP 9000 servers to HP Integrity servers  

## ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Oracle Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>All</td>
</tr>
<tr>
<td>When</td>
<td>Aug 2007</td>
</tr>
<tr>
<td>Industry</td>
<td>Database and information management applications</td>
</tr>
<tr>
<td>Region</td>
<td>World wide</td>
</tr>
<tr>
<td>Applications</td>
<td>Oracle database client application version 10g R2</td>
</tr>
</tbody>
</table>

### Problem statement
- Oracle database client application support under ARIES on HP-UX 11i on HP Integrity servers
- Certain customer application environments require using Oracle database client application in ARIES mode on HP Integrity servers

### ARIES solution
- Oracle evaluated and certified database client application 10g R2 under ARIES on HP Integrity servers
- Oracle officially supports the HP 9000 database client application 10g R2 (10.0.0.2) under ARIES on HP Integrity servers
- For more details refer to Doc ID **Note:456553.1** on [Oracle Metalink](https://metalink.oracle.com) site

### Remarks

**Note:**
# ARIES: references and success stories

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISV</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Customer</strong></td>
<td><strong>British Telecom (BT)</strong></td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>2007</td>
</tr>
<tr>
<td><strong>Industry</strong></td>
<td>Telecommunication</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td>UK</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>In house developed custom applications</td>
</tr>
</tbody>
</table>
| **Problem statement** | - Customer environment had many applications developed in-house many years in the past  
|                       | - Quickest time to solution considerations         |
| **ARIES solution** | - The applications were deployed under ARIES on HP Integrity servers  
|                       | - All applications worked well under ARIES and performance was better than the HP 9000 servers |
| **Remarks** | - “The Aries translator, which dynamically translates HP-UX on PA-RISC to HP-UX on Integrity binaries in real time, was used for many of the custom programs BT had written over the years. Initially, internal BT customers were reluctant to have their applications run in emulation until they discovered how much more performance they would be receiving on Integrity.” |

**BT to IDEAS International Inc. for a white paper. Refer paragraph 4 on page 8 of http://h71028.www7.hp.com/ERC/downloads/HP_PARISC_Final-jr.pdf**
### ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Data management solution provider company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Information and communication company</td>
</tr>
<tr>
<td>When</td>
<td>March 2007</td>
</tr>
<tr>
<td>Industry</td>
<td>Telecommunication</td>
</tr>
<tr>
<td>Region</td>
<td>APJ</td>
</tr>
<tr>
<td>Applications</td>
<td>Data cleansing application</td>
</tr>
</tbody>
</table>

#### Problem statement

- C++ based data cleansing application with Unicode encoding support
- The application is not available natively on HP-UX 11i on HP Integrity servers
- Quickest time to solution considerations

#### ARIES solution

- The application was evaluated under ARIES and worked fine
- The application was migrated from PA8900@1000 MHz based HP 9000 servers to Madison 9M based HP Integrity servers
- The ARIES mode performance was 20% **better** than HP 9000 server performance
- ARIES mode performance gain achieved by using two phase dynamic translation (\(-sched\_trace\) ARIES option)

#### Remarks

After the ARIES based deployment at customer site, the application was ported by ISV to Integrity native
# ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td><strong>Lyon Highways Monitoring Center</strong></td>
</tr>
<tr>
<td>When</td>
<td>March 2006</td>
</tr>
<tr>
<td>Industry</td>
<td>Road transport management</td>
</tr>
<tr>
<td>Region</td>
<td>France</td>
</tr>
<tr>
<td>Applications</td>
<td>CORALY (Coordination et Régulation du traffic de l’Agglomération Lyonnaise)</td>
</tr>
</tbody>
</table>
| Problem statement | - Migration of Lyon highways monitoring center from Tru64/Alpha to HP-UX 11i on HP Integrity servers  
- CORALY is a traffic-management system run by operators of roads in the Lyon region, which bear the heaviest traffic in France. An operator, Direction Départementale de l’Équipement du Rhône, worked with systems integrator AMEC SPIE to develop this collaborative, real-time infrastructure, which dissolves bottlenecks in minutes and improves road safety. AMEC SPIE recently moved CORALY from HP Tru64 UNIX®-based HP AlphaServer systems to an HP-UX 11i v2 environment comprising HP Integrity servers, boosting performance by 40 percent and providing the capacity for continued innovation and expansion |
| ARIES solution | - ARIES runs the application layer that remotely interfaces with the new CORALY environment |
| Remarks | For more details refer HP case study at  
ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Retail chain company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Retail chain company</td>
</tr>
<tr>
<td>When</td>
<td>2006</td>
</tr>
<tr>
<td>Industry</td>
<td>Retail</td>
</tr>
<tr>
<td>Region</td>
<td>Worldwide</td>
</tr>
<tr>
<td>Applications</td>
<td>OLTP applications related to retail industry</td>
</tr>
</tbody>
</table>
| Problem statement | - The applications were originally developed for HP e3000 MPE/iX platform  
- Porting the legacy applications seemed very difficult task, particularly when the application was written for non-HP-UX environment  
- The applications were first migrated to HP 9000 servers using an emulator |
| ARIES solution | - The emulated code on HP 9000 Is migrated to HP-UX 11i on HP Integrity servers and executed under ARIES  
- There was one translation issue found in ARIES. A workaround was provided to ensure smooth migration to HP Integrity servers  
- Some changes were made to application scripts to take advantage of HP-UX 11i features on HP Integrity servers for better performance |
| Remarks | |

<table>
<thead>
<tr>
<th>Problem statement</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| ISV               | Customer | Retail chain company | When | 2006 | Industry | Retail | Region | Worldwide | Applications | OLTP applications related to retail industry | Problem statement | - The applications were originally developed for HP e3000 MPE/iX platform  
- Porting the legacy applications seemed very difficult task, particularly when the application was written for non-HP-UX environment  
- The applications were first migrated to HP 9000 servers using an emulator | ARIES solution | - The emulated code on HP 9000 Is migrated to HP-UX 11i on HP Integrity servers and executed under ARIES  
- There was one translation issue found in ARIES. A workaround was provided to ensure smooth migration to HP Integrity servers  
- Some changes were made to application scripts to take advantage of HP-UX 11i features on HP Integrity servers for better performance | Remarks | |
ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Pharmaceutical retail chain company</td>
</tr>
<tr>
<td>When</td>
<td>2006</td>
</tr>
<tr>
<td>Industry</td>
<td>Pharmaceutical retail</td>
</tr>
<tr>
<td>Region</td>
<td>North America</td>
</tr>
<tr>
<td>Applications</td>
<td>Pharmaceutical retail applications involving some Java components</td>
</tr>
</tbody>
</table>
| Problem statement | - ISV application caters to pharmaceutical products distribution and retailing automation  
                        - Deployed in more than 1000 geographically distant stores  
                        - ISV application not available native on HP-UX 11i on HP Integrity servers |
| ARIES solution | - Application works as is, under ARIES  
                          - ISV supports the application running under ARIES for this customer  
                          - By migrating to HP Integrity servers using ARIES customer experienced better performance except for Java based components |
| Remarks      |                   |
### ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>Major world wide telecom service provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Major world wide telecom service provider</td>
</tr>
<tr>
<td>When</td>
<td>2005</td>
</tr>
<tr>
<td>Industry</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>Region</td>
<td>EMEA</td>
</tr>
<tr>
<td>Applications</td>
<td>Telecom applications</td>
</tr>
</tbody>
</table>

#### Problem statement
- Quickest time to solution considerations
- Moved to HP Integrity servers for the superior performance, consolidation and growth benefits
- Telecom software not available native on HP Integrity servers

#### ARIES solution
- Key portions of telecom software stack certified under ARIES
- Emulated stack is an interim solution
- Performance under ARIES on Madison 9M based HP Integrity server 10% better than PA8800 based HP 9000 servers

#### Remarks
# ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Major confectioner</td>
</tr>
<tr>
<td>When</td>
<td>March 2005</td>
</tr>
<tr>
<td>Industry</td>
<td>Confectionery</td>
</tr>
<tr>
<td>Region</td>
<td>EMEA</td>
</tr>
<tr>
<td>Applications</td>
<td>Open View Operations for UNIX (OVOU) 7.1, Network Node Manager (NNM) AE 7.5, Oracle database application client 9i</td>
</tr>
</tbody>
</table>
| Problem statement | - Non availability of OVOU 7.1 and NNM AE 7.5 natively on HP Integrity servers  
| | - Quickest time to solution  
| | - HP Integrity native port of applications planned after 1.5 years |
| ARIES solution | - HP made limited period release of OVOU 7.1 and NNM AE 7.5 under ARIES for HP Integrity servers  
| | - Architecture dependent installation problems encountered while installing OVOU and NNM under ARIES on HP Integrity servers  
| | - The installation issues were related to checking of processor and HP-UX versions by the installation program – to resolve the issue `uname` command from HP 9000 servers was used along with ARIES option `--pa_os_cpu` |
| Remarks   | OVOU 8.2 and NNM AE 7.51 are available native on HP Integrity servers |
## ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td><strong>Major telecommunication company</strong></td>
</tr>
<tr>
<td>When</td>
<td>2004</td>
</tr>
<tr>
<td>Industry</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>Region</td>
<td>APJ</td>
</tr>
<tr>
<td>Applications</td>
<td>Applications used for bridging different types of network</td>
</tr>
</tbody>
</table>

**Problem statement**
- Non availability of applications on HP-UX 11i on HP Integrity servers
- Porting the application difficult due to dependency on legacy libraries
- Environment comprises of several applications developed in C++
- System operations intensive with about 4500 processes in simulated environment
- Quickest time to solution

**ARIES solution**
- During evaluation phase, found few issues related to ARIES handling of asynchronous signals - all ARIES issues were resolved before deployment
- Performance under ARIES **1.5x faster** on rx5670 vs. PA8700 @ 750 MHz

**Remarks**
*In production since mid 2004*
**ARIES: references and success stories**

<table>
<thead>
<tr>
<th>ISV</th>
<th>Major diversified research and consulting company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>All</td>
</tr>
<tr>
<td>When</td>
<td>2004</td>
</tr>
<tr>
<td>Industry</td>
<td>Diversified research and consulting</td>
</tr>
<tr>
<td>Region</td>
<td>APJ</td>
</tr>
<tr>
<td>Applications</td>
<td>System management software</td>
</tr>
</tbody>
</table>

**Problem statement**

- Application consists of Manager (Management Server), Agent (Client), Browser (Management Console) - only Agent component supports UNIX
- Application Agent component is built on HP-UX 11.00 for HP 9000 servers
- ISV wants to use only one set of binaries to support all HP-UX versions across HP 9000 and HP Integrity servers
- Some customers are using the application Agent component on HP-UX 11.00. ISV will consider building the application for HP-UX 11.11 if their customers migrate to higher HP-UX versions
- The application Agent component provides custom APIs to call agent from customer’s program

**ARIES solution**

- ISV supports the application Agent component under ARIES on HP-UX 11i on HP Integrity servers
- ARIES has helped the ISV to use only one set of binaries to support all HP-UX versions across HP 9000 and HP Integrity servers
- During the evaluation phase couple of ARIES issues were reported which were quickly resolved

**Remarks**

Currently ISV supports the application Agent under ARIES on HP-UX 11i v2 only
ISV may start application Agent support on HP-UX 11i v3 under ARIES in near future
ARIES: references and success stories

<table>
<thead>
<tr>
<th>ISV</th>
<th>BSP Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>All</td>
</tr>
<tr>
<td>When</td>
<td>2004</td>
</tr>
<tr>
<td>Industry</td>
<td>Enterprise IT systems operations and management</td>
</tr>
<tr>
<td>Region</td>
<td>Japan</td>
</tr>
<tr>
<td>Applications</td>
<td>A-AUTO</td>
</tr>
<tr>
<td></td>
<td>Loganizer/Agent</td>
</tr>
</tbody>
</table>

**Problem statement**

- Applications not available natively on HP Integrity servers
- ISV Customers demand A-AUTO and Loganizer/Agent on HP Integrity servers
- Quickest time to solution
- A-AUTO is advanced automatic job scheduling software
- Loganizer/Agent is log management software

**ARIES solution**

- BSP supports A-AUTO and Loganizer/Agent applications under ARIES on HP Integrity servers
- Currently these applications are supported under ARIES on HP-UX 11i v2 on HP Integrity servers

**Remarks**

Support for BSP applications on HP-UX 11i v3 on HP Integrity servers is not yet planned
HP applications on ARIES

- WDB GUI
- SAM (System Administration Manager)
- Common Desktop Environment (CDE) and Xmofit
- Softbench (integrated development environment)
- Java (1.4, 1.5, 1.6) launcher program
- Many system commands on Integrity HP-UX servers
ARIES resources

- ARIES web page – **Updated!**
  - http://www.hp.com/go/aries
- Help for ISVs – **HP DSPP**
  - http://www.hp.com/go/dspp
- ARIES IEEE white paper
- Online ARIES manual page for HP-UX 11i v2
- HP-UX 11i v3 knowledge-on-demand webinar on ARIES – **New!**
- HP 9000 Evolution Program Provides a Smooth Path to Integrity Servers
ARIES resources

- HP-UX binary compatibility resources
  - ARIES Binary Compatibility and Product Support Statement – **New!**
  - HP-UX 11i compatibility for HP Integrity and HP 9000 servers

- On Integrity servers running HP-UX 11i v2 and higher
  - The ARIES manual page `aries(5)` contains an advanced level discussion of all the topics covered in this presentation

- To send comments or questions, follow the feedback link on ARIES web page at [http://www.hp.com/go/aries](http://www.hp.com/go/aries)
Summary

- ARIES is an integral part of HP-UX 11i OE for HP Integrity servers and is launched automatically upon PA-RISC executable invocation, to execute the application transparently
- ARIES is an excellent HP 9000 migration alternative to ISV application porting
- ARIES is a proven solution that has successfully helped in a number of high-profile migrations
- Strong HP commitment
  - ARIES is a fully supported HP product
  - ARIES is fully supported under HP VSE (Virtual Server Environment)
  - ARIES delivers accuracy and performance for emulated applications
  - Upcoming new solutions (Q3, 2008)
    - XPADE: PA-RISC Cross Development Environment on HP Integrity servers (HP-UX 11i v2 and v3)
    - MITR: Enable Integrity HP-UX native binaries to call HP 9000 shared libraries (HP-UX 11i v2)

“The Aries translator, which dynamically translates HP-UX on PA-RISC to HP-UX on Integrity binaries in real time, was used for many of the custom programs BT had written over the years. Initially, internal BT customers were reluctant to have their applications run in emulation until they discovered how much more performance they would be receiving on Integrity.”
