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Presentation Title: Tips, Tricks on getting OpenServer 5, UnixWare and SCO Xenix applications running on SCO OpenServer 6

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Session ID: 140

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Session Objectives



- At the end of this session you will:
 - Know what ABIs and Development Tools are provided as part of OpenServer 6
 - Understand how to use SCOMPAT and chsysinfo(ADM) to install legacy applications
 - Be aware of known issues with OpenServer 5, UnixWare 7 and Xenix applications on OpenServer 6
 - Understand how to debug problems with legacy applications on OpenServer 6
 - Know where to go for further assistance and support



- The OpenServer 6 kernel is an SVR5 kernel
 - This kernel can handle
 - SVR5 system calls
 - OpenServer 5 (OSR5) system calls
 - This kernel does not support OSR5 driver(s)
- OpenServer 6 Application Binary Interfaces:
 - SVR5 ABI
 - OpenServer 5 ABI
- OpenServer 6 System Libraries:
 - SVR5 Libraries
 - OpenServer 5 Libraries



- The SVR5 ABI and Development Tools
 - Default OpenServer 6 ABI
 - Used to rebuild/link the kernel
 - Libraries are located in
 - **/usr/lib** and **/usr/ccs/lib**
 - Development Tools are found in
 - **/usr/ccs/bin** or **/usr/bin** (links)
 - Headers are found in
 - **/usr/include**
 - Default compiler switch is **-K udk**



- The OSR ABI and Development Tools
 - Libraries are located in
 - **/osr5/usr/lib** and **/osr5/usr/ccs/lib**
 - Development Tools are found in
 - **/osr5/usr/ccs/bin** or **/osr5/usr/bin** (links)
 - Headers are found in
 - **/osr5/usr/include**
 - Default compiler switch is **-K osr5**
 - Install OpenServer 6 Development system to get:
 - All SVR5 and OSR5 Headers
 - Commands like C++, memtool, debug etc



- Use the SVR5 Development Tools:
 - To modernise existing OpenServer applications
 - To develop Device Drivers
 - To create Single Certification apps
 - To develop new applications
- Use the OSR Development Tools:
 - To create apps that need binary compatibility with existing OSR5 .o, .a or .so objects

OpenServer 6 Command Overview



- Significantly different Kernel build tools
 - May cause issues if application uses the link kit
- Various command directory paths:
 - **/bin**
 - traditional OSR5 user
 - **/u95/bin:/bin**
 - traditional OSR5 user who want Large File Support
 - **/udk/bin:/u95/bin:/bin**
 - users running a UW7 application
- all of these play into the issues and resolutions described later in this session

Install, SCOMPAT & chsysinfo(ADM) [1]



- For applications that perform an Operating System check at install/run time use
 - SCOMPAT or
 - chsysinfo(ADM)
- SCOMPAT Environment Variable
 - Affects the return value of uname(C) for the current process and children only
 - Less “severe” than chsysinfo(ADM)
 - Syntax is:
 - SCOMPAT=***release: version[: sysname[: Xrelease]]***



- **chsysinfo(ADM):**
 - Should only be used during application installation
 - Affects return values system wide
 - **confstr(S), sysinfo(S), and uname(S)**
 - Can change return values of system name, version and release using options:
 - **osr5 | osr6 | uw7 | ou8 | default**
 - Warning: Should be used sparingly
 - Always return to default using:
 - **chsysinfo default**



- First, set your path to:
 - **/osr5/usr/bin:\$PATH**
- Console Issues:
 - Usually caused by poorly written applications
 - Before MP2 the console emulation was at386-ie
 - MP2 provides an ansi emulation
- xmodmap:
 - Keycodes returned by OpenServer 6 are OpenServer 5 Keycodes +1



- Xenix Emulation - xemul(C):
 - Some OpenServer 5 apps use the Xenix emulator
 - XEMUL_OSR5 environment variable
 - XEMUL_TRACE environment variable
 - xemul(C) does not support
 - Xenix shared memory
 - Mandatory file locking
 - Device **ioctl** commands
 - File limit of 60 open files removed by MP2
 - OSS706a has fixes for:
 - dup2(S) and rdchk(S)
 - chsize(S) fixes for Microsoft Basic/ISAM applications



- If you are performing maintenance of existing OpenServer 5 application, use the OSR5 ABI compilation tools
- Maintenance Pack 2 networking fixes:
 - **TCP *send()*: When *tcpsend()* blocks for any condition, it returns EAGAIN instead of EWOULDBLOCK (ID: 533307:1)**



- OpenServer 5 object file format
 - Default: COFF Optional: ELF
- OpenServer 6 object file format
 - Only produces ELF
 - Understands COFF objects
 - Internally converts to ELF before using
 - “nag” warnings when internal conversion occurs
- `cof2elf(CP)` converts COFF object (.o) and archives (.a) to ELF format



- Some applications:
 - Attempt to tune the kernel at install time
 - Provide recommended settings for tunables
- SCOs recommendations are:
 - There should be no need to tune NBUF, NHBUF, NMPBUF.
 - For OpenServer 6 equivalents of OSR507 tunables see:
 - http://osr600doc.sco.com/en/SM_perform/osr507kerntuns.html
 - Don't blindly tune OpenServer 6 kernel tunables



- First, set your path to:
 - **/udk/bin:/u95/bin:\$PATH**
- No known issues
- The OpenServer 6 Java is a Single Certification application built on UnixWare 7
- Many 3rd parties have built on UnixWare 7 and certified on OpenServer 6 including:
 - fpTechnology (filepro 5.6)
 - Progress (OpenEdge 10)
 - Ingres - (Ingres r3)



- Xenix Emulation - xemul(C):
 - This emulator of the SVR5 Kernel Xenix Emulator
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- Informix
 - Symptom: Informix connections fail with
 - "25519 The sqlxecd daemon cannot open the network device."
 - Solution:
 - Apply MP2 as it fixes issue fz533449
 - Symptom: numerous warnings – "internal conversion of COFF to ELF"
 - Solution:
 - Run cof2elf on all object (.o) and archives (.a)



- Informix SE 7.23 and Informix 4GL 7.20
 - Symptom: Informix 4GL fails to install
 - Solution:
 - Install the SCO OpenServer 6 Development System
 - Prefix you PATH setting with **/osr5/bin**
 - e.g. **PATH=/osr5/bin:\$PATH; export PATH**
 - Edit the install script called **\$INFORMIXDIR/bin/c4gl**
 - Change line
 - from: **TLILIB=/usr/lib/libnsl_s.a**
 - to: **TLILIB=/osr5/usr/lib/libnsl.so**
 - Modify link command option
 - from: **-lnsl_s**
 - to: **-lnsl**



- Oracle 7.1.6
 - SCO ODT 3.2 Unix – revamped for OSR 5
 - Uses idbuild tools to compile and link
 - Provided own runtime (o?????.o)
 - Layered runtime, script and makefile changes over image
- Oracle 7.2.x
 - Using idbuild tools for basic parts
- Oracle 7.3.x
 - Idbuild tools and cc
 - Used native runtime



- Eliminate usage of idbuild tools
 - **/bin/idcomp** → **/osr5/usr/ccs/bin/cc**
 - **/bin/idld** → **/osr5/usr/ccs/bin/cc** (native RT)
→ **/osr5/usr/ccs/ld** (Oracle C RT)
 - **/bin/idas** → **/osr5/usr/ccs/bin/as**
 - **/bin/idar** → **/bin/ar**
 - **/lib/cpp** → eliminate usage
- Compilation sequences
 - was: **/lib/idcpp** → **/bin/idcomp** → **/bin/idas**
 - now: **/osr5/usr/ccs/bin/cc -c**

Application specific issues : Oracle [3]



- Run `cof2elf (C)` command on `.o` and `.a`
- `/dev/sleeper (postwait)` driver to be released in September
 - Disable `postwait` option in configuration until patch is installed
- (Re)Installing from Oracle media
 - Most files in compressed format



- FoxBase, FoxBase+ and FoxPro
 - Symptom: Application fails with
 - "File Write error".
 - Solution:
 - Edit the Foxbase, Foxbase+ or FoxPro Database startup script and add the following lines to the start of the script:
 - XEMUL_OSR5=1
 - export XEMUL_OSR5
 - Symptom: Application fails with
 - "Number of Locks has reached system maximum"
 - Solution:
 - Increase the FLCKREC kernel tunable

Debugging application failures [1]



- Use truss(C) to determine cause of failing system calls:
 - `truss -f -o truss.out <my_app_or_script>`
- COREFILE_PIDS – kernel tuneable
 - =0
 - Produces a single “core” file in a directory
 - Existing “core” file suppresses subsequent core dumps in that directory
 - =1
 - Produces core files with name of “core.<pid>”
- SCORLIM & HCORLIM
 - Soft and hard core size limits - kernel tuneables
 - Value are in number of bytes
- User control
 - `ulimit -c <value expressed 500K byte blocks>`



- Collecting Xenix emulation trace information
 - `XEMUL_TRACE=1; export XEMUL_TRACE`
 - Run the Xenix application
 - Trace file: `xtrace.<pid>`
- Core files
 - Use `file (C)` command to determine what application
 - Use `debug (CP)` command to check for completeness
 - `debug -ic -c <corefile>`



- Getting More help:
 - Apply the latest Maintenance Pack first
 - Check the Support Knowledge Base at:
 - <http://www.sco.com/ta>
 - osr5to6@sco.com
 - legend@list.sco.com
 - To join send email to legend_subscribe@list.sco.com

Questions?



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