



HP-UX 11i Knowledge-on-Demand

HP technical Webcast series: software optimization



Technology for better business outcomes

HP-UX 11i v3 Knowledge-on-Demand

- Objective: Support software development partners and customers in achieving better business outcomes with HP-UX 11i.
- What HP is providing: a series of technical on-demand training Webcasts
 - Focused on helping developers increase performance through application optimization for HP-UX 11i v3 on HP Integrity servers
 - Access to HP for follow-up questions
 - Available at www.hp.com/go/knowledgeondemand

HP-UX 11i v3 Knowledge-on-Demand Webinars – planned curriculum

- Foundation Track
 - Module 1: How to upgrade to HP-UX 11i v3
 - Module 2: HP-UX open source resources
 - Module 3: Unified file cache
 - Module 4: Caliper
 - Module 5: NUMA Tuning: Getting the Most Out of Your Cellular Server by using NUMA
 - Module 6: The Mercury Library – Increasing Application Performance
 - Module 7: Software Transition Kit's (STK's) for HP-UX 11i v3
- Java Developers Track
 - Module 8: Java Memory Management - Internals and Performance
 - Module 9: HPjmeter – measure Java application performance on HP-UX 11i
 - Module 10: Solving Java performance problems
- C/C++ Developers Track
 - Module 11: pthreads enhancements in HP-UX 11i v3
 - Module 12: Kernel tracing & profiling tools (internal tools)
 - Module 13: Using compilers to get optimal performance
 - Module 14: HP Code Advisor: A Powerful New C/C++ Analysis Tool for HP-UX
 - Module 15: Montecito Hyper-Threading on HP-UX 11i v3

Additional Webinars
published going forward!

Related HP-UX 11i v3 resources

- All developers' resources
 - HP-UX 11i developers' content
www.hp.com/go/hpuxdev
 - HP-UX 11i v3 news, functionality, product download and services resources
www.hp.com/go/hpux11i
 - HP Integrity server ISV resources for DSPP members
www.hp.com/go/dspp_integrity
 - HP Integrity server product information
www.hp.com/go/integrity
- Software partner promotional opportunity
 - HP promotion for HP-UX 11i v3-ready software partner application
www.hp.com/go/v3promotion

Enjoy this Knowledge-on-Demand topic!

Thank you for taking time to learn about HP-UX 11i v3 and related technologies.

Please send comments on today's topic and/or requests for future topics to:

hpuxquestions@hp.com



Software Transition Kit's (STK's) for HP-UX

An HP-UX 11i Knowledge-on-Demand software optimization Webcast

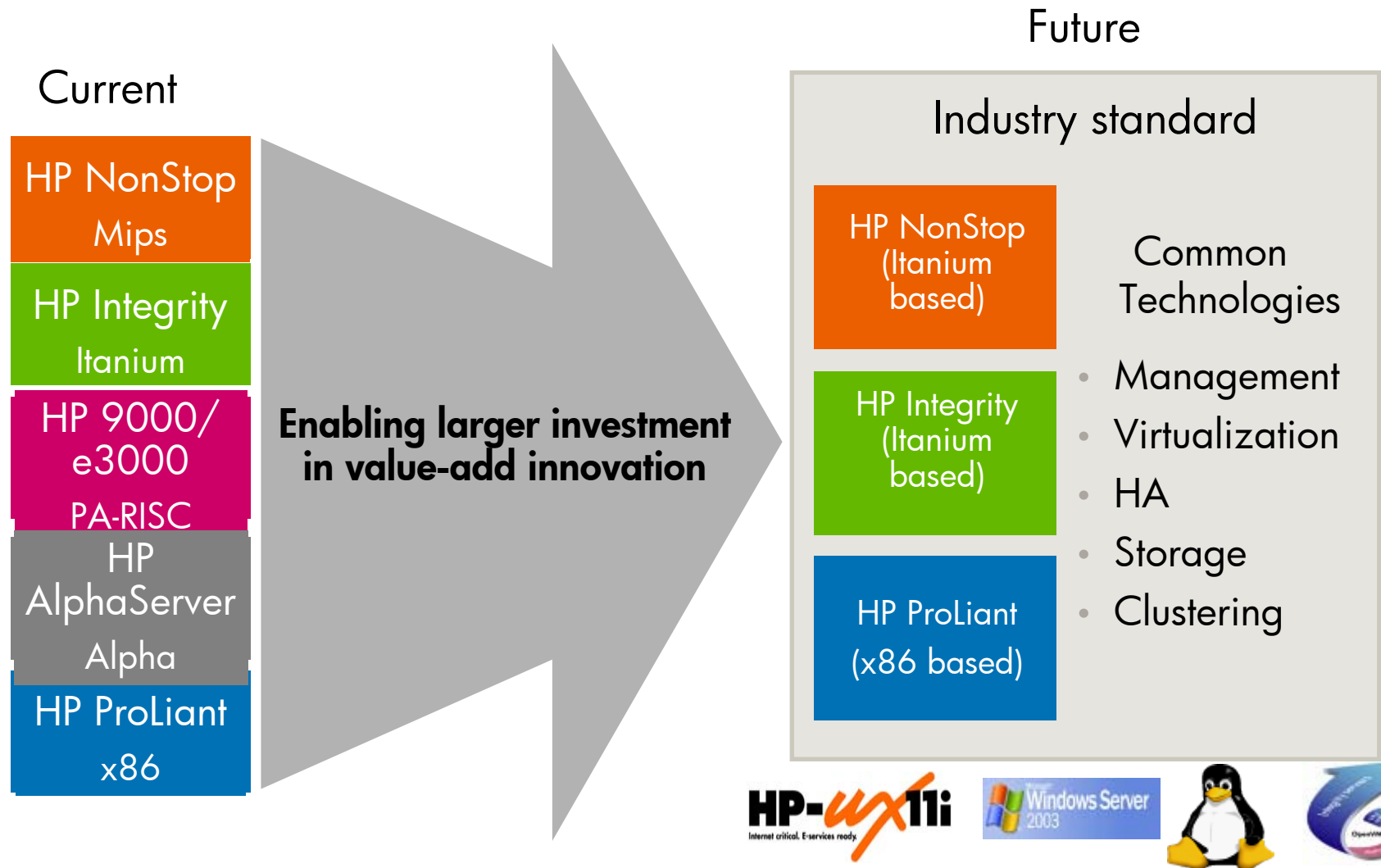


Technology for better business outcomes

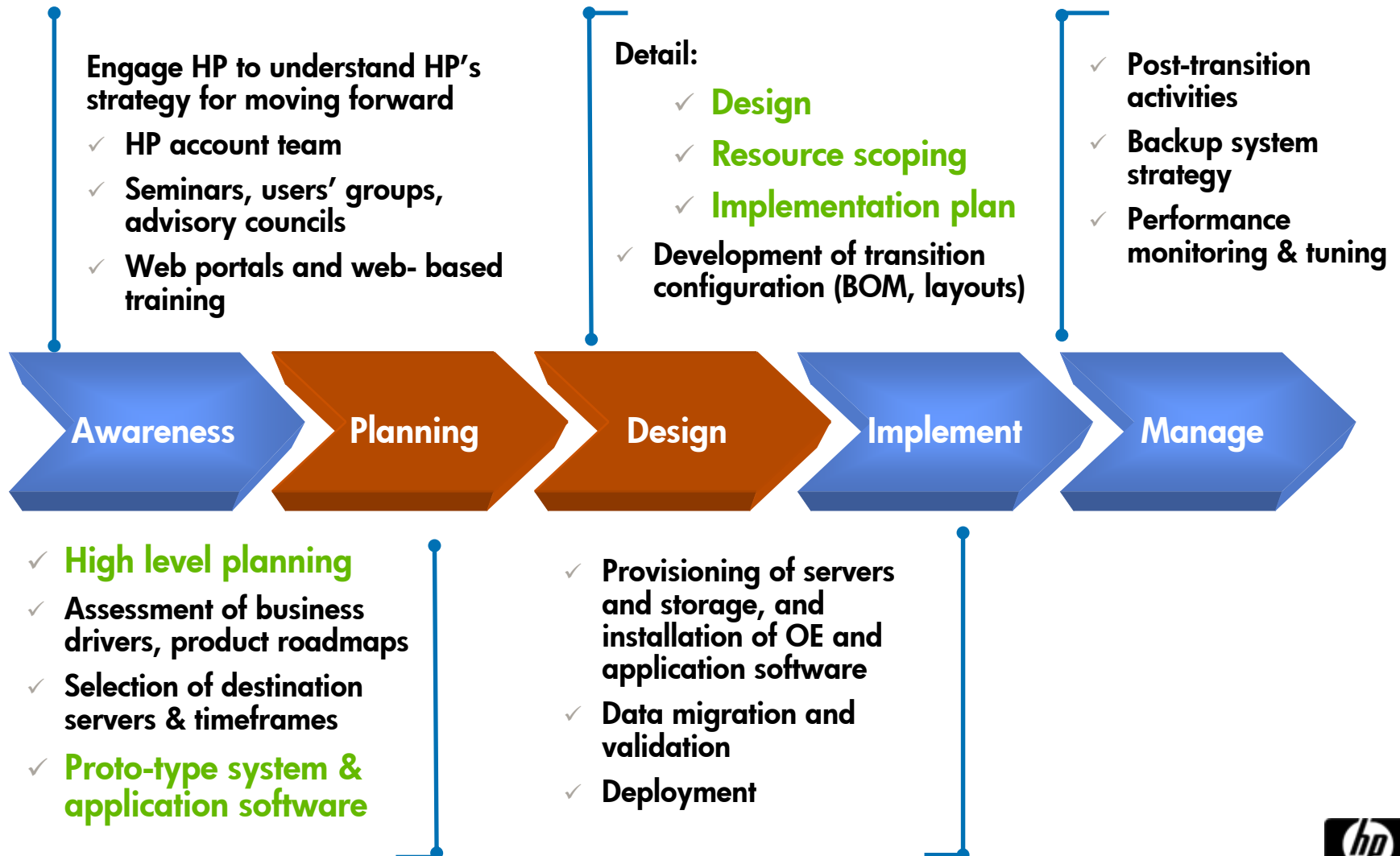
Agenda

- Transition life cycle
- HP-UX STK overview, features
- STK Usage examples
- References

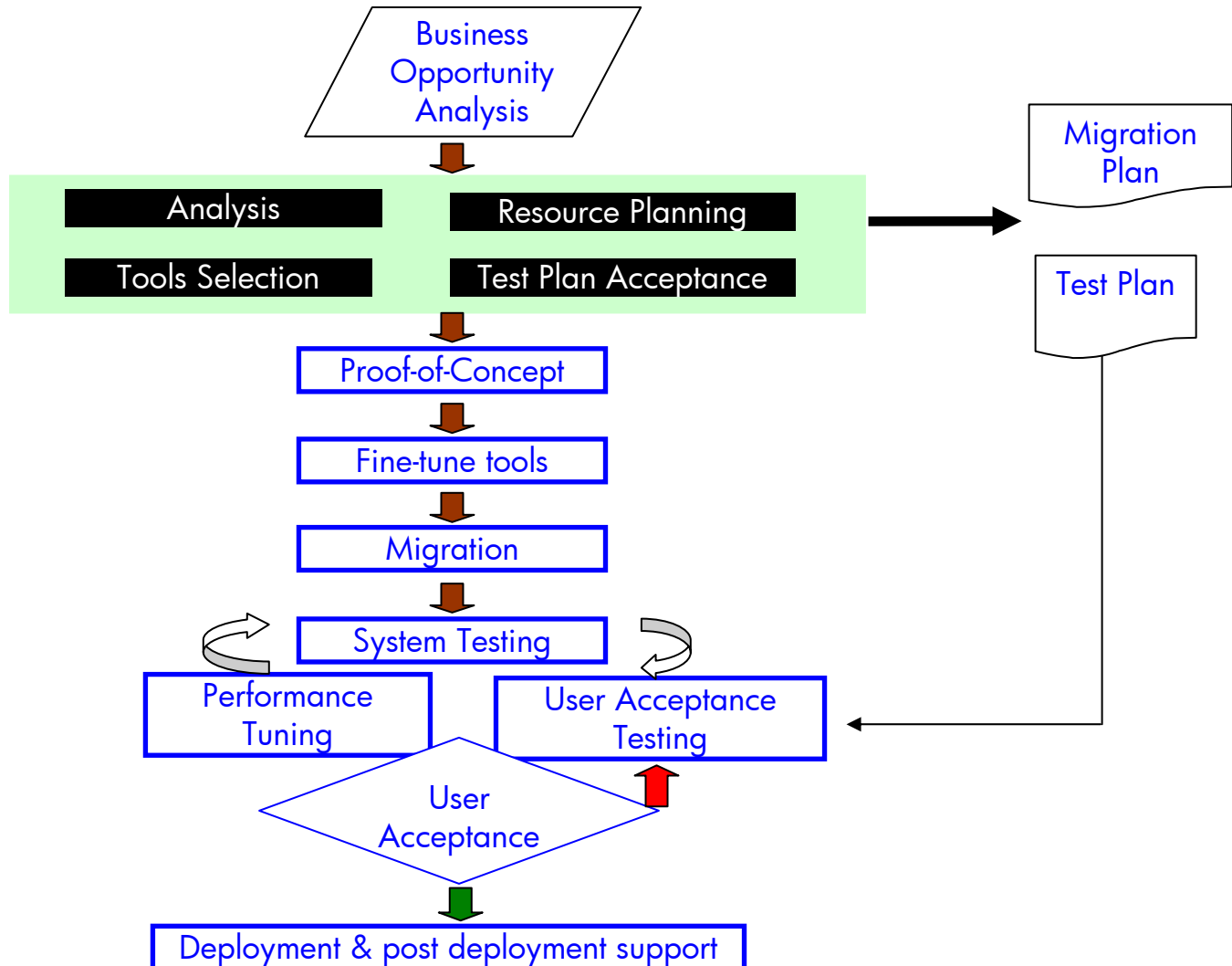
HP's Industry Standards Server Strategy



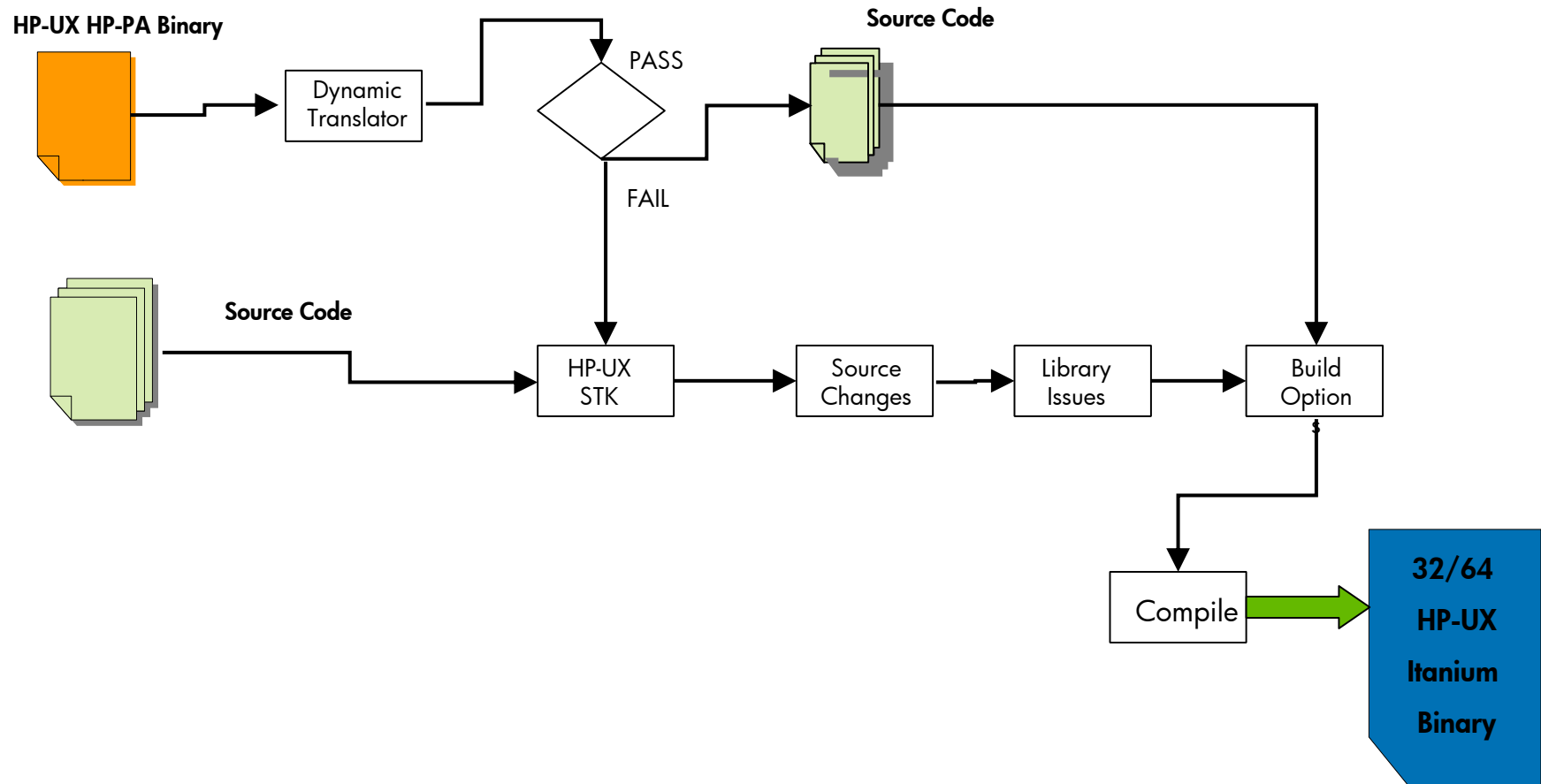
Transition Lifecycle : Customer Activities



Typical Application Migration Lifecycle



Migration Process



The HP-UX Software Transition Kits

- What is a STK ?
 - A collection of tools to scan source-level objects that indicate any transition problems
 - An associated database of possible issues in source of which the scanner is aware
 - Document database of information for developers – porting guides, etc.
- Where can you get It ?
 - <http://www.hp.com/go/STK>

The HP-UX Software Transition Kits

- Objectives of STK
 - Provide a method and framework to approach the transition planning and design.
 - Provide means to begin to gauge level of effort and transition duration.
 - Save time and effort in planning and designing the transition.

HP-UX Software Transition Kit

Tools to detect coding issues that require attention in porting from a Source Platform to HP-UX on Itanium[®] Systems

Supports C, C++, scripts, makefiles, other languages

Helps assess amount of work – Summary Report

Identifies specific lines of source code with issues - Detail Report

Generates a web (or text) report

Documentation to help software developers get their software running on HP-UX 11i

HP-UX 11i (32 and 64-bit)

http://<stkserver>/STK/advanced_use.html

What does STK do?

- Scan C, C++, Fortran, scripts and Makefiles
- Scan for incompatibilities in:
 - functions
 - commands
 - macros
 - structures and structure members
 - header files
 - language keywords
 - libraries
 - variables
- Output formats
 - html (default)
 - text

STK File Scanner Commands

- **scansummary**
 - Helps investigate or plan a transition
 - helps you plan your source code transition by determining the number of instances of API impacts in your source files
- **scandetail**
 - Helps perform a transition
 - helps you perform a transition by indicating exactly what API impacts occur on each line of your source files.
- Available for all versions of the STK: HP-UX, Tru64 UNIX, Solaris, and Linux.

Scansummary – Top Level pass on code

scansummary helps investigate or plan a transition

- reports **number and types** of API transition impacts in source files

scansummary html output

- #Instances: <IdentifierIcon>Synopsis1 (SynopsisID1)

Usage

```
#/opt/STK/bin/scansummary -r <source-directory>
```

This limits the scan to impacts pertaining to versions 11.22 through 11.23

```
#/opt/STK/bin/scansummary -O 11.22-11.23 -r <source-directory>
```

Scansummary

DEMO



Example scansummary Output



scansummary report
Tue Jul 31 11:29:57 2007

Output format: **Sorted by problem type, instances, and identifier**

Software transition: **HP-UX 11i to HP-UX 11i v2.0**

Host name: agana.india.hp.com
Directory path: /home/adharsh/demo_app/
Files scanned: 48
Lines scanned: 7151
Blank and comment lines: 3267
Lines containing source code: 3884

critical changed impacts		
Count	Type	Problem synopsis
9	* L	-IX11 - new locations, support native and PA applications
9	* L	-IXm - new locations, support native and PA applications
9	* L	-IXt- new locations, support native and PA applications
7	* C	cc - cannot cast a pointer smaller, and no zero length arrays allowed in Ae mode
7	* C	cc - floating point to integer conversion may produce different results
7	* C	cc - mismatched old-style functions without prototypes will not work correctly
7	* C	cc - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems
7	* C	cpp - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems
7	* C	ld - changes from 32-bit PA to 32-bit IPF
7	* C	ld - default behavior changed to +objdebug
7	* C	ld - changes and enhancements
6	* C	aCC - -AA is the default setting
6	* C	aCC - floating point to integer conversion may produce different results

Example scansummary Output



scansummary report
Tue Jul 31 13:55:34 2007

With -O 11.22-11.23 option

Output format: **Sorted by problem type, instances, and identifier**

Software transition: **HP-UX 11i v1.5 to HP-UX 11i v2.0**

Host name: agana.india.hp.com
Directory path: /home/adharsh/demo_app/
Files scanned: 48
Lines scanned: 7151
Blank and comment lines: 3267
Lines containing source code: 3884

critical changed Impacts

Count	Type	Problem synopsis
7	* C	cc - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems
7	* C	cpp - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems
6	* C	aCC - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems
1	H	pthread.h - default thread contention scope changed

non-critical changed Impacts

Count	Type	Problem synopsis
3	F	getmntent - Changes to HP-UX libc to affect AutoFS

non-critical non-standard Impacts

Count	Type	Problem synopsis
7	* C	cpio - not portable to some internationalized environments

Example scansummary Output

output format:

number of instances: (Identifier type) problem synopsis (synopsis ID)

```
22: [F] printf - formatted I/O now converts IEEE infinity and NaN values (NcWn222)
22: [F] printf - 64-bit changes in formatted I/O (CrCh447)
22: [F] printf - floating hex support (CrCh815)
10: [F] fprintf - formatted I/O now converts IEEE infinity and NaN values (NcWn222)
10: [F] fprintf - 64-bit changes in formatted I/O (CrCh447)
8: [F] memset - new performance archive library (NcEn669)
3: * [F] zero - proprietary interfaces obsoleted (CrOb418)
2: [F] malloc - new environment variables (NcEn670)
2: [F] malloc - new environment variables and defaults (NcWn764)
```

* identifier type may be inaccurate - impact may not apply.

Impact

- » **Dev Resource Central**
- » HP STK home

- HP-UX STK
 - » Home
 - » Overview
 - » Tools
 - » Documentation
 - » **Transition impacts**
 - » Identifier types
 - » **Impact list**
 - » Porting to HP-UX
 - » FAQ
 - » Glossary
 - » Help

- » Send us feedback

- Site maps
 - » HP-UX STK
 - » Dev Resource Central

HP-UX 11i v2.0 critical impact:

Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems (CrCh886)



Problem description

The HP aC++/C compiler supports much of the ISO/IEC 14882 Standard for the C++ Programming Language (the international standard for C++). When invoked as a C compiler, it supports the American National Standard for Information Systems - Programming language C, ANS X3.159-1989 (the ANSI C 89 standard), and it also supports the majority of the extensions introduced in ISO/IEC 9899:1999(E) (commonly referred to as "C99").

The functional changes to the HP aC++/C compiler are as follows :

- The `legacy_hpc/` subdirectory is no longer provided.
- The `+legacy_hpc` option is not supported in HP-UX 11iv2.
- C99 language extensions are supported.
- The new `-AA` compatible version of RW's tools.h++, version 7.1.1, `librwtool_v2` is included with this release.
- Covariant returns are now supported.
- Precompiled Headers (PCH) are now supported for C and C++.
- OpenMP V2.0 is fully supported.

The following options have been implemented:

- `+0failsafe`
- `+0noreturn`
- `+0preserved_fpregs` (internal only)
- `+0rotating_fpregs`
- `+0loopunroll`
- `+0noptxstoglobals`
- `+D011.22` and `+D011.23`

The new functionality previously listed will benefit customers who wish to use them in developing their applications, or who are porting applications that already make use of them. Removal of the deprecated legacy C compiler and tools should have minimal impact. It was provided in the HP-UX 11iv1.6 delivery as a "fallback." The new C support in aC++ is now complete and robust.

Delivery of the legacy HP-C compiler under the `/opt/ansi/legacy_hpc` directory was only a temporary safeguard for the 11iv1.6(11.22) release. It is being removed entirely from the 11iv2.0(11.23) release.

Scandetail – In-depth look by file and line

scandetail helps perform a transition at a file and line level identifies **each instance** of an API transition impact in source files

Usage

```
#!/opt/STK/bin/scandetail -r <source-directory>
```

scandetail html output

Filename:Lineo: <IdentifierIcon> Synopsis (SynopsisID)

This limits the scan to impacts pertaining to versions 11.22 through 11.23

```
#!/opt/STK/bin/scandetail -O 11.22-11.23 -r <source-directory>
```

Scandetail

DEMO



Example scandetail Output



scandetail report
Tue Jul 31 11:27:58 2007

Output format: **In order scanned**
Software transition: **HP-UX 11i to HP-UX 11iv2.0**

Host name: agana.india.hp.com
Directory path: /home/adharsh/demo_app/
Files scanned: 48
Lines scanned: 7151
Blank and comment lines: 3267
Lines containing source code: 3884

Impacts

src/systeminfo/xtosysinfo.cpp

Line	Type	Problem Synopsis
389	F	getmntent - Changes to HP-UX libc to affect AutoFS (NcCh887)

src/systeminfo/Makefile.solaris

Line	Type	Problem Synopsis
29	* C	cc - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems (CrCh886)
29	* C	cc - cannot cast a pointer smaller, and no zero length arrays allowed in Ae mode (CrCh773)
29	* C	cc - floating point to integer conversion may produce different results (CrCh776)
29	* C	cc - mismatched old-style functions without prototypes will not work correctly (CrCh788)
29	* C	cc - options and pragma changes for Itanium(R)-based systems (NcWn778)
29	* C	cc - changed linker options for 64-bit executables (NcWn446)
30	* C	CC - changed linker options for 64-bit executables (NcWn446)
36	* C	CC - changed linker options for 64-bit executables (NcWn446)
45	* C	ld - changes and enhancements (CrCh808)
45	* C	ld - changes from 32-bit PA to 32-bit IPE (CrCh771)

Example scandetail Output



scandetail report
Tue Jul 31 11:41:02 2007

With -O 11.22-11.23 option

Output format: **In order scanned**
Software transition: **HP-UX 11i v1.5 to HP-UX 11i v2.0**

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Lines scanned: 7151
Blank and comment lines: 3267
Lines containing source code: 3884

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src/systeminfo/Makefile.solaris

Line	Type	Problem Synopsis
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29	* C	cc - changed linker options for 64-bit executables (NcWn446)
30	* C	CC - changed linker options for 64-bit executables (NcWn446)
36	* C	CC - changed linker options for 64-bit executables (NcWn446)
45	* C	ld - changed linker options for 64-bit executables (NcWn446)
50	* C	CC - changed linker options for 64-bit executables (NcWn446)
82	* C	cpio - not portable to some internationalized environments (NcNs350)
89	* C	cpp - Changes to HP aC++/HP ANSI C Version A.05.50 for Itanium®-based Systems (CrCh886)
132	* C	CC - changed linker options for 64-bit executables (NcWn446)

Example scandetail Output



scandetail report
Tue Jul 31 11:27:58 2007

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Software transition: **HP-UX 11i to HP-UX 11iv2.0**

Host name: agana.india.hp.com
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Example scandetail Output



scandetail report
Tue Jul 31 11:41:02 2007

With -O 11.22-11.23 option

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Example scandetail Output

output format:

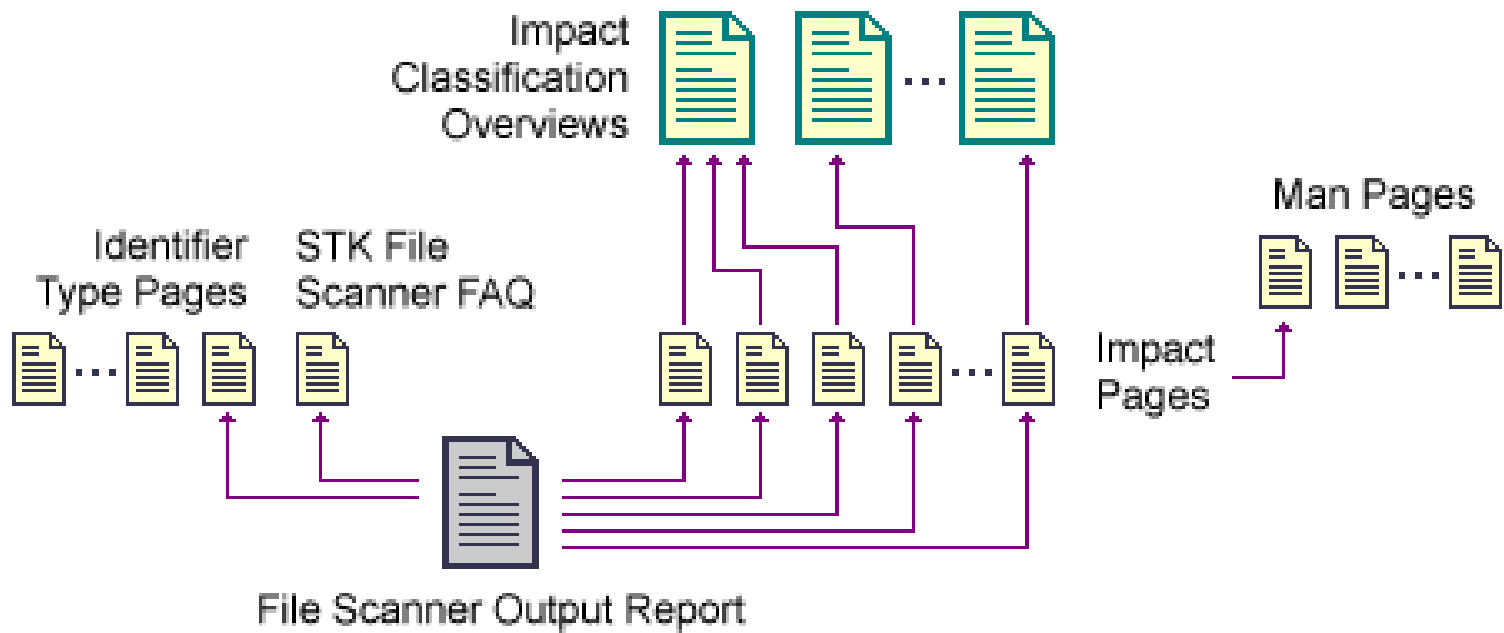
file name:line number: (Identifier type) problem synopsis (synopsis ID)

```
cpu accel.c:148: [F] signal - some behavior changes (CrCh820)
cpu accel.c:158: [F] signal - some behavior changes (CrCh820)
cpu accel.c:160: [F] signal - some behavior changes (CrCh820)
cpu accel.c:171: [F] signal - some behavior changes (CrCh820)
cpu accel.c:208: [F] signal - some behavior changes (CrCh820)
cpu accel.c:219: [F] signal - some behavior changes (CrCh820)

list.c:120: * [C] last - New libC APIs and some changes to HP-UX commands (CrCh852)
list.c:120: * [C] last - -f option supported (NcEn492)

memcpy.c:48: [I] size t - type now unsigned long (CrCh275)
memcpy.c:132: [I] size t - type now unsigned long (CrCh275)
memcpy.c:165: [I] size t - type now unsigned long (CrCh275)
memcpy.c:168: [I] size t - type now unsigned long (CrCh275)
memcpy.c:253: [I] size t - type now unsigned long (CrCh275)
memcpy.c:256: [I] size t - type now unsigned long (CrCh275)
memcpy.c:304: [I] size t - type now unsigned long (CrCh275)
memcpy.c:307: [I] size t - type now unsigned long (CrCh275)
memcpy.c:374: [I] size t - type now unsigned long (CrCh275)
```

STK – Content Organization



STK Impact Classifications

- Groupings of potential source code issues for review and correction.
- Configurable search and reporting of potential needed changes



Itanium architecture



64-bit APIs



Binary compatibility



64-bit impacts to 32-bit software



Networking



Threads



Standards compliance



Dates



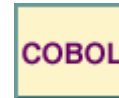
Large user and group ID



Large files



aCC compiler



COBOL compiler



Fortran 90 compiler

Software Transition Kit - Features

- Scan files - (source and Libraries)
- Provides multiple filtering options with a (+) include or (-) exclude.
- Impact Classification Reference Documentation to help identify source code issues
- Can provide html indexed reporting to browse and locate specific issues and their suggested actions.
- Can link to other resource sites - HP as well as others (Intel).
- Can be installed on your source platform, your destination platform, or both.

A STK Operational Overview

- All the STKs are operationally identical
- Output from the STK is dependent on the source platform
- File scanners are invoked via the command line – these commands are specific to the STK platform
- HTML output is viewable through any standard web browser
- To get any real value from the STK it needs to be setup as a web application
- To get good reports you will need to specify options when scanning source files

The HP-UX Software Transition Kits

Versions Available Today

PA to HP-UX Itanium Software Transition Kit

Tru64 to HP-UX Itanium Software Transition Kit

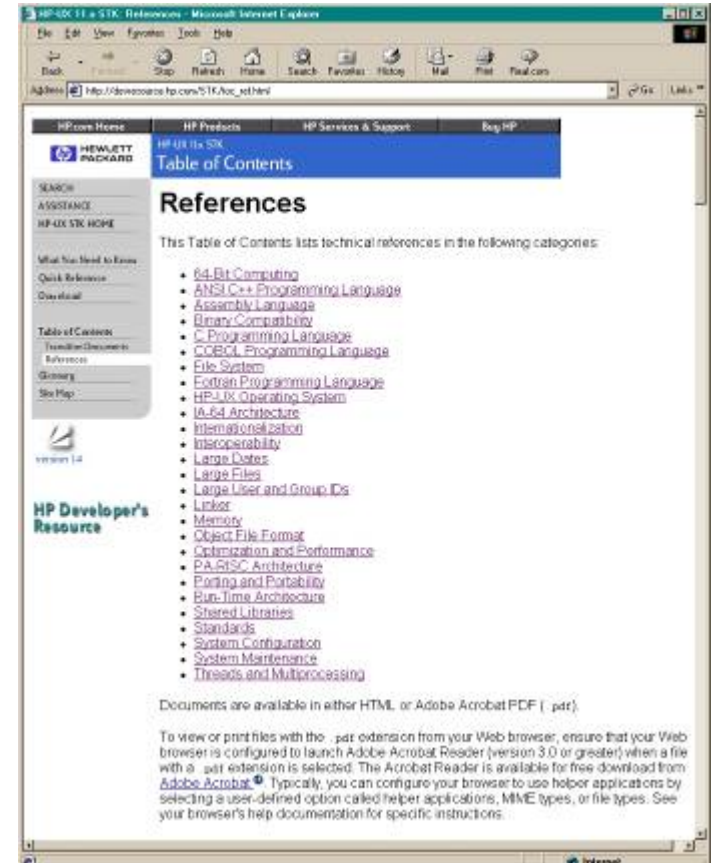
Solaris to HP-UX Itanium Software Transition Kit

Linux to HP-UX Itanium Software Transition Kit

STK Reference Library

Hyperlinked to :

- External Sites (i.e. Intel)
- HP Developer Resources
- Language and Tools
- Porting and Portability
- Itanium Architecture
- Libraries
- Object File Formats
- and MORE.....



Websites for further information

Application transition

<http://devresource.hp.com/drc/topics/apptrans.jsp>

HPUX PA to IA transition home page.

http://devresource.hp.com/drc/topics/hpux_hpux.jsp

STK

<http://www.hp.com/go/STK>

Binaryscan

<http://devresource.hp.com/drc/resources/binaryScan/download.jsp>

Success Stories

<http://h71028.www7.hp.com/integrity/cache/405502-0-0-0-121.aspx>

Note:

STK is migrating from devresource (DRC) to a new server DSPP.

Please visit www.hp.com/go/dspp after October 2007 for STK related information.

Printable Document Database

Available for study away from the computer

Supplied in Adobe Acrobat (.pdf) format

Subsets of STK web documents

Key available documents:

1. Getting Started with the HP-UX 11.x Software Transition Kit
2. Overview of HP-UX 11.x and the Software Transition Kit
3. Qualifying Software for HP-UX 11.x
4. Planning to Port Software to HP-UX 11.x
5. Performing a Port to HP-UX 11.x
6. HP-UX STK Tool Reference
7. HP-UX 64-bit Porting and Transition Guide

Key Takeaways

- STK is a good starting tool for code analysis
 - Good tool for large code base examination
 - Quick way to see the scope of work to be done
 - Gateway to local and remote resources
 - Multi-user tool
 - Open to tool integration
 - configure editor so clicking on an error takes you to the file and line

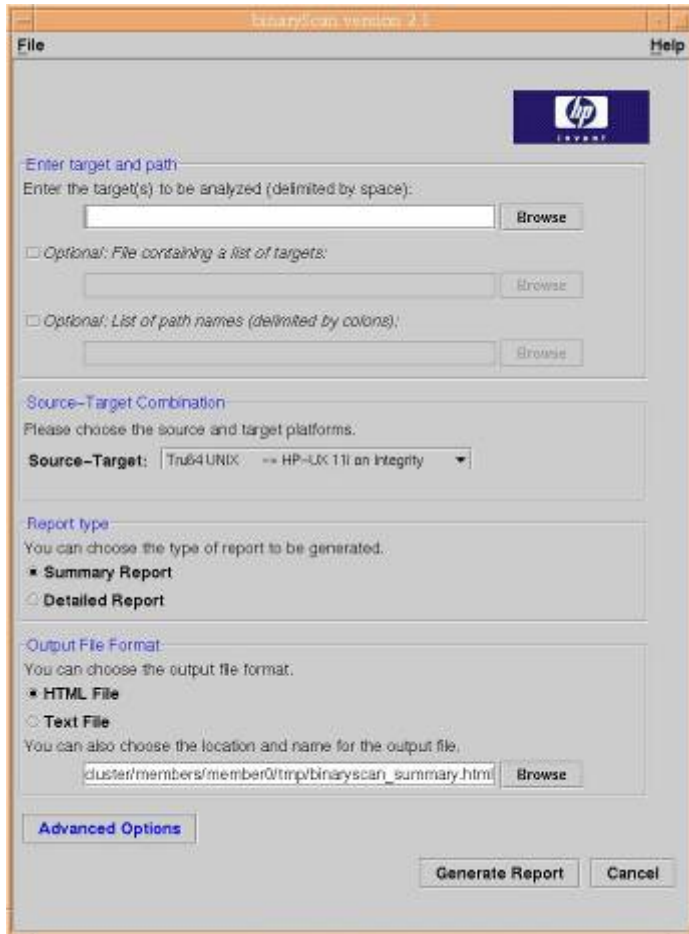
Thank You



Binaryscan -Scoping the transition effort

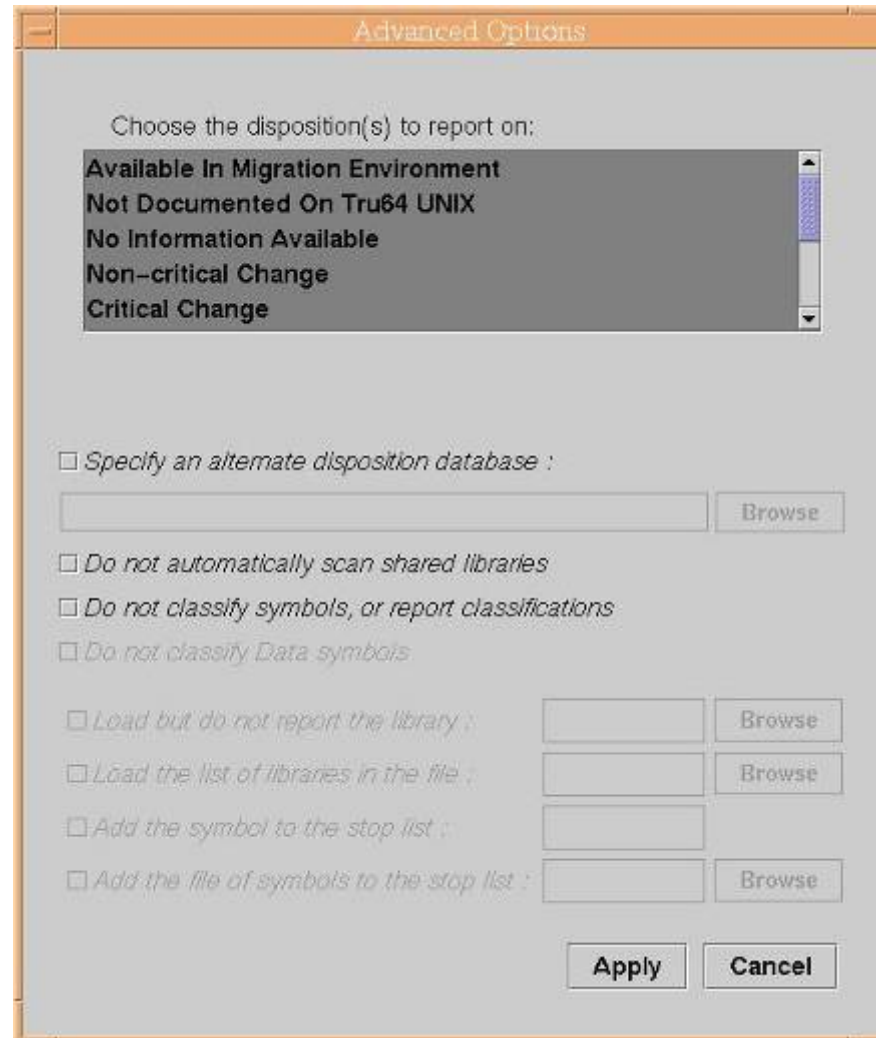
- **binaryScan**, a convenient and free scoping tool
 - an application transition assessment tool
 - Provides a quick assessment of porting effort
 - scans dynamically linked executables, scans shared libraries linked by the executables
 - Reports API/ABI compatibility
 - Supports upgrades from older versions of HP-UX
 - Supports transitions from Tru64 UNIX and Solaris

binaryScan wizard



- **binaryScan** for Tru64 UNIX (example shown)
 - Supports HP-UX 11i v2 on Integrity as destination platform
 - Flags TruCluster and AdvFS APIs
 - Flags APIs available in Migration Environment

binaryScan wizard (cont.)



binaryScan report

Application Program Interface Compatibility Report - Mozilla Firefox

file:///C:/Documents%20and%20Settings/FontaineB/Local%20Settings/Temporary%20Internet%20Files/OLK179/bin

We provided the following index to help you navigate through sections of this report and to better understand what each section means to your application. Thank you for using binaryScan.

- [Scanned Target Report](#)
- [Options Used Report](#)
- [Warnings Report](#)
- [Description of Options](#)
- [Explanation of Warnings](#)
- [binaryScan - Reference](#)
- [binaryScan - Frequently Asked Questions](#)

Target
/disk2/home/yiwang/binscan kits/tru64/alpha/filescanner:

```
89  -- Fully Supported
1   -- Available In Migration Environment
7   -- Not Documented On Tru64 UNIX
16  -- Non-critical Change
8   -- Critical Change
0   -- Not Going Forward
0   -- Cluster or AdvFS Related
```

Other Tools

- Transition modules provide information to help you plan and design a transition from HP-UX 11i running on HP 9000 servers to HP-UX 11i v2 running on Intel[®] Itanium[®] 2-based HP Integrity servers.
- ARIES is a binary translator that automatically executes PA-RISC applications on Integrity servers running HP-UX 11i. The ARIES technology does not require recompilation of the code.
- SLPK (Solaris to Linux Porting Kit) and SHPK (Solaris to HP-UX Porting Kit) provides a migration environment to address the compatibility gap between the two platforms at the API and development tools levels. This is used for porting and deployment.

Benefits of Using HP Planning Tools

- **binaryScan** allows you to **quickly** assess the porting effort
- Transition Modules give you the means to **gauge level of effort** and **transition duration**
- **Convenient** and **free** download from the web
- Gives you the opportunity to ask your HP rep for a more detailed **porting assessment report**
- Can be used as a **do-it-yourself** approach or in conjunction with HP Services