

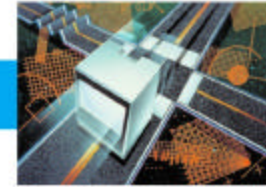
Migrating 3GL Applications

Christopher Koppe

Director of Marketing
Speedware Corporation
ckoppe@speedware.com

HP Platinum Partner





Agenda

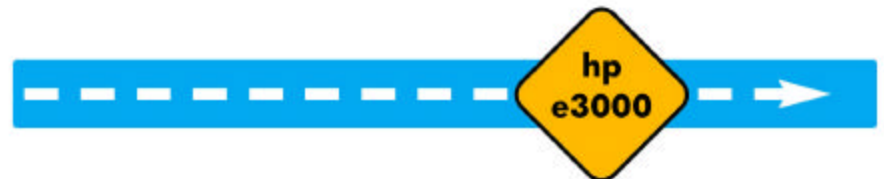
- Overview – Breaking Down The Problem
- Cobol
- Other 3GLs
- Automated Migration Solutions
 - Selecting a solution
- Final Advice

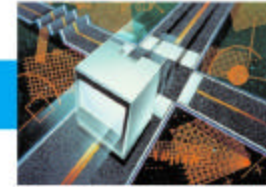




Overview

Breaking Down The Problem

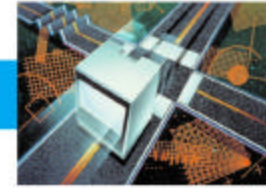




3GL Languages

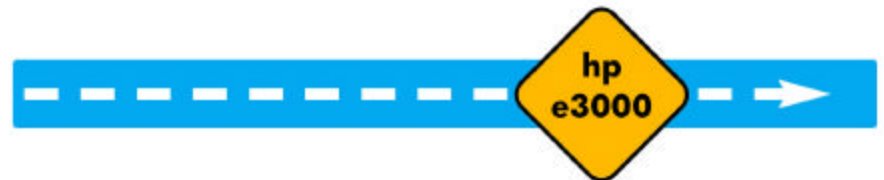
- Cobol
- Fortran
- Pascal
- RPG
- C
- SPL
- Business Basic

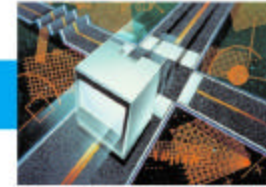




Major Components

- 4 major components of an application to deal with in a migration
 - 3GL Code Migration
 - Terminal Interface (VPlus)
 - Database / File Interface (Image, KSAM, Flat, etc)
 - OS Interaction (Intrinsics, commands, spooler, job queue, system variables, JCL, hardware device interaction, UDCs, etc.)

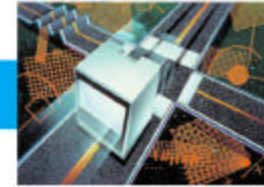




Other Issues

- Emulate or migrate
 - Emulate Image vs. migrate to SQL
 - Emulate JCL vs migrate to new OS scripts
 - Emulate VPlus vs. migrate to new GUI
- Recompile or translate?
 - recompile
 - picking the right compiler
 - picking the right migration tool
 - translate
 - stay in the language you're in on the 3000 or translate to another language?
 - What to do about VPlus, Image, MPE intrinsics
 - modern languages (java; Legacyj)
 - move gradually

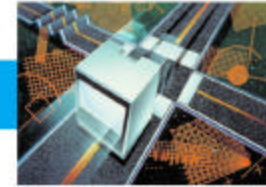




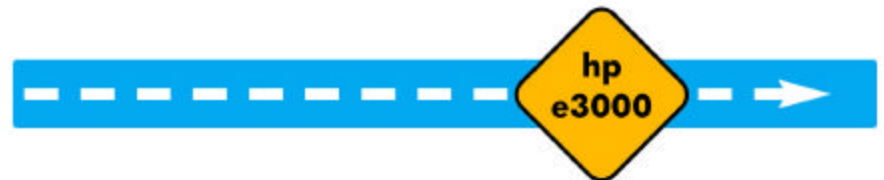
Other Issues

- Subsystem Decisions
 - If your programmers have written highly modular code, the migration will be easier
 - All the statements that must be modified will be in a single module
 - Not typical
 - The more typical case:
 - Most programs laced with calls to VPlus, TurboImage and other proprietary MPE intrinsics
 - Migrating this kind of code is much more difficult
 - May need to consider emulation as an alternative





Cobol Migrations

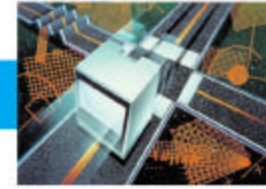




3GL Compilers (Cobol)

- Microfocus Cobol
 - Largest market share
 - Most costly
 - Native and portability options
- AcuCobol
 - Cheaper
 - Very popular with HP e3000 prospects
 - Portability and GUI interfaces
- Fujitsu Cobol
 - Not well known
 - Very cheap
 - Native solution only





Things to Consider

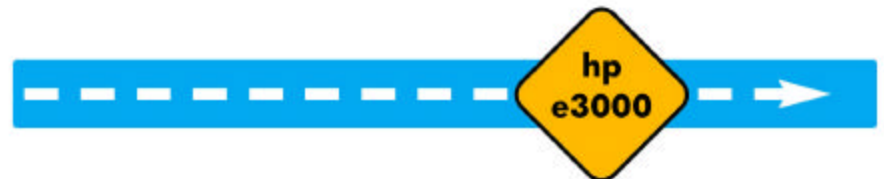
- Cobol Syntax
 - Reserved Words
 - Copy libs
 - \$INCLUDE
 - Macro expansion
- Reserved Words
 - For example: using “window” as a data item name works with hp cobol
 - AcuCobol uses “window” as a reserved word
 - With compile options you can turn off this reserved word, allowing you to leave the item name

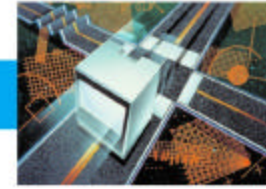




Things to Consider

- Externals
 - Passing of parm and info in run command\
 - Entry points
 - CIERROR
 - Job/session environment (e.g. Temp files)
- File system
 - File naming (FILE.GROUP.ACCT)
 - MPE file types
 - Record structures
 - Sharing file IDs (FDs as Intrinsic parameters)
 - Sort files
 - KSAM files
 - FILE equations.
 - Temporary files





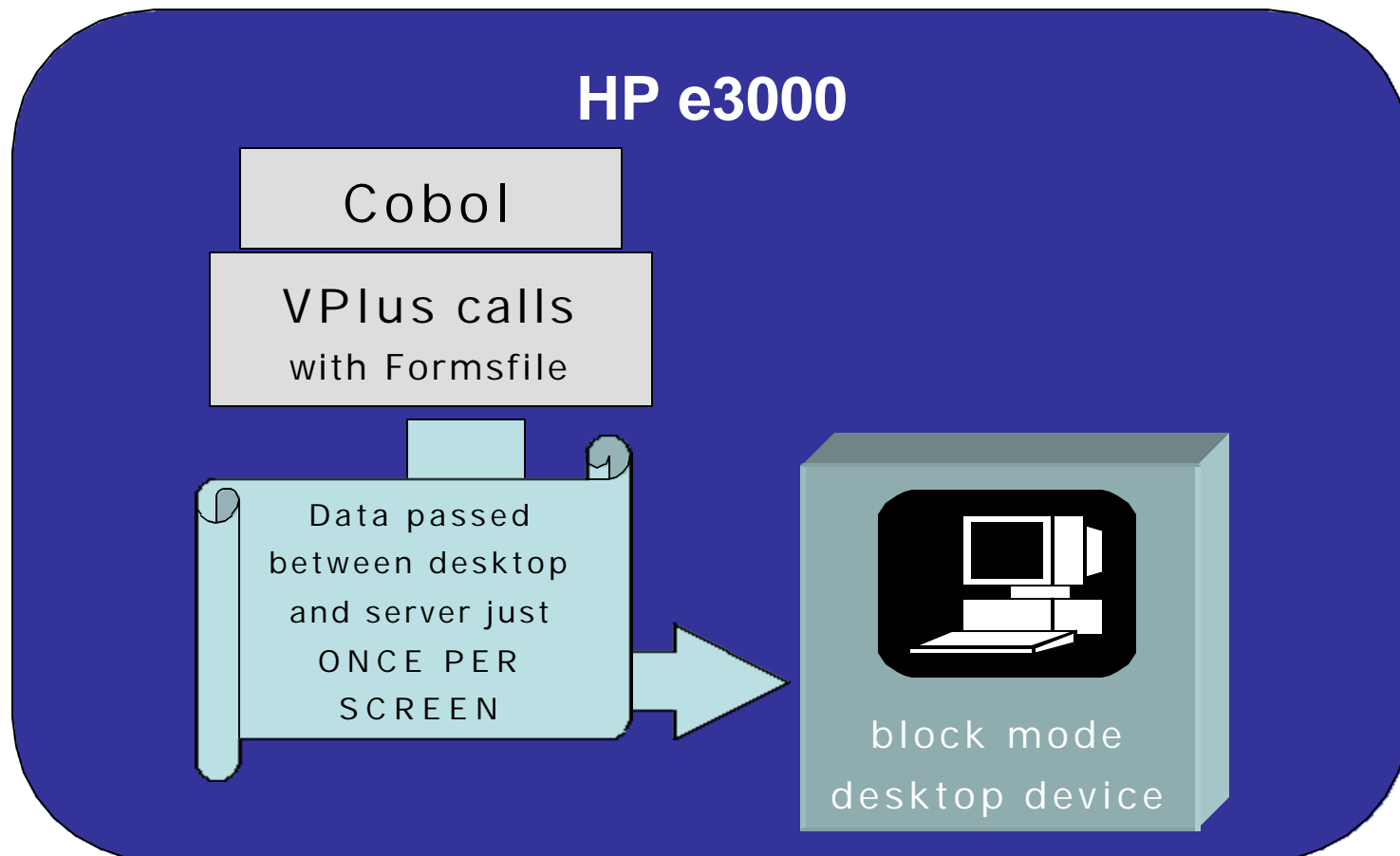
User Interface Issues

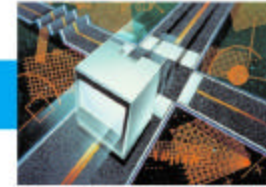
- VPlus
 - Emulation vs. Migration
 - Migrating the Screen
 - Migrating the Processing Specs
 - Dealing with STDLIST
 - Long term maintenance
- Character mode
 - Emulation vs. Migration
- Moving to a new GUI?
 - Web, Client / Server, VB, Java, etc.



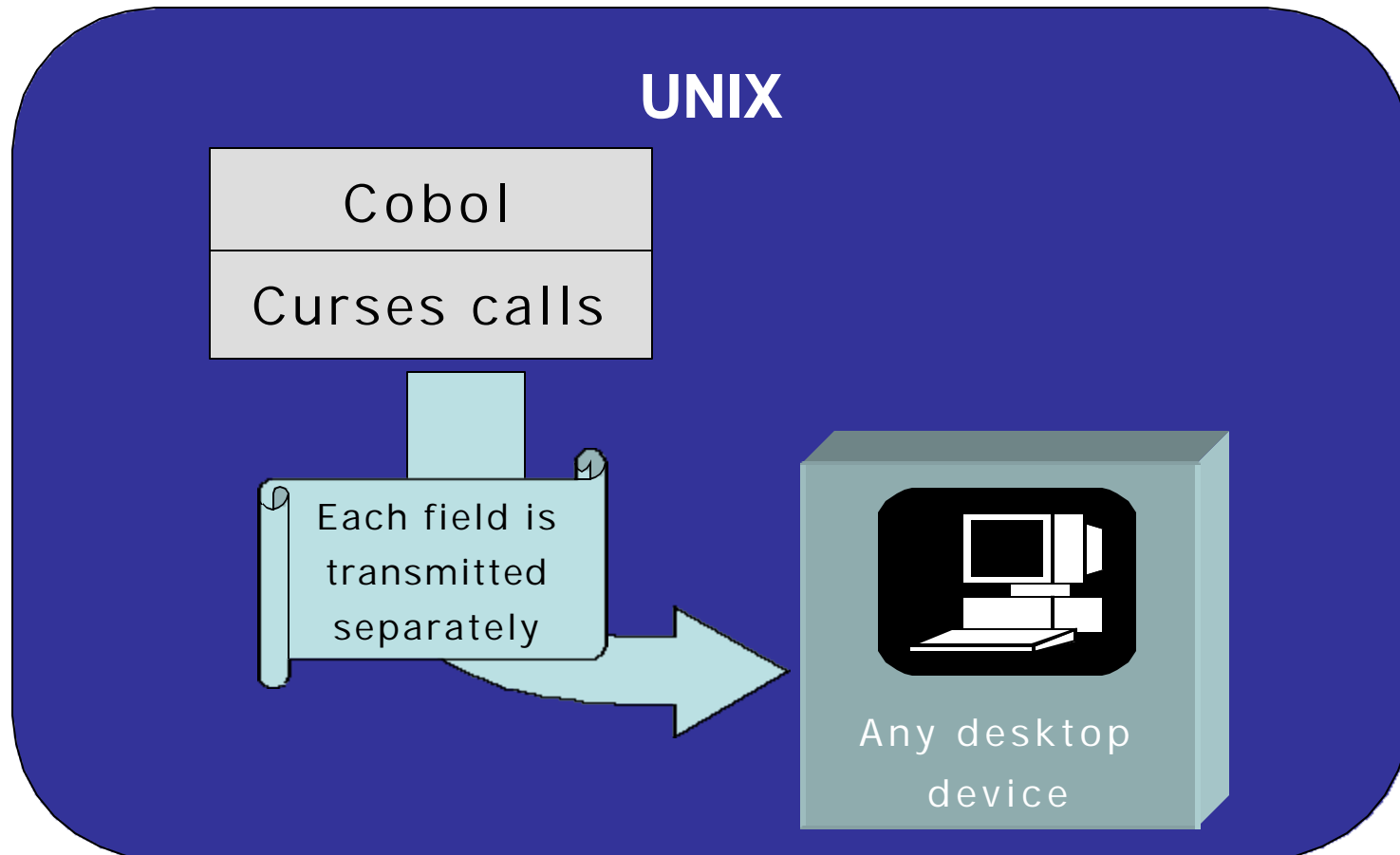


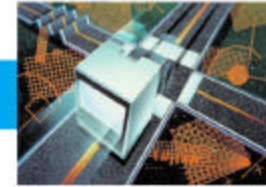
VPlus Overview



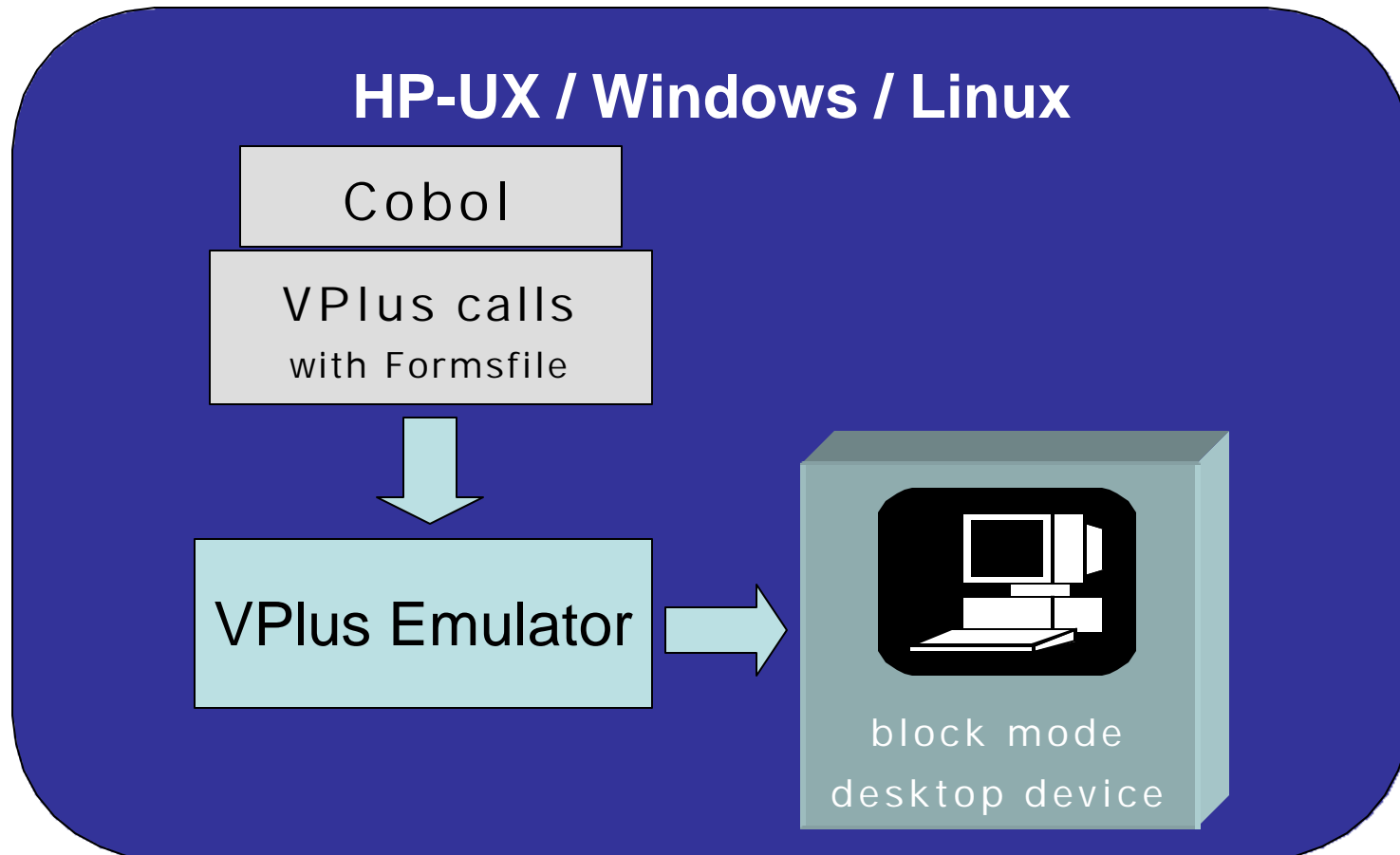


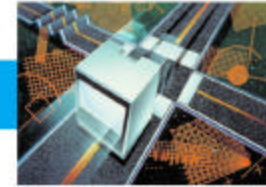
Character Mode Applications Overview



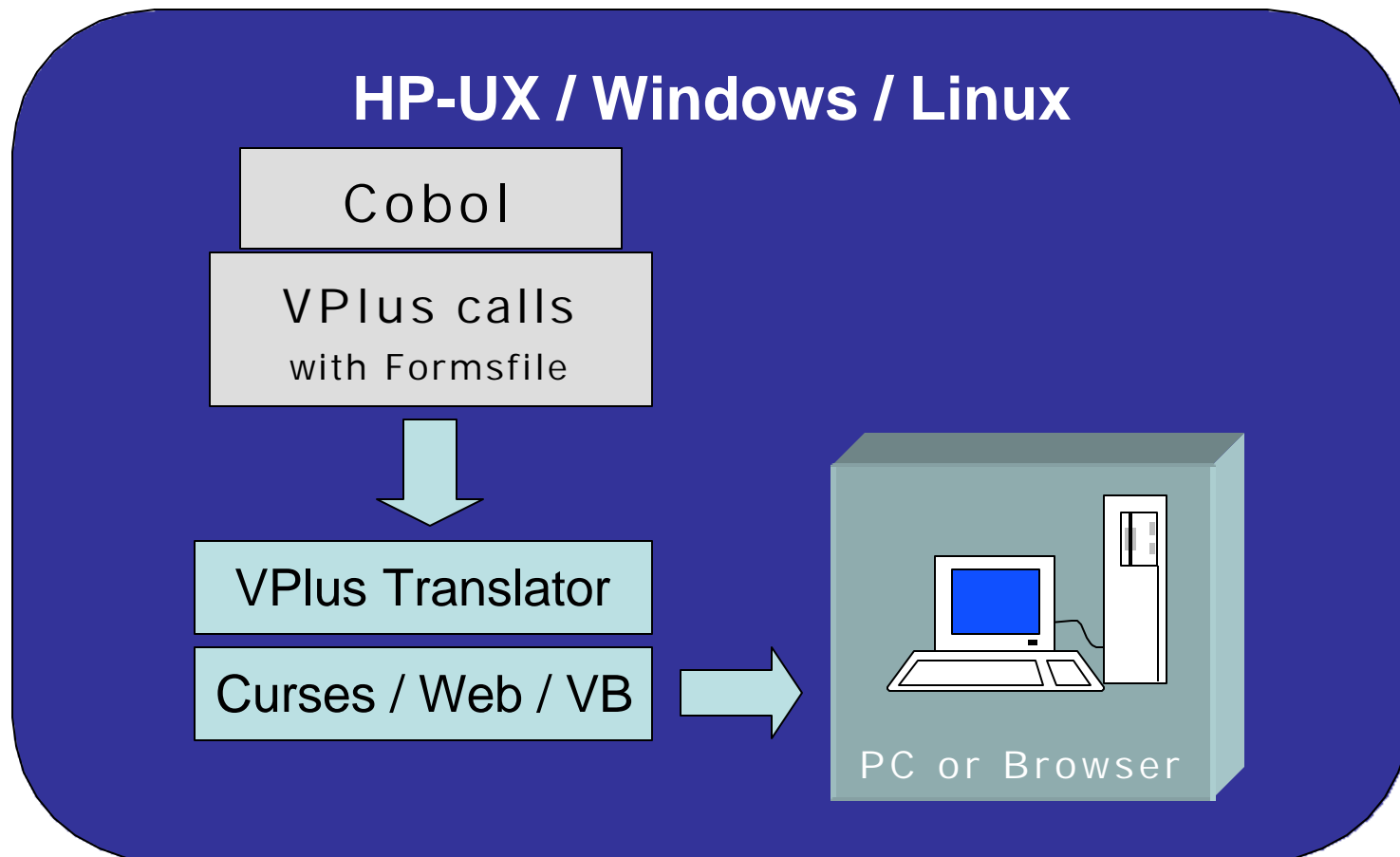


Option 1: VPlus Emulation



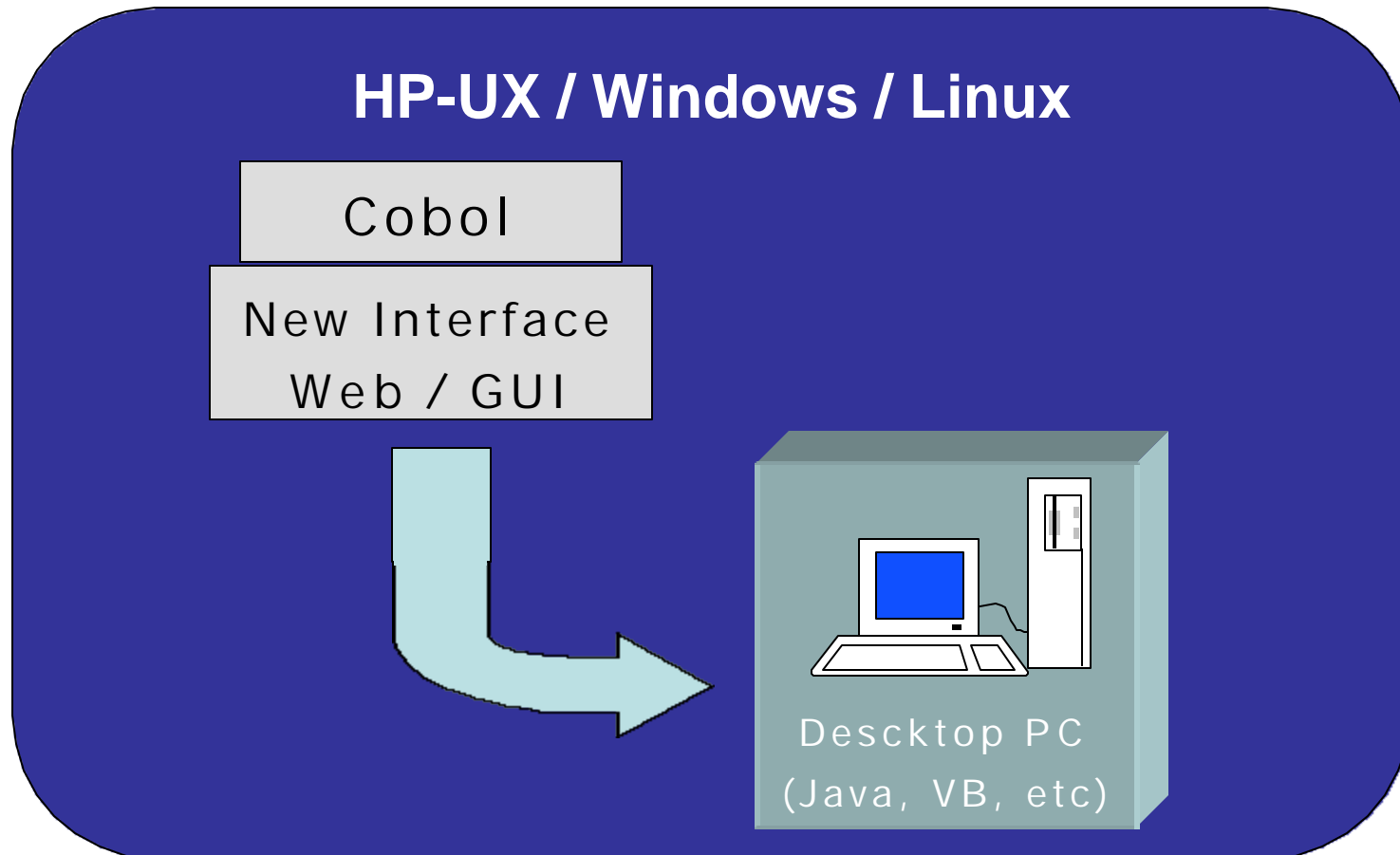


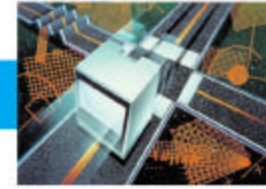
Option 2: VPlus Interception / Translation





Option 3: VPlus Replacement

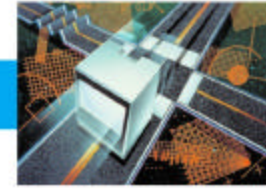




User Interface Options / Alternatives

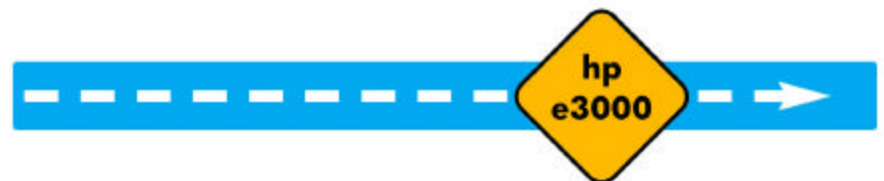
- Character-based solution / emulation (like Wingspan)
- GUI VPlus emulation (EdWin and ExegeClient)
- Cobol GUI (like AcuCobol GUI)
- Java (like PerCobol LegacyJ)
- Visual Basic GUI

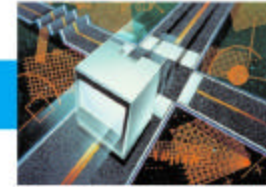




Database / File Interface

- Replacing Image, KSAM, and specialized flat files with alternatives on other platforms creates new challenges
 - Data Structure Changes
 - Data Type Changes
 - Variable Name Changes
 - Database / File Access Changes
 - Data Migration





How it works today

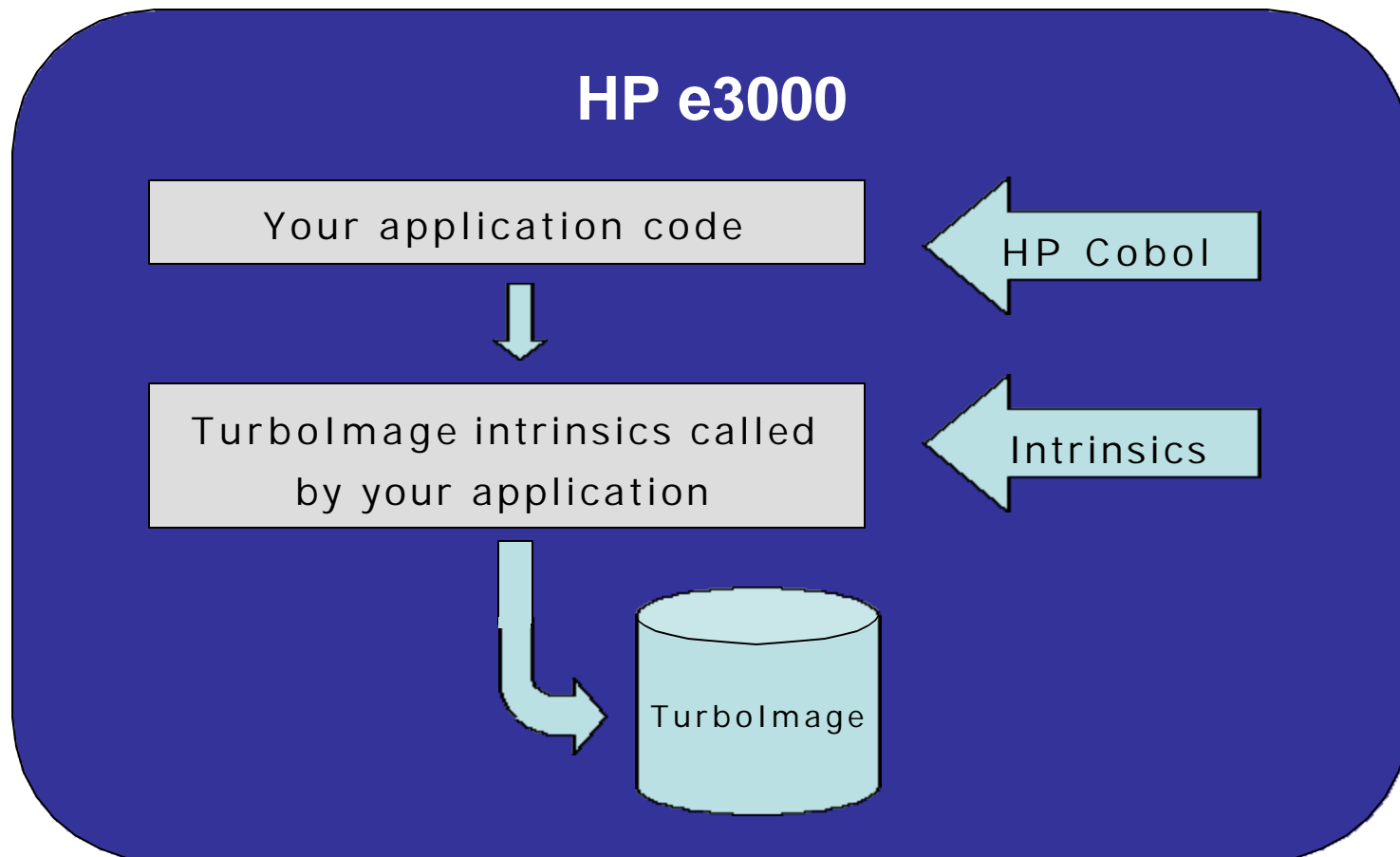
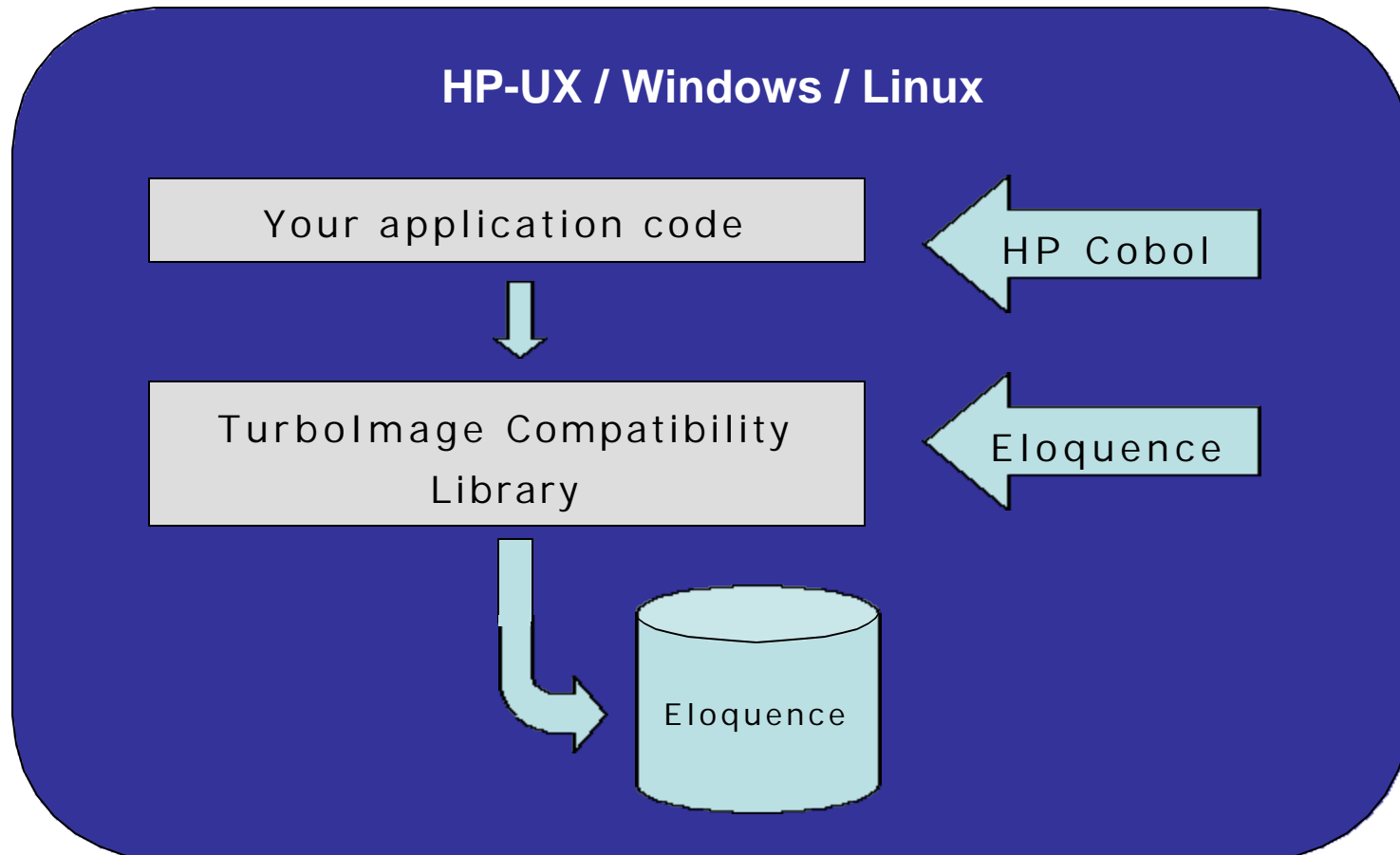




Image Look-alike Option



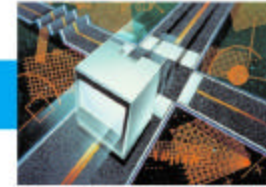
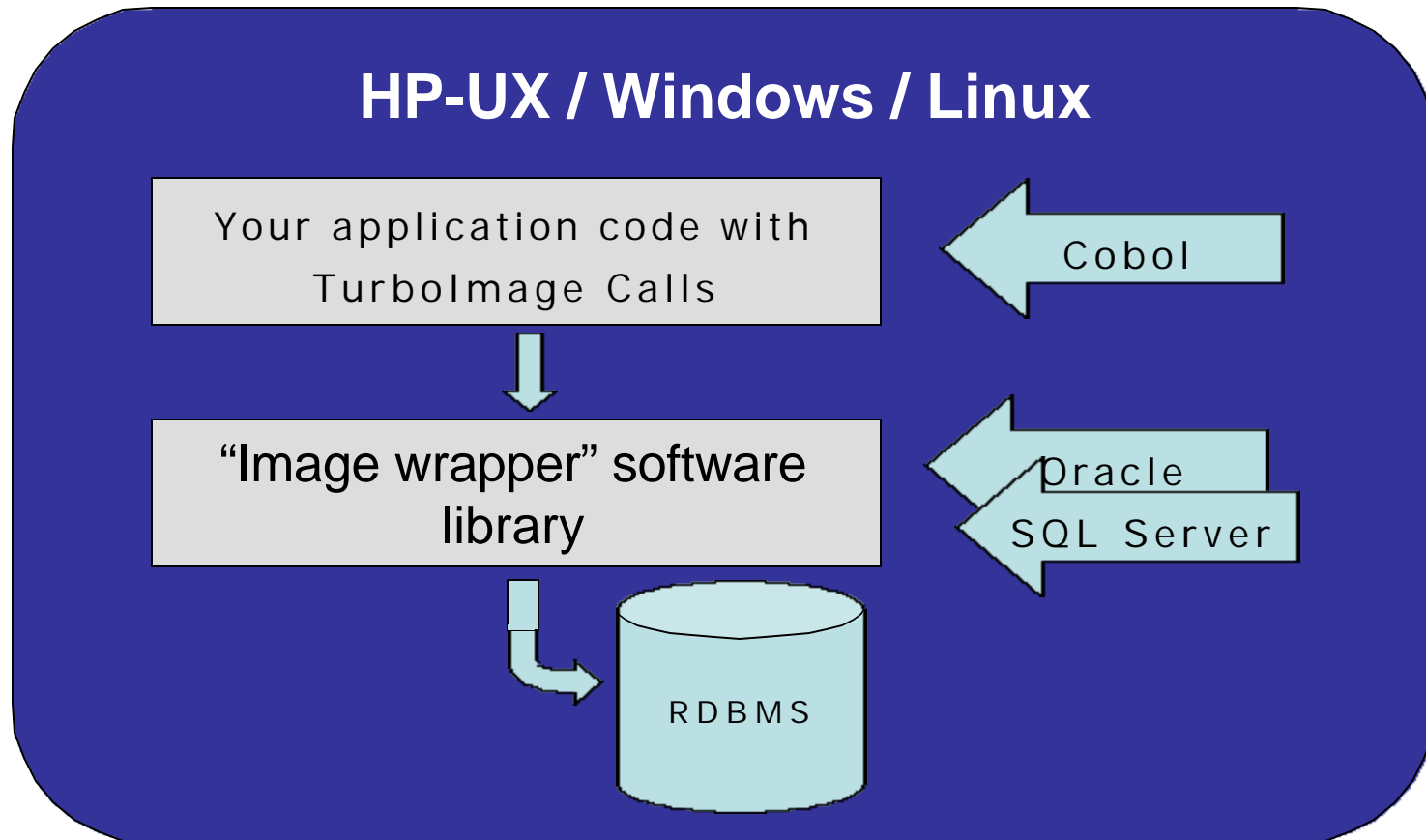
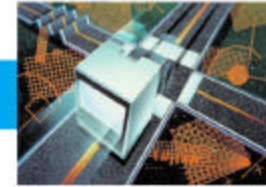
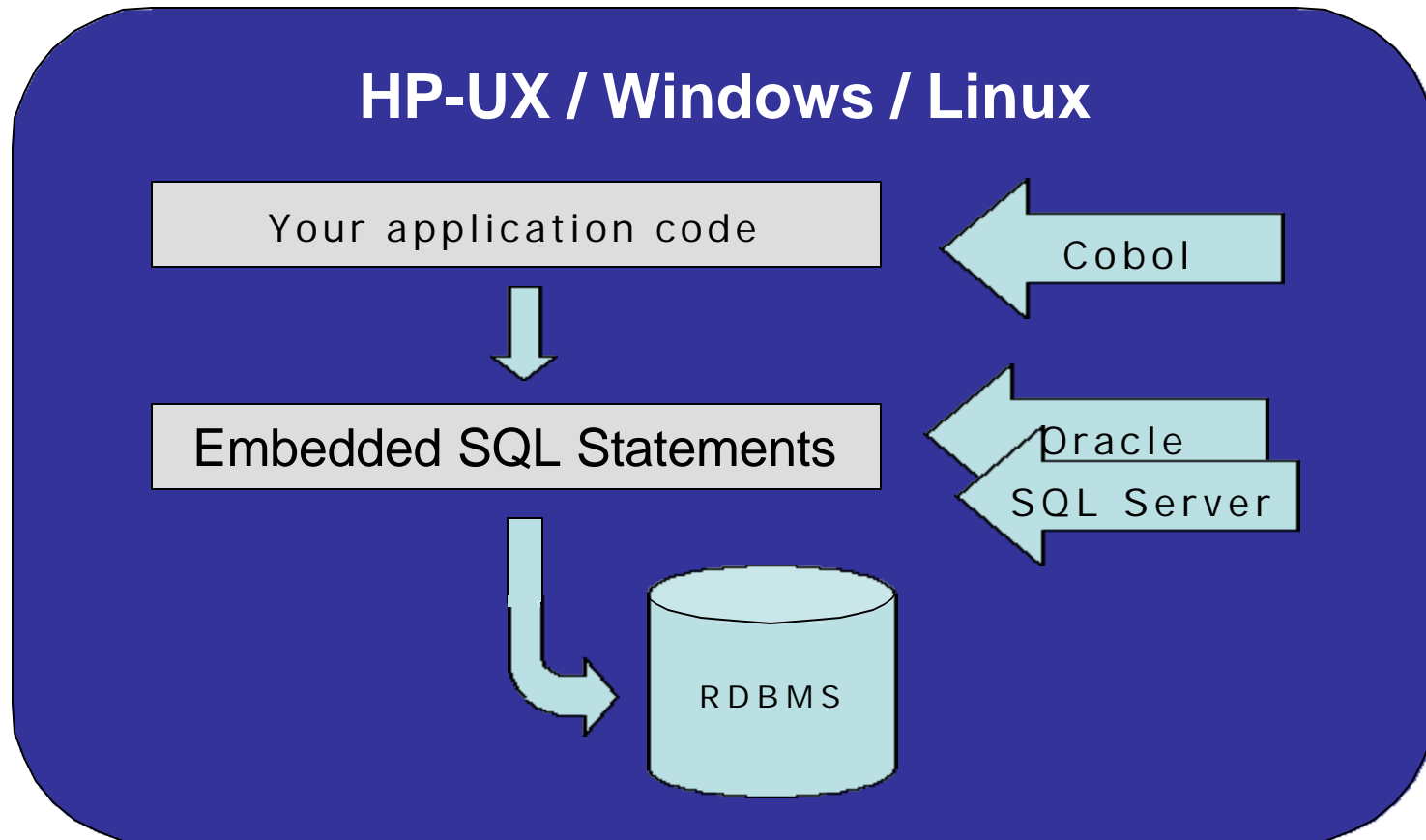


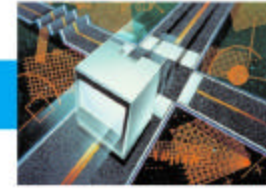
Image Wrapper Option





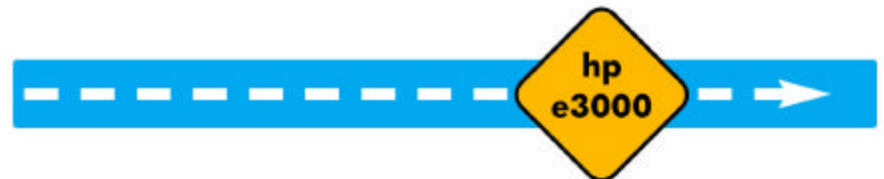
Redesign Option





OS Interaction

- Where the applications touched the OS needs to be dealt with
 - Intrinsic
 - Executing OS Commands
 - JCL
 - Spooler interaction
 - Interacting with the Job queue
 - System variables
 - Hardware device interaction
 - UDCs

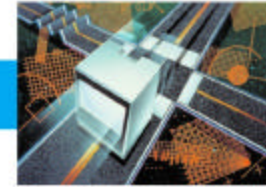




OS Interaction

- Solutions
 - Replace code with new OS commands / intrinsics / etc.
 - Manual effort
 - Very time consuming
 - Expensive to outsource
 - Use an MPE Emulation product as a translation layer between MPE and the new destination OS commands and utilities
 - Several vendors offer this capability
 - Most support 90%+ of MPE functionality
 - Fastest migration path possible
 - Enables gradual move to native statements
 - There is a \$ cost to using this type of solution

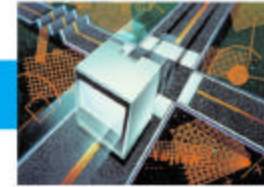




Other 3GLs

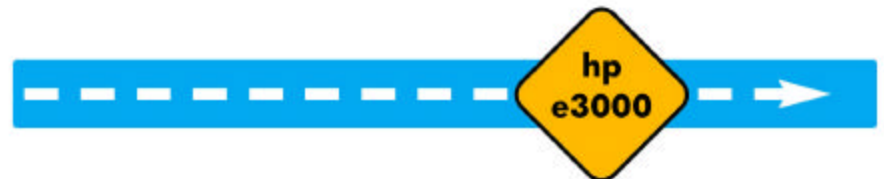
Fortran
Pascal
RPG
C
SPL
Business Basic

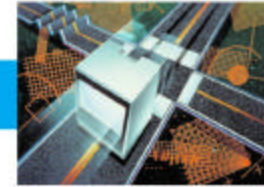




Fortran

- There are only 2 solutions (Fortran 77 to Fortran 77)
 - ViaNova 3000 (Ordina Denkart)
 - AMXW (Neartek)
- The solution can be determined based on the customers needs
 - Customer wants to do it themselves
 - Best Fit: AMXW (Neartek) is the only solution that is sold as a toolset for customers to do it themselves.
 - Alternative: ViaNova 3000 (Ordina Denkart) is a quick way for someone else to do 90%+ of the migration automation.
 - Finishing work is done manually (no tools)
 - Customer wants it outsourced
 - Best fit: ViaNova 3000 (Ordina Denkart) can provide 100% of the solution upon request.
 - Alternative: Neartek with a Neartek partner can provide a 100% solution.
- VPlus (if used) would have to be treated in the same way as Cobol

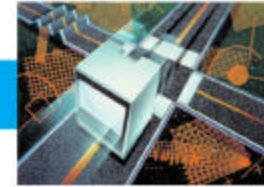




Pascal

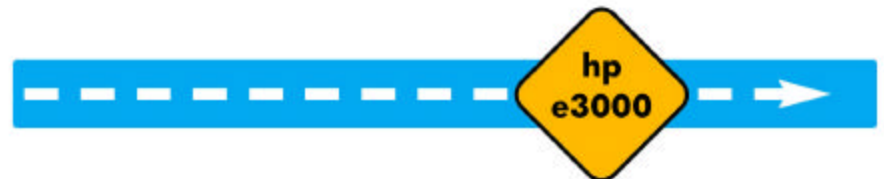
- Pascal is available on the HP-UX platform, however:
 - Will not be supported on IA-64, except in compatibility mode
 - Pascal (HP-UX) will come off HP price list by end of 2002 and will only be supported for 2 years beyond that.
 - Migration is relatively straightforward, but there are no automated tools.
 - MPE / Image Emulation will still be an issue
- Best options:
 - Pascal to C: ViaNova 3000 (Ordina Denkart)
 - Combine with MPUX to get MPE emulation for a quick and clean solution
 - There are other Pascal to C migration tools.
 - Sunguard Bi-Tech has one.

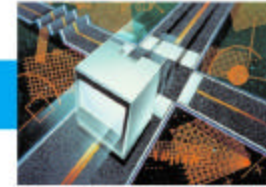




RPG

- There are 2 solutions for RPG
 - Richter Software has an RPG to HP Cobol migration solution
 - Proven
 - The only solution to really take care of MPE issues
 - There are 2 RPG compilers available for HP-UX, however:
 - There are no migration tools
 - Migration will be very difficult
- RPG on MPE is very bound to the MPE OS and therefore is not very portable to other platforms
 - A migration tool is a must. Therefore, only Richter is a viable option today.

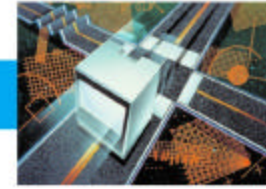




C

- ViaNova 3000 (Ordina Denkart) has a migration solution to migrate C to HP-UX or Windows.
 - Combine this with MPUX for MPE Emulation

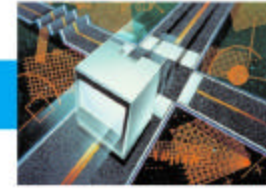




SPL

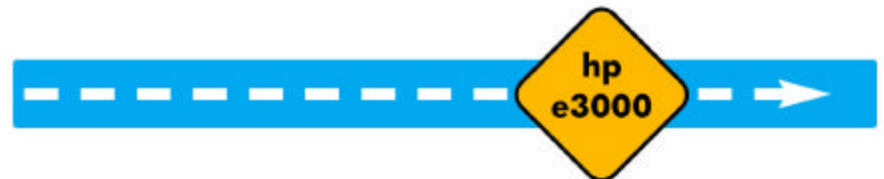
- AD Technologies and Allegro are working on a SPLash compiler for HP-UX / Windows / Linux.
- There are 2 known migration solutions that will migrate SPL to C
 - ViaNova 3000 (Denkart)
 - AMXW (Neartek)
 - *Both can also offer MPE emulation*





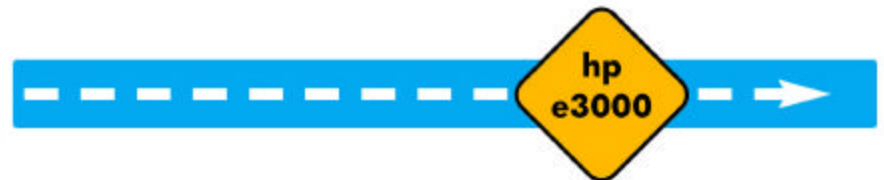
Business Basic

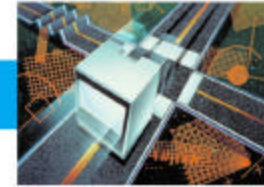
- The only known option is from Marxmeier Software with the Eloquence product
 - Eloquence comes with Business Basic (that is compatible with the Business Basic on MPE)
 - MPE Emulation would need to be added
 - Could do up to 90% of the job
 - There are some tools to automate the migration process
- An alternative on the PC could be to go to Visual Basic, however, there are no migration tools





Automated Migration Solutions





3GL Migration Solutions

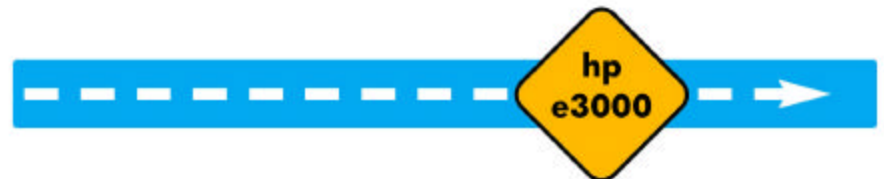
Cobol (VPLUS)	Denkart, Neartek, Transoft, Sungard Bi-Tech, AD Technologies
Fortran	Fortran 77 on HP-UX Denkart, Neartek
Pascal	Pascal on HP-UX (end-of-support in 2 years) Pascal to C converter (Denkart, Sungard Bi-Tech)
RPG	RPG to HP Cobol Migrator (Richter Software) RPG on HP-UX (no migration tools)
HP Business Basic	Business Basic in Eloquence product Visual Basic (no migration tools)
SPL	Splash on HP-UX (coming soon) SPL to C converter (Denkart)
C	Not really a problem (Denkart)

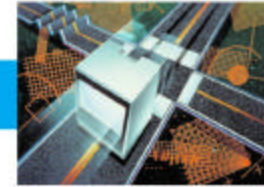




3GL Migration Tools

- 4 HP-validated migration solutions
 - Denkart
 - ASP model of migration, charged by number of lines of code, 95% migrated
 - Many 3GL options
 - Neartek
 - Migration tools, packaged and sold as a toolset.
 - Transoft
 - Migration toolset, sold as a consultative solution.
 - Sungard Bi-Tech
 - Migration toolset, sold via consulting, residual run-time libraries for Image and OS calls





Ordina Denkart

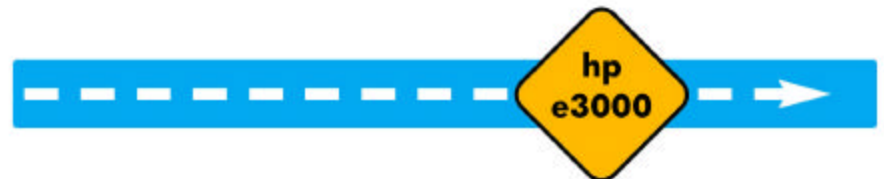
- ViaNova 3000, plus
 - WingSpan – VPlus emulation on non-MPE systems
 - EdWin – Graphical interface for VPlus emulation
 - MPEUX – MPE Emulation layer
 - Complete and proven
 - Includes support for OS intrinsics, MPE commands, batch jobs and management, spooler, and other MPE utilities.
 - ORDAT is used for DB Intrinsics to Oracle
- Migration of multiple 3GLs
 - To many platforms, incl. HP-UX and Windows
 - HP Cobol to Microfocus Cobol (only)
 - Working on AcuCobol option
 - Fortran 77 to Fortran 77
 - Fortran to C/C++
 - Pascal to C++
 - C to C/C++
 - SPL to C/C++

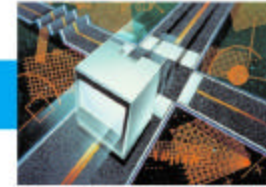




Ordina Denkart

- Solution is sold in a remote service model
 - Turn around time of basic migration is as short as a few days
 - How it works
 - customer's code is sent to them
 - They run it through an estimator
 - They provide a quote
 - If the customer agrees and signs off, the migration is performed
 - Completed work, along with error reports for what didn't convert are sent back to the customer
 - Customer must complete the work himself, OR
 - Another partner completes the work

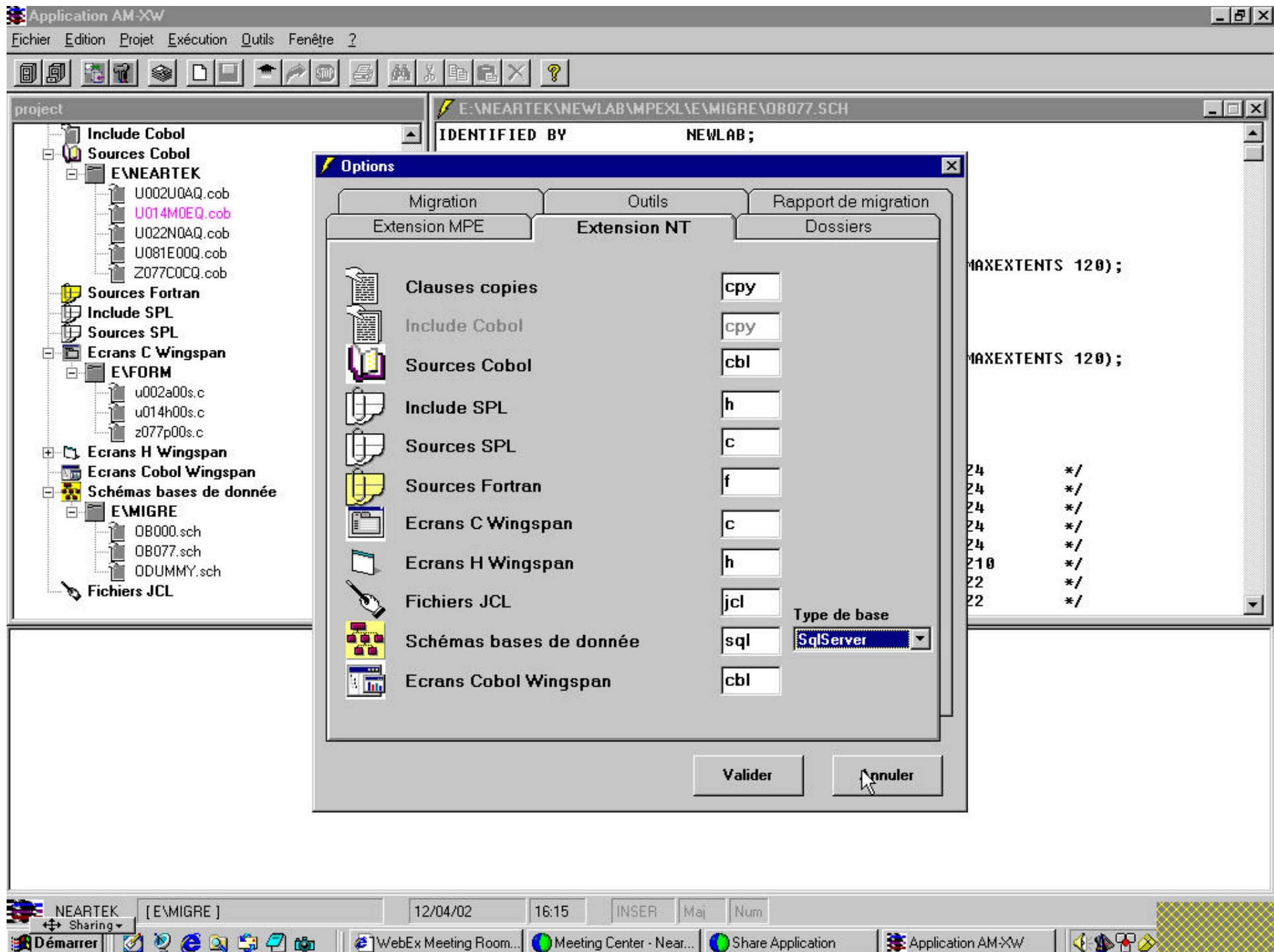


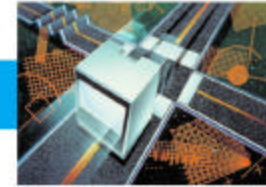


Neartek

- AMXW
 - Includes an MPE Emulation layer for OS intrinsics, MPE commands, batch jobs, and other MPE utilities.
 - Includes Image Intrinsic trapping layer
 - Combines with EdWin (from Ordina Denkart) for VPlus graphical emulation
- Migration of multiple 3GLs
 - HP Cobol to Microfocus Cobol (only)
 - Working on AcuCobol option
 - Fortran 77 to Fortran 77
- Solution is sold as a tool only.
 - Ideal for customers that want to do it themselves
 - Price is based on number of lines of code to be migrated per application

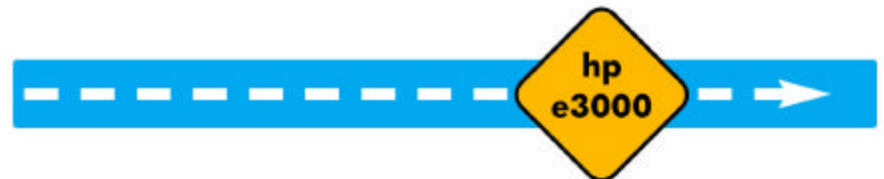






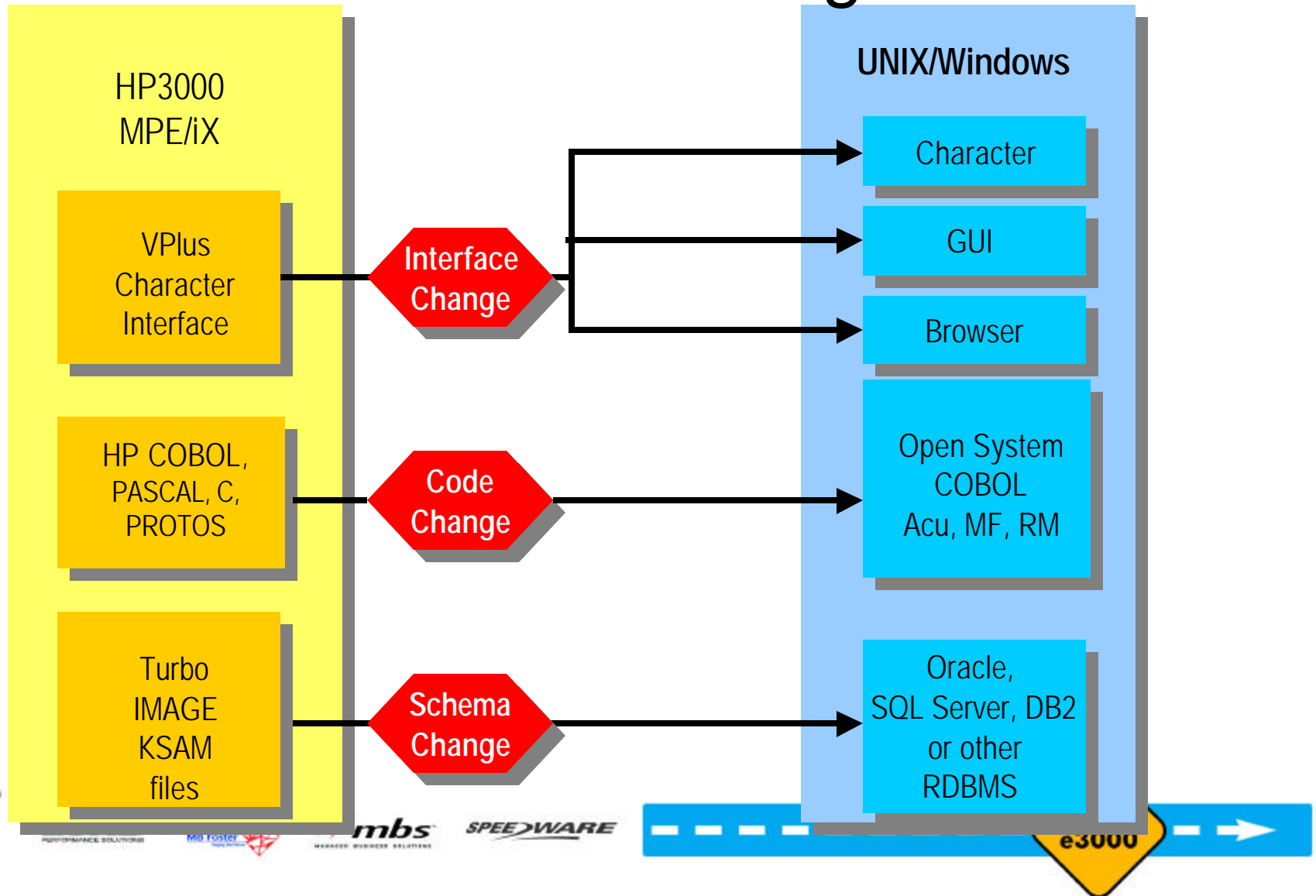
Transoft

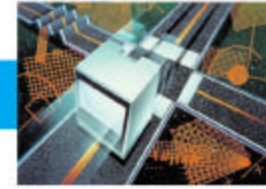
- Solution sold as Consulting Service
- How it works
 - Source code statistics sent to Transoft
 - Quote provided based on code complexity
 - Based on acceptance, code sent to Transoft
 - Converted code installed/tested at customer site with Transoft or PP





Transoft Offerings





Sungard Bi-Tech

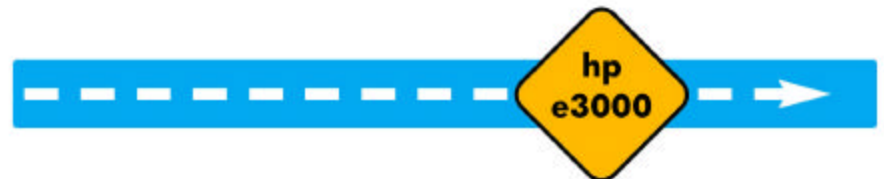
- Transport
 - HP Cobol to Microfocus Cobol
 - Pascal to C
 - Includes MPE emulation
 - Includes VPlus emulation
- Proven
 - Been used for many years against many applications
- Only sold through a 3rd party consulting organization

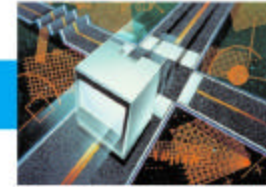




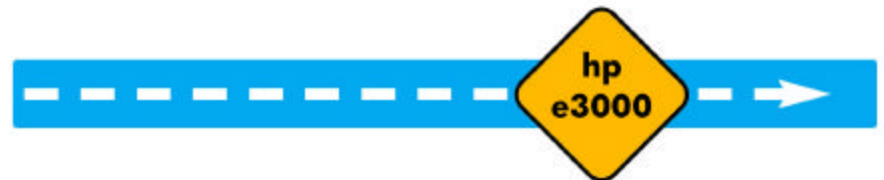
Richter Software

- RPG to HP Cobol Migrations
 - HP e3000 to HP e3000
 - Going to HP-UX or MPE is a secondary step using the other partners
 - This is the only proven RPG solution
 - Some work may be required after the base migration to clean it up
 - Richter can perform this service for an additional fee based on time and material.
- Solution is sold in a remote service model
 - Turn around time is a few weeks





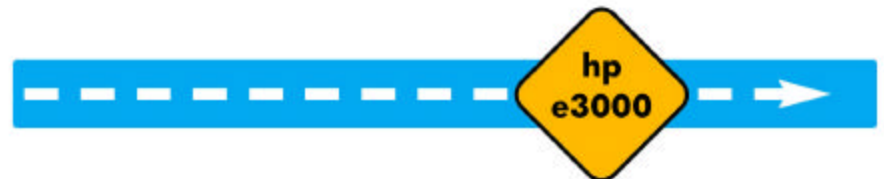
Selecting a Solution

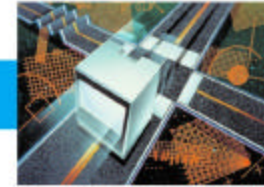




How To Choose A Solution Vendor?

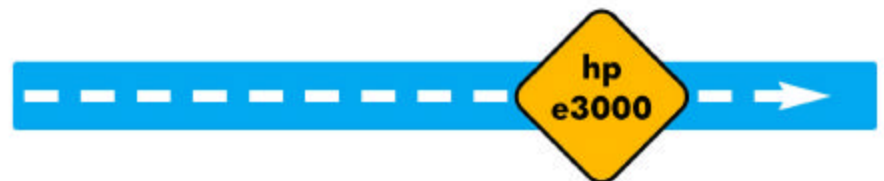
- Factors that influence vendor choice
 - Time requirements
 - Some are faster than others
 - Resource availability
 - Do they have staff to do any of it themselves?
 - Budget restrictions
 - Some cost more than others
 - End result
 - More native solutions take more time and cost more
 - Faster solutions use run-time emulators
 - Migration Methodology / Technology
 - Strategic IT Direction

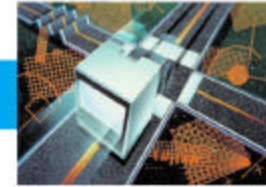




Cobol examples

- Solution is based on what best fits the customers needs
 - Customer wants to do it themselves
 - Best Fit: AMXW (Neartek) is the only solution that is sold as a toolset for customers to do it themselves.
 - Alternative: ViaNova 3000 (Ordina Denkart) is a quick way for someone else to do 90%+ of the migration automation.
 - Finishing work is done manually (no tools)
 - Customer wants it outsourced
 - Best Fit: Transoft will take 100% control of consulting project from beginning to end.
 - Alternative: ViaNova 3000 (Ordina Denkart) can provide 100% of the solution upon request.
 - Alternative: Neartek with a Neartek partner can provide a 100% solution.

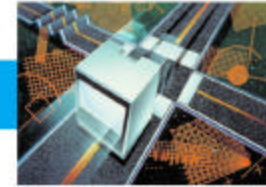




Cobol examples

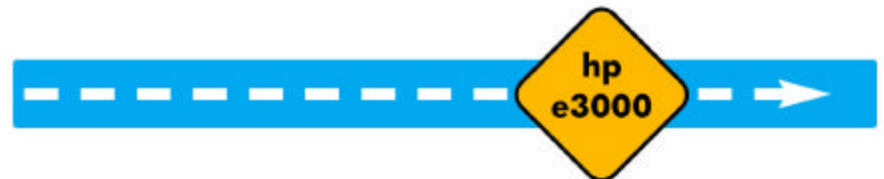
- Solution is based on what best fits the customers needs
 - Customer wants it fast
 - Best Fit: ViaNova 3000 (Ordina Denkart) – up to 95% will be done within a couple of days. Total project can be measured in weeks, not months
 - Alternative: AMXW (Neartek) – can be done fast, but you are doing it yourself
 - Customer wants the result as Native as possible (no MPE / Image emulation)
 - Best Fit: Transoft will replace all MPE / Image references with native counterparts, however, this will take longer and cost more.





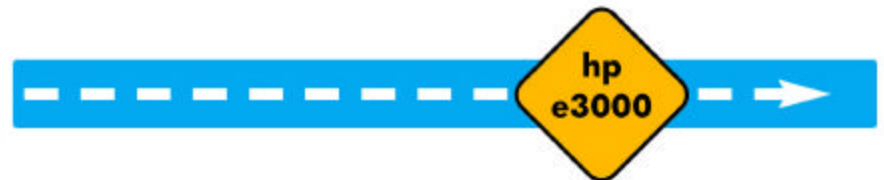
Cobol

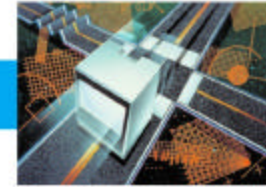
- VPlus Emulations / Solutions
 - EdWin (Ordina Denkart) is a graphical version of VPlus emulation for non-MPE platforms
 - App2XML (Cheops) is a graphical Vplus emulation
 - ExegeClient
 - ScreenJet has a migration toolkit to convert VPlus to AcuBench (AcuCobol)
 - AD Technologies has a migration toolkit to convert VPlus to AcuBench (AcuCobol)
 - Others...
- MPE Emulation
 - Both ViaNova 3000 (Ordina Denkart) and AMXW (Neartek) offer proven MPE emulation products with their migration tools.
 - These products include OS intrinsics, MPE commands, batch jobs, spoolers, and other utilities.
 - Transport (Sunguard Bi-Tech) also has this feature.





Final Advice





Final Advice

- Seek advice from Platinum Partners
 - Chosen by HP for their migration and integration expertise
 - They have done the homework on who is good at what
 - Platinum partners offer one-stop shopping for all these tools
 - Think of Platinum partners as “General Contractors”
- Don’t under-estimate how many resources it might take
 - Especially for testing
- Choose the right compiler / migration tool combination
 - Clearly identify target, budget, resource constraints, and desired end result.





Thank You

Questions & Answers

