



Transitioning your applications from Tru64™ UNIX® to HP-UX™ on Itanium®

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The Alpha RetainTrust program business value through evolution



Business value

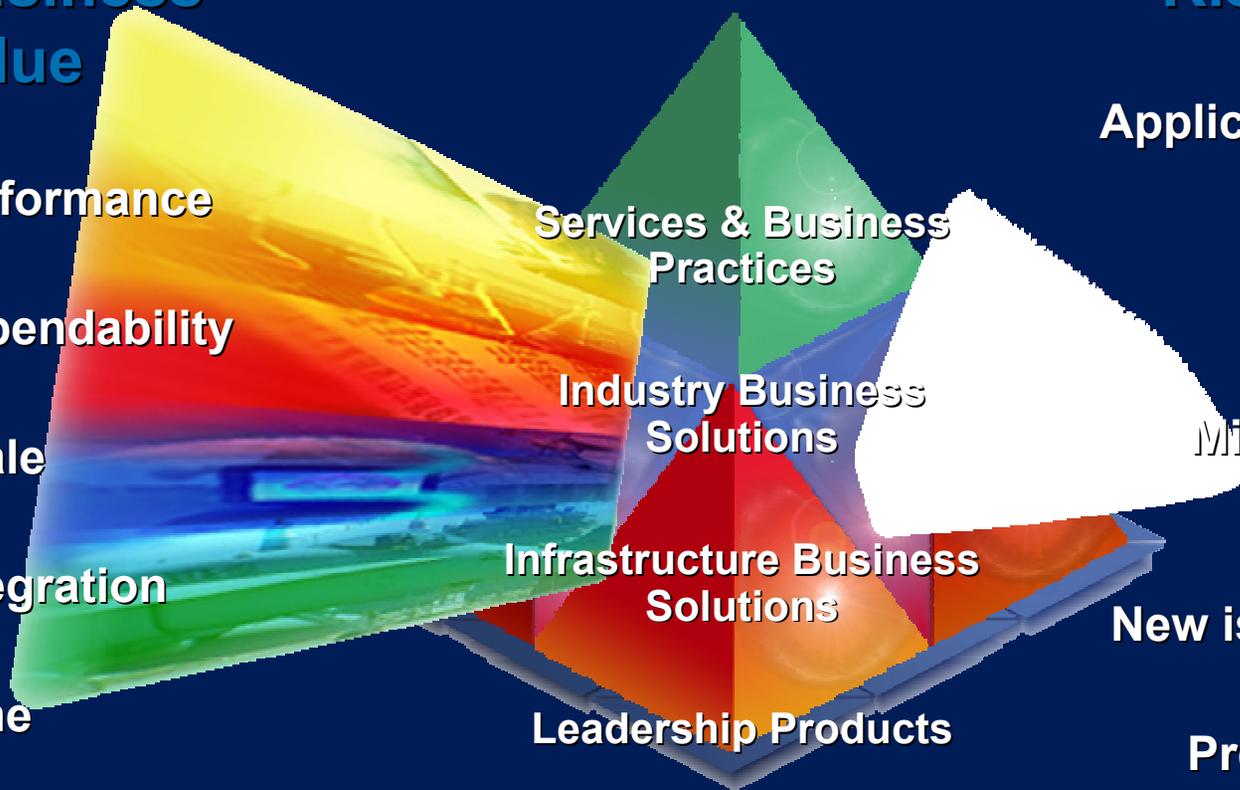
Performance

Dependability

Scale

Integration

Time



Risk mitigation

Application availability

No unplanned downtime

Minimize impact to support staff

New is superset of old

Prove commitment and no forced transition

ART transition programs

- HP is focusing its development effort in the following transition areas:
 - ISV applications
 - Infrastructure
 - Database
 - Custom applications

Custom application transition aids



- Goals

- Facilitate transition of Tru64 UNIX applications onto HP-UX on Itanium-based systems
- Migrated Tru64 UNIX applications become native HP-UX applications

- Tools

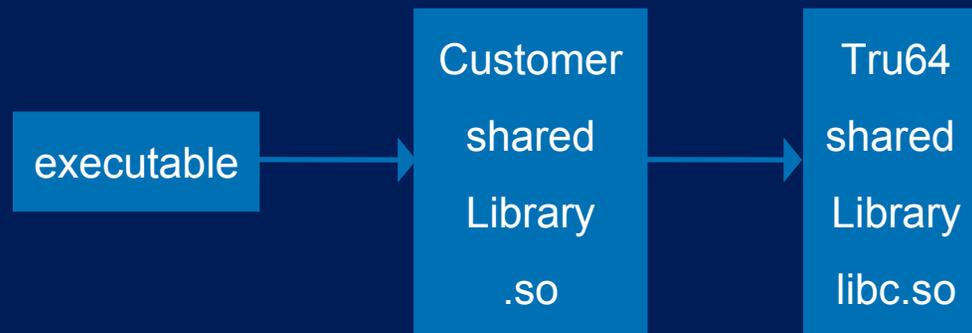
- Planning tool → **appscan**
- Porting tool → **Software Transition Kit**
- Deployment tool → **Migration Environment**

Migration tools module

- appscan V2
- Software Transition Kit for Tru64 UNIX (STK-T)
- Tru64 UNIX Migration Environment for HP-UX
- Tru64 UNIX Compiler Environment for HP-UX

appscan V2

- appscan is a planning tool that will help you scope your porting effort:
 - Will scan a binary and its shared libraries



- Early Adopters Kit on the Web July 03 and on AP CD in Q4/03

appscan V2 output

- Quickly lets you scope the porting effort
- Looks for API's and indicates their disposition on HP-UX
 - Fully supported
 - Code changes possible
 - Code changes required
 - Migration Environment
 - Not going forward (which includes obsolete APIs)
 - Not documented in Tru64 UNIX
 - No Information
 - Not found (Customer API)

appscan V2



- Uses a database to indicate API disposition
 - Includes 124 libraries
 - 10000+ APIs
 - Monthly database updates available on the web
- Functionality exists so that you can scan your binaries and send us the output
 - Helps HP Engineering team focus their efforts

appscan wizard

- The wizard is built on top of appscan.
 - Collects the output from appscan and produces a customized report
 - Prompts for input and allows you to customize the report
 - Allows scanning of multiple files and of directories
 - Quick and easy scoping

appscan V2 example report



```
sward's X desktop (rackem.zk3.dec.com:2)
rackem
File Edit Commands Options Print Help
*****
*
*      APPSCAN WIZARD
*      Report Header
*
*****

Date: Thursday Jul 10 2003 - 04:03:24 PM
  Wizard Version:  appwizard v1.0
  Scanner Version: appscan v2.0 Compaq Tru64 UNIX V5.1A (Rev. 1885)
  Scanner DB Version: appscan database v2.0
  Report Emailed to HP: no
  Report format: Summary
  Default DB:  ./appscanDB_v2.0

Reported Dispositions:
  Fully Supported
  Available in Migration Environment
  Not Documented on Tru64 UNIX
  No Information available.
  Code Change Possible
  Code Change Required
  Not Going Forward

The list of binaries analyzed:
/bin/ksh

*****
*
*      APPSCAN WIZARD
*      Report Summary
*
*****

Count of dispositions analyzed:
 51 -- Fully Supported
  1 -- Available in Migration Environment
 11 -- Not Documented on Tru64 UNIX
  0 -- No Information available.
 36 -- Code Change Possible
  6 -- Code Change Required
  2 -- Not Going Forward
```

Software Transition Kit (STK-T)

- Command line tool, wizard included
- Scans source code files
 - C, C++, makefiles, shell scripts
- scansummary
 - Helpful in scoping the application migration effort
- scandetail
 - Produces a detailed report

*Web kits available since Q3/03
for HP-UX and Tru64 UNIX*

scansummary and scandetail

- Both are wrappers around the filescanner
 - Allows you to select (+) and deselect (-) a multitude of options
 - -s class will group api's by class
 - Examples are Networking, kernel, I/O, Threads
 - +S Cr Includes Critical problems only
 - -S Nc Excludes Non Critical impacts
 - -T En,Ns Excludes Enhancements and Non-standard impacts
 - Allows for a .scanrc configuration file
 - Default file included in kit
 - Can be customized by you

scansummary



sward's X desktop (rackem.zk3.dec.com:2)

Netscape: Tru64 UNIX to HP-UX STK 2.0 scansummary report

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Tru64 UNIX to HP-UX STK 2.0

Thu Jul 10 16:48:01 2003

[identifier type legend](#)
[options used](#)
[interpreting the output report](#)
[faq for scandetail and scansummary](#)

output format:

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

networking

- 4: [F] [fflush - network APIs \(NcWn46\)](#)
- 3: [F] [fopen - network APIs \(NcWn46\)](#)
- 1: [F] [fdopen - network APIs \(NcWn46\)](#)
- 1: [F] [freopen - network APIs \(NcWn46\)](#)
- 1: [F] [getipnodebyname - not documented; use getaddrinfo \(NcCh17\)](#)
- 1: [F] [herror2 - undocumented Tru64 UNIX APIs \(NcOb159\)](#)

kernel

- 9: [F] [chdir - kernel APIs \(NcWn43\)](#)
- 7: [F] [close - kernel APIs \(NcWn43\)](#)
- 5: [F] [unlink - kernel APIs \(NcWn43\)](#)
- 3: [F] [chmod - kernel APIs \(NcWn43\)](#)
- 3: [F] [chown - kernel APIs \(NcWn43\)](#)
- 3: [F] [dup - kernel APIs \(NcWn43\)](#)
- 3: [F] [fstat - kernel APIs \(NcWn43\)](#)
- 3: [F] [ioctl - kernel APIs \(NcWn43\)](#)
- 3: [F] [rmdir - kernel APIs \(NcWn43\)](#)
- 2: [F] [access - kernel APIs \(NcWn43\)](#)
- 2: [F] [lstat - kernel APIs \(NcWn43\)](#)
- 2: [F] [readlink - kernel APIs \(NcWn43\)](#)
- 2: [F] [symlink - kernel APIs \(NcWn43\)](#)
- 1: [F] [creat - kernel APIs \(NcWn43\)](#)
- 1: [F] [mkdir - Tru64 UNIX specific features not supported; future availability planned \(CrCh214\)](#)

scansummary -S Nc



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Netscape: Tru64 UNIX to HP-UX STK 2.0 scansummary report

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Tru64 UNIX to HP-UX STK 2.0

Thu Jul 10 16:52:28 2003

[identifier type legend](#)
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[faq for scandetail and scansummary](#)

output format:

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

kernel

1: [F] [mkdir - Tru64 UNIX specific features not supported; future availability planned \(CrCh214\)](#)

date and time

5: [I] [NLTBMAX - undefined \(CrCh52\)](#)

Tru64 UNIX migration environment

1: * [A] [MAKETOP - not supported; temporarily available \(CrCh122\)](#)
1: [A] [MAKETOP - not supported; temporarily available \(CrCh122\)](#)

I/O issues (file, etc.)

92: [F] [fprintf - printing of NAN and INF values differ \(CrCh137\)](#)
20: [F] [sprintf - printing of NAN and INF values differ \(CrCh137\)](#)
14: [F] [printf - printing of NAN and INF values differ \(CrCh137\)](#)
5: [F] [open - file access permission differences \(CrCh129\)](#)
4: [I] [FILE - incompatible \(CrCh101\)](#)
2: [F] [catgets - incompatible data type; different behavior; Tru64 UNIX specific features not supported \(CrCh18\)](#)
2: [F] [catopen - incompatible data type; different behavior; Tru64 UNIX specific features not supported \(CrCh18\)](#)
2: [M] [st_ldev - some fields not available; future availability planned \(CrCh118\)](#)
1: [F] [creat - file access permission differences \(CrCh129\)](#)

header specific issues

Impact statement



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transition impacts

Tru64 UNIX Software Transition Kit

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critical impact: NLTBMAX – undefined (CrCh52)



problem description

The NLTBMAX constant is defined in the `time.h` header file on Tru64 UNIX, but not on HP-UX.

On Tru64 UNIX, NLTBMAX is the suggested default length of time/date buffer, and is defined to be 64.

identifiers

NLTBMAX

see also

- Background information on [date and time](#) impacts

solution description

Modify your code.

Either replace NLTBMAX with a number (for example, 64) or define the macro as follows:

```
#ifndef NLTBMAX
#define NLTBMAX 64
#endif
```

Legend



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Netscape: Tru64 UNIX to HP-UX STK: Date Impacts Summary

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transition impacts

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date impacts summary



Now that the Year 2000 transition has passed, it is important to continue to handle dates properly in software development. Other date transitions are coming. Software which was quickly patched to survive the Year 2000 transition should be properly repaired. And software shelved during the transition time and later brought back to development may still need to be scanned for problems.

To help you locate date-related problems in your software, the STK may include the following types of impacts:

- **Impacts for APIs that are date-related.** These interfaces indicate that the software is performing date processing, which could cause date-related problems:
 - **For C and C++:** `asctime`, `ctime`, `daylight`, `difftime`, `ftime`, `gettimeofday`, `gmtime`, `localtime`, `mktime`, `settimeofday`, `stime`, `strftime`, `time`, `time_t`, `timeb`, `timeval`, `timezone`, `tm`, `tzname_t`, `tzset`, `execl`, `execvp`, `execve`, `execle`, `execv`, `execvp`, `popen`, `system`
 - **For Fortran:** `CTIME`, `FDATE`, `DATE_AND_TIME`, `IDATE`, `GMTIME`, `LTIME`, `TIME`
 - **For COBOL:** `CURRENT-DATE`, `DATE-OF-INTEGERS`, `WHEN-COMPILED`, `INTEGER-OF-DATE`, `INTEGER-OF-DAY`, `DAY-OF-WEEK`

Many of the Date impacts are warnings, so you miss seeing them if you exclude Non-critical (Nc) or Non-critical Warning (NcWn) impacts from your scans.

In addition to the date-related impacts described above, check your software for other common causes of date-related problems:

- **Less than four digits used to represent years.** Applications that store only the last two digits of the year may not function correctly for dates on or after the year 2000. For example, if dates are compared

Open the address book

Impact statement



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transition impacts
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critical impact:
NLTBMAX – undefined (CrCh52)

problem description

The NLTBMAX constant is defined in the `time.h` header file on Tru64 UNIX, but not on HP-UX.

On Tru64 UNIX, NLTBMAX is the suggested default length of time/date buffer, and is defined to be 64.

identifiers

- NLTBMAX

see also

- [Background information on date and time impacts](#)

solution description

Modify your code.

Either replace NLTBMAX with a number (for example, 64) or define the macro as follows:

```
#ifndef NLTBMAX
#define NLTBMAX 64
#endif
```

Identifier type



The screenshot shows a Netscape browser window titled "Netscape: Tru64 UNIX to HP-UX STK. Description of 'I' Identifier Type". The page content includes the HP logo, a navigation menu on the left, and a main section titled "description of 'I' identifier type". This section contains a table with two columns: "likely cause of overreporting in C or C++ programs" and "recommendation". The first row of the table describes a "Most Common" issue where an identifier does not match any other in the file scanner database. The second row is labeled "Not found".

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identifier Types

hp software transition kit

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description of "I" identifier type

C and C++ miscellaneous identifiers (global variables, type names, enum members or #define macros)

When the identifier type appears on your output report, it indicates that the file scanner recognized the identifier it found as a C or C++ global variable, type name, enum member, or #define macro in C or C++.

likely cause of overreporting in C or C++ programs	recommendation
Most Common: An identifier that does not match any other identifier in the file scanner database, and that is not recognized as user-defined, is assumed to be a C or C++ identifier.	Use <code>-I synopsisID</code> to exclude this impact. You can add the <code>-I</code> option to your <code>.scanrc</code> file.
likely cause of overreporting in Fortran, COBOL, scripts, or makefiles	recommendation
Not found	---

for more information

To obtain information about files that the file scanners classify as "unknown", see Files of Unknown Type.

To use the file scanner options to filter output, see:

- Filtering the Output in "Using scandetail and scansummary"
- scandetail(1)

Critical and links



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transition impacts

Tru64 UNIX Software Transition Kit

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critical impact:
malloc family APIs – header file is mandatory (CrCh96)

`<header>`

problem description

In Tru64 UNIX, the inclusion of a header file is optional for the malloc family of functions, but mandatory in HP-UX.

The `alloca`, `calloc`, `free`, `mallinfo`, `malloc`, `mallocopt`, `realloc`, and `valloc` functions enable applications to allocate memory.

identifiers

`alloca` `free` `malloc` `realloc`
`calloc` `mallinfo` `mallocopt` `valloc`

see also

- Background information on header specific issues impacts
- `alloca(3)`, Tru64 UNIX version
- `calloc(3)`, Tru64 UNIX version
- `free(3)`, Tru64 UNIX version
- `mallinfo(3)`, Tru64 UNIX version
- `malloc(3)`, Tru64 UNIX version
- `mallocopt(3)`, Tru64 UNIX version
- `realloc(3)`, Tru64 UNIX version
- `valloc(3)`, Tru64 UNIX version

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manpage link



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Netscape: malloc(3)

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malloc(3)

NAME

alloca, calloc, free, mallinfo, malloc, mallopt, realloc, valloc - Provide a memory allocator

SYNOPSIS

```
#include <stdlib.h>

void *calloc(
    size_t num_of_elts,
    size_t elt_size );

void free(
    void *pointer );

void *malloc(
    size_t size );

void *realloc(
    void *pointer,
    size_t size );

void *valloc(
    size_t size );
```

The following function definitions do not conform to current standards and are supported only for backward compatibility.

```
char *valloc(
    size_t size );

#include <alloca.h>

void *alloca(
    int size );
```

The following function definitions are provided only for System V compatibility:

```
#include <malloc.h>
```

Critical and links



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- [malloc\(3\)](#), Tru64 UNIX version
- [mallopt\(3\)](#), Tru64 UNIX version
- [realloc\(3\)](#), Tru64 UNIX version
- [valloc\(3\)](#), Tru64 UNIX version

solution description

Include all the required header files. The `alloca` function requires the `<alloca.h>` header file. The `mallopt` and `mallinfo` functions require the `<malloc.h>` header file. The `calloc`, `free`, `malloc`, `realloc`, and `valloc` functions require either the `<stdlib.h>` or `<malloc.h>` header file. Review applicable reference pages and code for more detail.

Users need to include the required header files because of compiler differences between Tru64 UNIX and HP-UX, not the implementations of `malloc`. The Tru64 UNIX compiler automatically recognizes `malloc` and makes sure the return type is a pointer, while the HP-UX compiler does not check specifically for `malloc` calls. Therefore, if the required header files are not included, the compilation will fail on HP-UX.

see also

- [alloca\(3C\)](#), any HP-UX 11i version Version
- [calloc\(3C\)](#), any HP-UX 11i version Version
- [free\(3C\)](#), any HP-UX 11i version Version
- [mallinfo\(3C\)](#), any HP-UX 11i version Version
- [malloc\(3C\)](#), any HP-UX 11i version Version
- [mallopt\(3C\)](#), any HP-UX 11i version Version
- [realloc\(3C\)](#), any HP-UX 11i version Version
- [valloc\(3C\)](#), any HP-UX 11i version Version

problem summary

classifications	source types	OS release	severity	type
HDR	C, C++	N/A	critical	changed

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Netscape: HP-UX Reference

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HP-UX Reference

- Legal Notices
- Revision History
- Conventions
- Preface
- Section 1: User Commands
- Section 1M: Administration Commands
- Section 2: System Calls
- Section 3: Library Functions
- Section 4: File Formats
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↑ HP-UX Reference

↑ Section 3: Library Functions

↑ M

malloc(3C) mbrlen(3C) →

HP-UX 11i Version 1.6: June 2002

System V Synopsis (Hp-Ux)	Description
Return Value	Diagnostics
Errors	External Influences
Warnings	Compatibility
See Also	Standards Conformance

NAME

malloc(), free(), realloc(), calloc(), valloc(), mallopt(), mallinfo(), memorymap(), alloca() – main memory allocator

SYNOPSIS

```
#include <stdlib.h>

void *malloc(size_t size);

void *calloc(size_t nelem, size_t elsize);

void *realloc(void *ptr, size_t size);

void *valloc(size_t size);

void free(void *ptr);

void memorymap(int show_stats); (Obsoleted)
```

alloca

```
#include <alloca.h>

void *alloca(size_t size);
```

↑ SYSTEM V SYNOPSIS (HP-UX)

Non-critical



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transition impacts

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non-critical impact: errno differences – kernel APIs (Nc Wn43)



problem description

All the identified Application Programming Interfaces (APIs) are kernel-related functions on Tru64 UNIX, including system calls. The Tru64 UNIX and HP-UX errno return values for these APIs are different.

This problem is reported if either of the following scenarios exists:

- One or more errno return values on Tru64 UNIX are not found on HP-UX
- The definition of the errno return values on Tru64 UNIX and HP-UX are different

identifiers

Faccept	Ffchdir	Fmadvise	Fsendmsg
Faccess	Ffchmod	Fmknod	Fsendto
Fadjtime	Ffchown	Fmmap	Fsetitimer
Fbind	Ffpathconf	Fmount	Fsetrlimit
Fchdir	Ffstat	Fmsync	Fsetsockopt
Fchmod	Ffstatvfs	Fpipe	Fshmctl
Fchown	Fftruncate	Fpoll	Fshutdown
Fchroot	Fgetfh	Fpread	Fsigstack
Fclose	Fgetgroups	Fputmsg	Fsocket

Code example (old)

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non-critical impact:
getipnodebyname – not documented; use getaddrinfo (NcCh17)



problem description

The `getipnodebyname` function, although available, is not documented on HP-UX.

The `getipnodebyname` function is used to get a network host entry by name for a specific address. This routine is deprecated on Tru64 UNIX and is not documented on HP-UX. A safe replacement is the function `getaddrinfo`.

identifiers

`getipnodebyname`

old behavior

```
int          err;
char        host; /* set to the host name */
static char hostnamebuf [MAXHOSTNAMELEN];
struct hostent *hp;
struct sockaddr_in sockAddr;

bzero((char *)&sockAddr, sizeof (sockAddr));

if( (hp = getipnodebyname(host, AF_INET, AI_DEFAULT, &err)) != NULL ) {
sockAddr.sin_family = hp->h_addrtype;
bcopy(hp->h_addr_list[0], (caddr_t)&sockAddr.sin_addr, hp->h_length);
(void) strncpy(hostnamebuf, hp->h_name, sizeof(hostnamebuf));
}
```

see also

- Background information on [networking impacts](#)
- [getaddrinfo\(3\)](#), Tru64 UNIX version
- [getipnodebyname\(3\)](#), Tru64 UNIX version

100%

Code example (new)



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Netscape: Tru64 UNIX Software Transistion Kit

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solution description

Although the `getipnodebyname` function is available on HP-UX, it may be safer to use `getaddrinfo` to achieve similar results.

Replace calls to `getipnodebyname` with `getaddrinfo`. Note that `getaddrinfo` does not behave exactly the same as `getipnodebyname`. Review your code and the applicable reference pages for more information.

new behavior

```
char                *host; /* set to the host name */
static char        hostnamebuf [MAXHOSTNAMELEN];
struct addrinfo    *ai= NULL;
struct addrinfo    hints;
struct sockaddr_in sockAddr;
...

bzero( (char *)&sockAddr, sizeof (sockAddr) );
bzero( &hints, sizeof(struct addrinfo) );
hints.ai_flags = AI_DEFAULT|AI_CANONNAME;
hints.ai_family = AF_INET;

if( getaddrinfo( host, NULL, &hints, &ai ) == 0 ) {
sockAddr = *(struct sockaddr_in*)ai->ai_addr;
(void)strncpy( hostnamebuf, ai->ai_canonname, sizeof(hostnamebuf) );
}
...
freeaddrinfo( ai );
```

see also

- [getaddrinfo\(3N\)](#), any HP-UX 11i version Version

problem summary

classifications	source types	OS release	severity	type
NW	C, C++	N/A	non-critical	changed

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Signal (problem)



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critical impact: signal function – behavior difference (CrCh18)



problem description

The behavior for the `signal` function is different on Tru64 UNIX and HP-UX.

HP-UX follows the traditional System V unreliable signal behavior. This differs from the default Tru64 UNIX behavior in the following ways:

- On HP-UX, just before the signal handler is invoked, the action for the signal is reset to `SIG_DFL`. On Tru64 UNIX, the action is not reset. As a result, only the first signal is caught on HP-UX. Depending on the signal's default action, later signals are either ignored or terminate the process.
- On HP-UX, while the signal handler is executing, other occurrences of the signal are not blocked. On Tru64 UNIX, the other occurrences are blocked. Because of this, you cannot solve the first problem by adding the following statement to the beginning of the signal handler:

```
signal(sig, sighandler);
```

There is a small window between when the signal handler is invoked and when the statement is actually executed when a second signal could arrive. That signal would trigger the default action and thus either be ignored or terminate the process.

When an application is built in the System V Habitat on Tru64 UNIX, `signal` follows the HP-UX behavior.

identifiers

signal

see also

- Background information on signal specific issues impacts
- `sigaction(2)`, Tru64 UNIX version
- `signal(2)`, Tru64 UNIX version
- `standards(5)`, Tru64 UNIX version

solution description

Signal (solution)



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Netscape: HP's software transition kit

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When an application is built in the System V Habitat on Tru64 UNIX, `signal` follows the HP-UX behavior.

identifiers

`signal`

see also

- Background information on [signal specific issues](#) impacts
- [sigaction\(2\)](#)
- [signal\(2\)](#)
- [standards\(5\)](#)

solution description

Use the `sigaction` function.

new behavior

```
struct sigaction sa;  
sa.sa_handler = handler;  
sigemptyset(&sa.sa_mask);  
sa.sa_flags = 0;  
if (sigaction(SIGCHLD, &sa, NULL) < 0)  
perror("sigaction");
```

see also

- [sigaction\(2\)](#)
- [signal\(2\)](#)

problem summary

classifications	source types	OS release	severity	type
SIG	C, C++	N/A	critical	changed

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Migration Environment



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critical impact:

mktemp, mkstemp, mkdtemp, mkstemp – different implementation and support; temporarily available (CrCh215)



problem description

The `mktemp` and `mkstemp` functions exist on Tru64 UNIX and HP-UX. They have identical argument inputs and return types; however, the Tru64 UNIX version is less susceptible to interference by other users in the system. `mkdtemp` and `mkstemp` only exist on Tru64 UNIX. All four APIs are provided on a temporary basis in the Tru64 UNIX Migration Environment on HP-UX.

`mktemp` replaces the string pointed to by the template argument, with a unique file name.

`mkstemp` performs the same task as `mktemp`, but returns a file descriptor for the unique file and also opens the file with a read/write privilege.

`mkdtemp` generates a uniquely named temporary directory with permission 0700 from the template argument.

`mkstemp` is similar to `mkstemp`, but it permits the inclusion of a trailing suffix in the template argument string.

identifiers

`mkdtemp` `mkstemp` `mkstemp` `mktemp`

see also

- Background information on [security related issues](#) impacts
- [mktemp\(3\)](#), Tru64 UNIX version

solution description

The Tru64 UNIX `mktemp`, `mkstemp`, `mkdtemp`, and `mkstemp` will be put into the migration environment.

The Tru64 UNIX `mktemp`, `mkstemp`, `mkdtemp`, and `mkstemp` functions will be provided in the `libtru64.so` library in the Tru64 UNIX Migration Environment on HP-UX. Please note that the Migration Environment is temporary.

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non-critical impact: ksh – functional differences (NcCh126)



problem description

There are several functional differences between the Korn shell (ksh) on Tru64 UNIX, which is functionally equivalent to the POSIX shell, and standard shell (ksh) on HP-UX.

Examples of functional differences include support of the \$USER environment variable; varying levels of support for internationalized range expressions; and varying name limits.

identifiers

ksh

see also

- Background information on [command and utilities](#) impacts
- [ksh\(1\)](#), Tru64 UNIX version

solution description

Because the ksh supplies a rich set of functionality, details on differences between the two implementations and recommendations for resolving differences are described in the White Paper, *Analysis of Shells for Tru64 UNIX and HP-UX*.

see also

- [ksh\(1\)](#), any HP-UX 11i version Version
- [Migrating from Tru64 UNIX to HP-UX Shells](#)

problem summary

classifications	source types	OS release	severity	type
CMD	Script	N/A	non-critical	changed

make



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critical impact:

/usr/bin/make – not supported; temporarily available (CrCh122)



problem description

The /usr/bin/make utility exists only on Tru64 UNIX and not on HP-UX. This utility will be temporarily available in the Tru64 UNIX Migration Environment on HP-UX. There are multiple versions of the make utility available on Tru64 UNIX. This version of the usr/bin/make utility will be the only one ported.

The make utility maintains up-to-date versions of target files and performs shell commands.

The Migration Environment is a compatibility layer that contains Tru64 UNIX APIs, development tools, and commands and utilities to assist customers in migrating their applications from Tru64 UNIX to HP-UX.

identifiers

.EXIT	make	SHELL
.INIT	MAKECWD	SOURCEDIR
.INOBJECTDIR	MAKEDIR	TARGET_MACHINE
ARCHIVE_FORMAT	MAKEPSD	target_machine
MACHINE	MAKETOP	

see also

- Background information on [Tru64 UNIX migration environment impacts](#)
- [make\(1P\)](#), Tru64 UNIX version

solution description

The /usr/bin/make utility is in the Tru64 UNIX Migration Environment on HP-UX.

Applications will be able to use this utility from the Migration Environment. Please note that the Migration Environment is temporary. The Tru64 UNIX /usr/bin/make functionality is being considered, but is not yet committed for a future release of HP-UX.

For a detailed description of the differences between the native Tru64 UNIX version

scandetail



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Netscape: Tru64 UNIX to HP-UX STK 2.0 scandetail report

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Tru64 UNIX to HP-UX STK 2.0

Thu Jul 10 17:51:31 2003

[identifier type legend](#)
[options used](#)
[interpreting the output report](#)
[faq for scandetail and scansummary](#)

output format:

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

[code/Makefile:35:](#) [A] [MAKETOP - not supported; temporarily available \(CrCh122\)](#)
[code/Makefile:48:](#) * [A] [MAKETOP - not supported; temporarily available \(CrCh122\)](#)

[code/app:2:](#) * [C] [ksh - functional differences \(NcCh126\)](#)
[code/app:4:](#) * [C] [ls - implementation differences \(CrEn150\)](#)
[code/app:6:](#) * [C] [ls - implementation differences \(CrEn150\)](#)

[code/ls.c:282:](#) [F] [catgets - incompatible data type; different behavior; Tru64 UNIX specific features not supported](#)
[code/ls.c:473:](#) [F] [catopen - incompatible data type; different behavior; Tru64 UNIX specific features not supported](#)
[code/ls.c:486:](#) [F] [time - different errno \(NcWn28\)](#)
[code/ls.c:491:](#) [F] [getipnodebyname - not documented; use getaddrinfo \(NcCh17\)](#)
[code/ls.c:493:](#) [F] [herror2 - undocumented Tru64 UNIX APIs \(NcOb159\)](#)
[code/ls.c:497:](#) [F] [isatty - different behavior \(NcWn65\)](#)
[code/ls.c:606:](#) [F] [fprintf - printing of NAN and INF values differ \(CrCh137\)](#)
[code/ls.c:607:](#) * [C] [ls - implementation differences \(CrEn150\)](#)
[code/ls.c:649:](#) [F] [atoi - miscellaneous APIs \(NcWn44\)](#)
[code/ls.c:652:](#) [F] [ioctl - kernel APIs \(NcWn43\)](#)
[code/ls.c:652:](#) [F] [ioctl - I/O functions \(NcWn50\)](#)
[code/ls.c:664:](#) [F] [malloc - header file is mandatory \(CrCh96\)](#)
[code/ls.c:664:](#) [F] [malloc - miscellaneous APIs \(NcWn44\)](#)
[code/ls.c:666:](#) [F] [malloc - header file is mandatory \(CrCh96\)](#)
[code/ls.c:666:](#) [F] [malloc - miscellaneous APIs \(NcWn44\)](#)
[code/ls.c:668:](#) [F] [fprintf - printing of NAN and INF values differ \(CrCh137\)](#)
[code/ls.c:683:](#) [F] [mbswidth - undocumented Tru64 UNIX APIs \(NcOb158\)](#)
[code/ls.c:724:](#) [F] [free - header file is mandatory \(CrCh96\)](#)
[code/ls.c:725:](#) [F] [free - header file is mandatory \(CrCh96\)](#)
[code/ls.c:782:](#) [F] [calloc - header file is mandatory \(CrCh96\)](#)
[code/ls.c:784:](#) [F] [fprintf - printing of NAN and INF values differ \(CrCh137\)](#)

Document Done

scandetail with -s synopsis



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Netscape: Tru64 UNIX to HP-UX STK 2.0 scandetail report

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Tru64 UNIX to HP-UX STK 2.0

Thu Jul 10 17:53:39 2003

[identifier type legend](#)
[options used](#)
[interpreting the output report](#)
[faq for scandetail and scansummary](#)

output format:
problem severity/problem type Impacts
synopsis (synopsis ID)
file name:line number: (Identifier type) identifier

critical changed Impacts

[index, rindex - different header file \(CrCh8\)](#)

[code/tar.c:869:](#) [F] rindex
[code/tar.c:1475:](#) [F] rindex
[code/tar.c:1883:](#) [F] rindex

[signal function - behavior difference \(CrCh18\)](#)

[code/tar.c:678:](#) [F] signal
[code/tar.c:679:](#) [F] signal
[code/tar.c:680:](#) [F] signal
[code/tar.c:681:](#) [F] signal
[code/tar.c:682:](#) [F] signal
[code/tar.c:683:](#) [F] signal
[code/tar.c:684:](#) [F] signal
[code/tar.c:685:](#) [F] signal
[code/tar.c:1925:](#) [F] signal
[code/tar.c:1931:](#) [F] signal
[code/tar.c:1937:](#) [F] signal
[code/tar.c:1943:](#) [F] signal

[NLTBMAX - undefined \(CrCh52\)](#)

scandetail with editor



The screenshot shows a Netscape browser window titled "Netscape: Tru64 UNIX to HP-UX STK 2.0 scandetail report". The browser's address bar shows "sward's X desktop (rackem.zk3.dec.com:2)". The main content area displays the HP logo and the text "Tru64 UNIX to HP-UX STK 2.0 scandetail report". Below this, there is a date "Thu Jul 10 17:53:39 2003" and several links: "identifier type legend", "options used", "interpreting the output report", and "faq for scandetail and scansummary".

On the left side of the browser window, there is a sidebar with the following sections:

- output format:**
- problem severity/problem type**
- synopsis (synopsis ID)**
- file name:line number: (Identifier)**
- critical changed Impacts**
- index, rindex - different h**
- code/tar.c:869:** rindex
- code/tar.c:1475:** rindex
- code/tar.c:1883:** rindex
- signal function - behavior difference (CrCh18)**
- code/tar.c:678:** signal
- code/tar.c:679:** signal
- code/tar.c:680:** signal
- code/tar.c:681:** signal
- code/tar.c:682:** signal
- code/tar.c:683:** signal
- code/tar.c:684:** signal
- code/tar.c:685:** signal
- code/tar.c:1925:** signal
- code/tar.c:1931:** signal
- code/tar.c:1937:** signal
- code/tar.c:1943:** signal
- NLTBMX - undefined (CrCh52)**

An "dtterm" window is overlaid on the browser, showing a C code snippet:

```
if (skip && **argv != '/') {
    /*
     * This arg was meant to apply relative to a current
     * directory set by "-C <dir>", but the chdir() failed.
     */
    argv++;
    continue;
}

parent = wdir;
cp2 = rindex(*argv, '/');
if (!cp2) /* pathname consists only of filename*/
    cp2 = *argv;
else if (cp2 != *argv) { /* there is a path prefix */
    *cp2 = '\0';
    if (chdir(*argv) < 0) {
        fprintf(stderr, MSGSTR(ECHDIR,
            "tar: can't change directories to "));
        perror(*argv);
        continue;
    }
    *cp2 = '/';
    cp2++;
}
"tar.c" [Read only] 2844 lines, 65112 characters
```

scanwizard



scanwizard is built on top of the filescanner utility

- The filescanner has the potential of doing over-scanning and producing very long reports.
- scanwizard is a non-GUI interactive utility (a wizard) to make it easier for casual users of the filescanner to obtain customized and specific reports.
- Allows the casual user to become familiar with the tool

scanwizard (cont.)



- scanwizard will prompt you and save the answers in a file
- Allows you to do summary or full reports
- Allows you to select or deselect severity, classes etc

Tru64 UNIX Migration Environment



- Compatibility layer for Tru64 UNIX APIs, development tools and commands/utilities on HP-UX
 - Assists you in migrating Tru64 UNIX applications rapidly, in their move towards becoming native HP-UX applications
 - Expected to be integrated in future versions of HP-UX for better compatibility

Tru64 UNIX Migration Environment (cont.)



- Delivery Vehicles

- Web access (<http://www.hp.com/go/tru64appmigration>) in Q3/03
- As an ISU (Independent Software Unit) for HP-UX 11i V3

- Expected life of the Tru64 UNIX Migration Environment is through the supported lifetime of Alpha

Tru64 UNIX Migration Environment (cont.)



Migration Environment contains utilities and libraries

- Utilities and commands
 - Tru64 UNIX make
 - Tru64 UNIX cc, cxx, ld wrappers
 - Tru64 UNIX mkcatdefs
 - Tru64 UNIX dspcat
 - Tru64 UNIX dspmsg
 - Tru64 UNIX mcs
 - Tru64 UNIX tar
 - Tru64 UNIX cpio
 - Tru64 UNIX pax
 - HP-UX stty (Modified to add -dec)

Migration environment libraries



- **libtru64.so**
 - Contains APIs intended to become native on HP-UX
 - safe_open, mkstemp, mkdtemp, mkstemp
 - flock, memctrl

- **libtru64_ext.a**
 - Static library that contains APIs that will NOT move forward to HP-UX
 - TIS APIs
 - Use the threads libraries on HP-UX
 - sigvec, sigsetmask, sigblock
 - Use POSIX routines on HP-UX

Compilation environment



- Incompatibility areas:
 - Makefiles
 - Compiler switches
 - Language dialect differences

Compilation environment compatibility strategy



- Tru64 UNIX makefiles and compiler switches on HP-UX
- Provide Tru64 UNIX make
- Provide compiler & linker jackets
 - Map command line flags from Tru64 UNIX syntax to HP-UX syntax where there is a match
 - Deliver through Tru64 UNIX Migration Environment and as separate components on the Web

Compilation environment compatibility strategy (cont.)



- make
 - Make will run on HP-UX 11i V1.6 and higher
 - Default Tru64 UNIX make (/usr/ccs/bin/make)
 - Uses native HP utilities

Compilation environment compatibility strategy (cont.)



- cc and cxx jacket
 - The cc jacket translates Tru64 UNIX compiler command line to HP-UX compiler command line and executes it.
 - It can also be used to port makefiles and scripts to HP-UX by reporting translations for Tru64 UNIX cc commands.

Compilation environment compatibility strategy (cont.)



- Id jacket
 - The Id jacket translates Tru64 UNIX link command line to HP-UX command line and executes it.
 - It can also be used to port makefiles and scripts to HP-UX by reporting translations for Tru64 UNIX Id commands.

cc -port_command example



```
% cc -port_command -call_shared himom.c -lc
```

```
/opt/aCC/bin/aCC -I/opt/tru64/include +Olibmerrno  
+Onofltacc -fpeval=float -O1 +Olit=none -Ae  
+DD64 -c himom.c
```

```
/usr/ccs/bin/ld -dynamic +nodefaulttrpath  
+Onoprocelim -z -L /opt/aCC/lib/hpux64 +b  
/opt/tru64/lib/hpux64:/usr/lib/hpux64 -E himom.o  
/opt/tru64/lib/hpux64/libtru64.so  
/opt/tru64/lib/hpux64/libtru64_ext.a -lc +FPiuOZV  
-lc
```

Compilation environment compatibility strategy (cont.)



- Dialect differences
- Short term: before HP-UX 11i v3
 - Document major issues
 - Opportunistically remove some of the biggest roadblocks, e.g.,
 - parameter passing and return values for code without prototypes.
- HP-UX 11i v3 and on
 - New C, C++, FORTRAN compilers on HP-UX with a much higher degree of dialect compatibility.
 - The goal is NOT recompile and go. There will still be some amount of dialect incompatibility.

User documentation

- Compatibility and Usage Guides
 - White Papers
 - Best Practices
 - “wdb for Ladebug users” Usage Guide
 - “Caliper for DCPI users” Usage Guide
- Package man pages for single point accessibility
 - Tru64 UNIX and HP-UX man pages
- Porting guide

Tru64 UNIX application transition roadmap

Discovering the new development environment

- Porting guides
- White papers
- Architectural workshops
- Consultancy workshops

Tru64 UNIX to HP-UX tools

- Migration Environment on HP-UX 11i v2
- Software Transition Kit
- More migration usage guides
- Updated on a regular basis

..... ◆ 2002 —◆— 2003 —◆— 2004 —◆—

Early planning tools

- Scoping tool (appscan)
- Best practice documents
- Tru64 UNIX & HP-UX man pages
- Migration usage guides

Integrated tools into HP-UX

- Enhanced planning tools
- Migration Environment on HP-UX 11i v3
- Updated documentation

Case study (FMS)



- Fraud Management System
 - 600000 lines of code
 - C and C++ code
 - Shell scripts
 - Pro*C™ (Embedded SQL)
 - Oracle® database build scripts
 - third-party products
 - CLIPS and ormiORB
- This took 10 weeks for 2 people to complete

Pilot port program



- Goals for the program:
 - To gain insight into your environment and the issues that you may have while transitioning to HP-UX
 - To guide you through an agreed upon part of the transition and demonstrate how helpful HP's methodology, services, and tools are
- appscan is a key tool for the program
 - Download appscan at <http://www.hp.com/go/tru64appmigration>
 - Please send the appscan output back to us
- Contact us at Tru64-AMtools@hp.com if you are interested in participating in the pilot program

Testdrive



- The Application Transition Tools are available on our testdrive site
<http://www.testdrive.hp.com/tools/>.

Resources



- Tru64 UNIX to HP-UX Application Transition site:
<http://www.hp.com/go/tru64appmigration/>
- Tru64 UNIX to HP-UX Application Transition success stories:
http://h30097.www3.hp.com/transition/apps/port_models.html
- Tru64 UNIX to HP-UX Porting Guide:
http://h30097.www3.hp.com/transition/apps/porting_guide.html
- HP Software Transition Kit site: <http://devrsrc1.external.hp.com/STK/>
- HP Developer and Solution Partner Program site:
<http://h21007.www2.hp.com/>
- Tru64 UNIX to HP-UX Transition site:
<http://www.hp.com/go/tru64transition/>
- HP Alpha RetainTrust site:
<http://www.hp.com/go/alpha-retaintrust>



i n v e n t