



**i n v e n t**



# ia-32 on ia-64

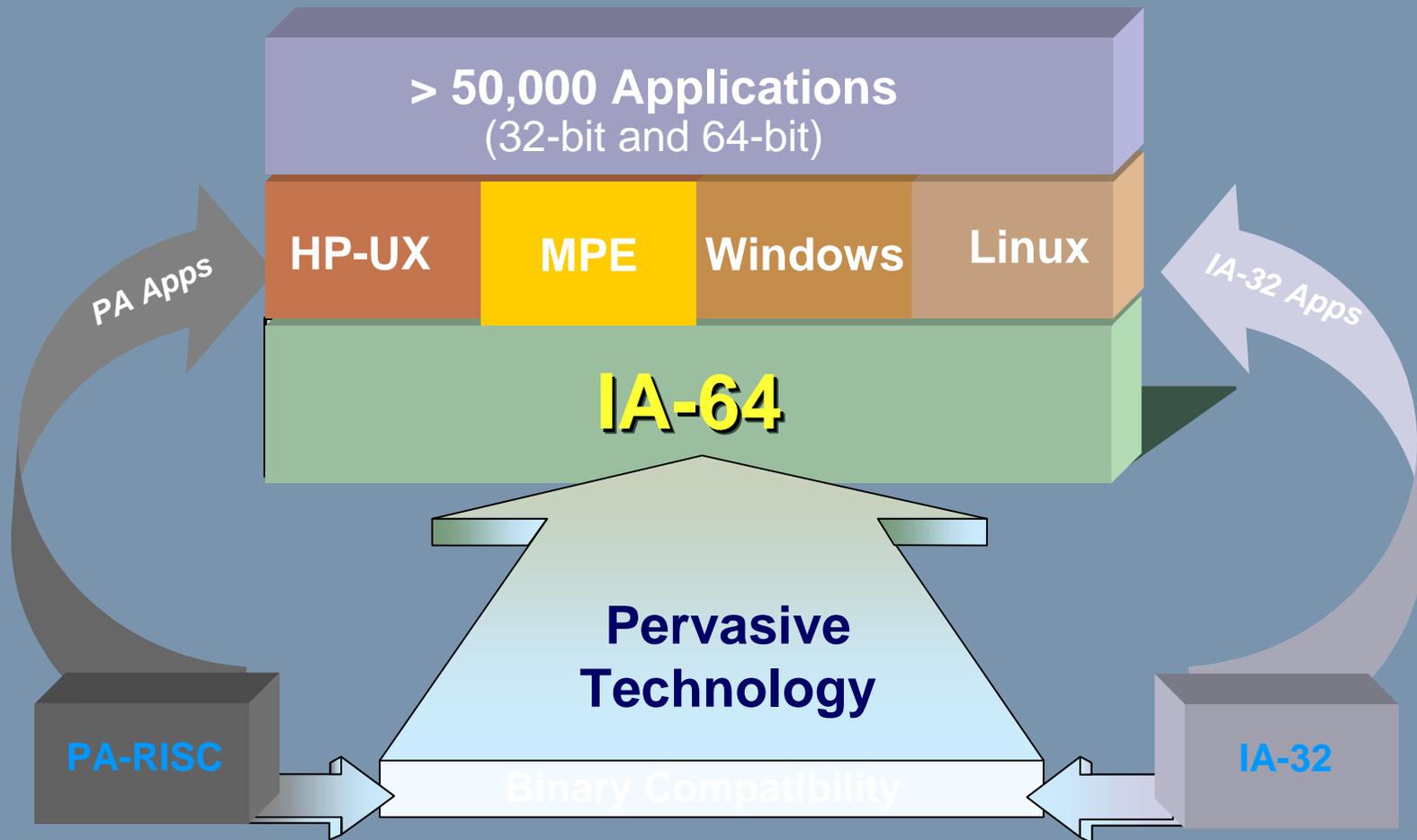
Leveraging your applications

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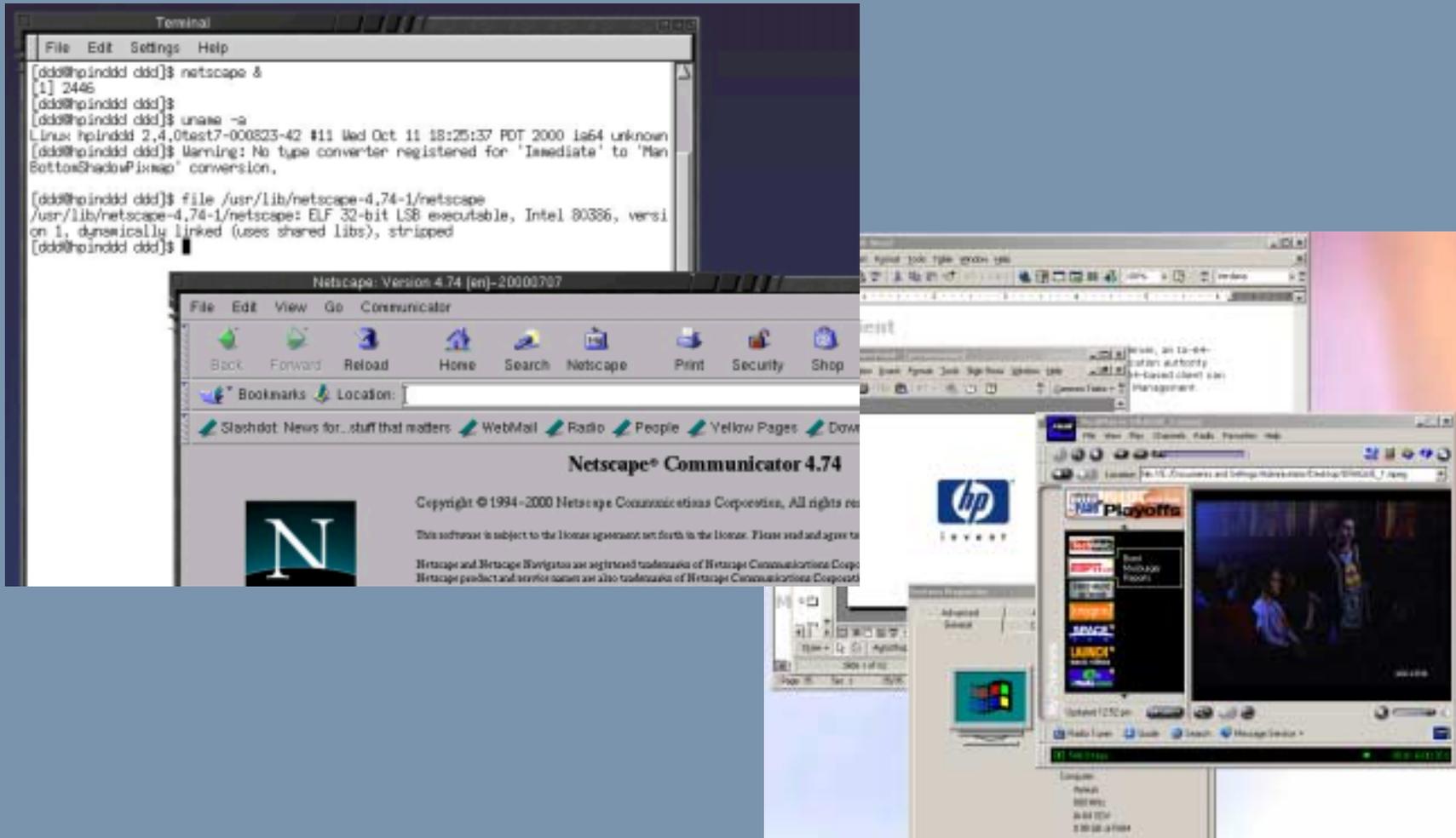
## why run ia-32 code on ia-64? applications don't improve automatically on ia-64

- Office applications: limited largely by user speed
- Utilities, file transfer, anti-virus: limited by I/O or network speed
- Freeware, shareware: Individuals won't buy an ia-64
  - These applications will remain ia-32 binaries for a long time
- Sweetspots for ia-64: floating-point, multimedia, large data sets

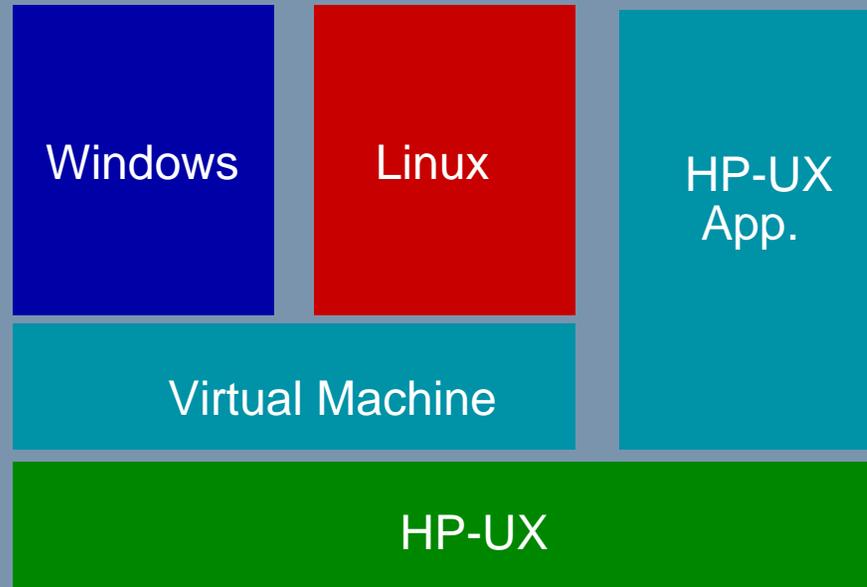
why run ia-32 code on ia-64?  
ia-64 offers the largest applications portfolio



# how do I run ia-32 apps on ia-64? transparent process on Windows and Linux

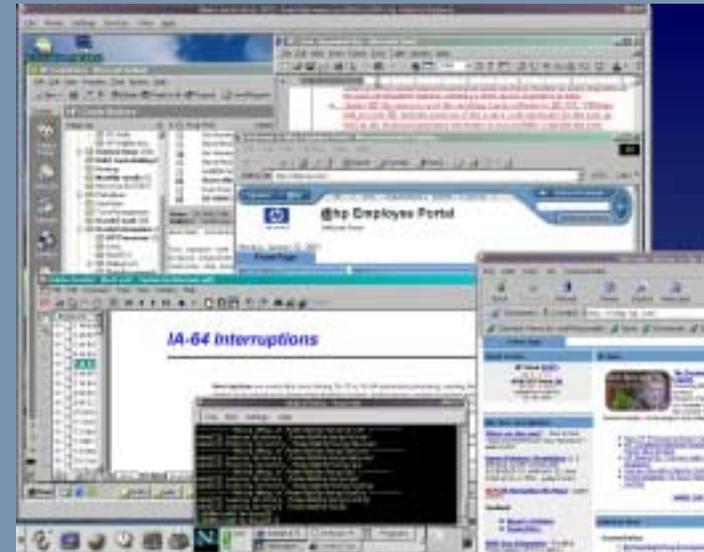


how do I run ia-32 apps on ia-64?  
hp-ux users must run a virtual machine



a virtual machine runs unmodified operating systems as applications

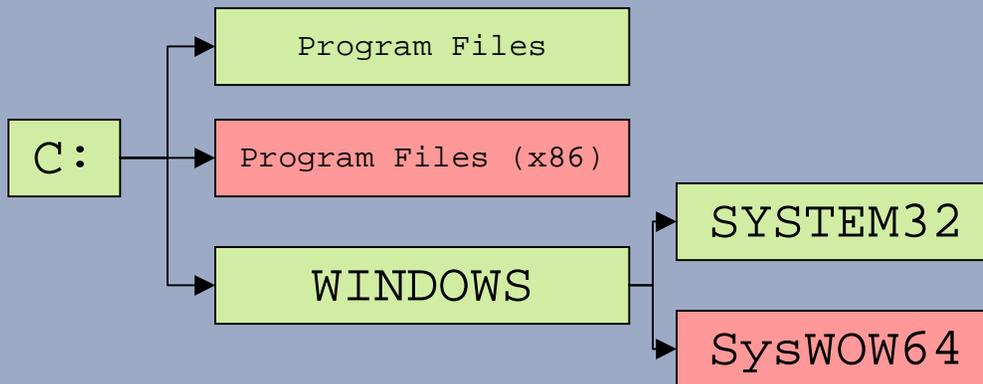
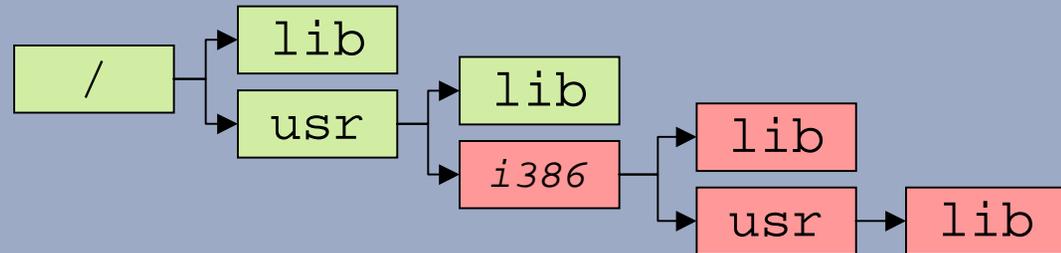
VM shows the "guest" operating systems in a window on your desktop



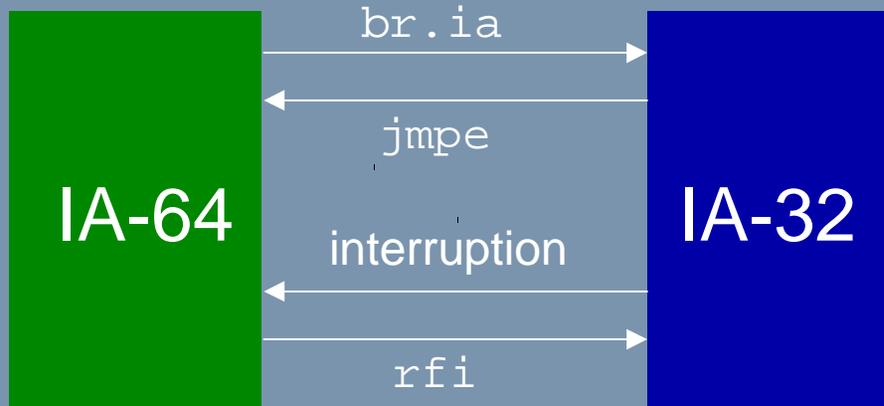


under the hood

# differences with your good old pc? shared libraries, installation



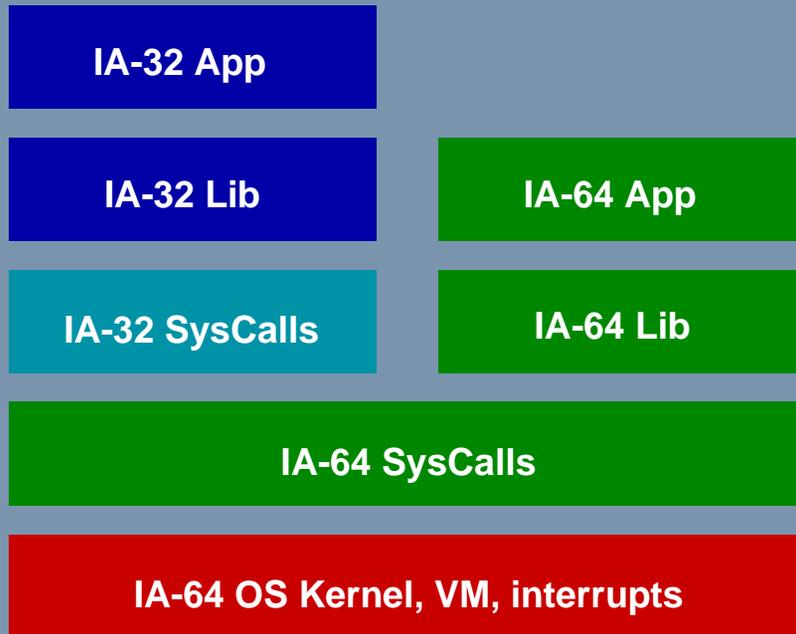
# cpu support for ia-32 code dual instruction mode



- dual instruction set
  - no kernel instructions
- shared registers
  - ia-64 code sees ia-32 data
- processor status register:
  - enable/disable transitions
  - current instruction set
- os always runs ia-64 code

# operating system support for ia-32 code

system calls, interrupts, memory management



- Forward syscalls to IA-64 code

- Convert from ILP32 to LP64
- Calling conventions conversion

- Process Interrupts

- ia-32 context as part of ia-64 state
- ia-32 specific interrupts & regs.

- Memory management

- 32-bit virtual space
- 64-bit physical space
- Memory mapped I/O ports

# ia-32 code performance

it *really* depends on the workload

Comparing to ia-64 indicates how to use the applications:

- bad = recompile
- good = use as is...

Comparing to ia-32 indicates if ia-64 is good for this app.:

- bad = choose Pentium
- good = choose Itanium

