

Understanding the difference between COBOL migration tools

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Agenda

- Why consider a COBOL migration solution?
- Migration options
- Automated solutions
- Solutions comparison
- How to select your solution...

Why consider COBOL migration solutions ?

Breaking down the problem



Why consider COBOL migration solutions?

- Definition of HP Cobol
 - HP COBOL is an implementation of ANSI standard COBOL, with some extensions and differences.
- What is the problem?
 - HP Cobol compiler does not exist on other platforms
 - Technologies referred by code do not exist on other platforms
 - Concepts are different on other platforms
 - Lots of code and concepts need to be adapted
 - Significant investment of time and resources
- Specifics
 - Syntax
 - Extensions
 - Concepts

Understanding HP COBOL

- How does HP Cobol differ from ANSI Cobol and other compilers?
 - Syntax and compiler directives
 - e.g. comma, dot, semicolon, "<>", etc.
 - e.g. \$PAGE, \$TITLE, \$EDIT, \$DEFINE, \$COMMENT, \$CONTROL QUOTE, \$CONTROL LIST, \$INCLUDE
 - HP-specific extensions
 - ACCEPT MY-DATA **FREE ON INPUT ERROR**
 - CALL...**GIVING**
 - MOVE **%33** TO MY VALUE

Understanding HP COBOL

- How does HP Cobol differ from ANSI Cobol?
 - HP-specific concepts
 - e.g. MOVE **"!JOB J123, MANAGER.SYS"** TO OUT-REC
 - e.g. MOVE **"FILE MYFILE;DEV=LP"** TO COMMAND-BUF
 - e.g. Checking **CIERROR**
 - e.g. Passing **PARM** and **INFO** on RUN command
 - e.g. Specifying an entry point
 - Reserved Words (HP or other compilers)
 - e.g. DIVIDE-BY-ZERO, BEGINNING, COMMON, DISABLE, ENABLE, ENDING, FILE-LIMITS, MORE-LABELS, PROCESSING, WINDOW

Understanding HP COBOL

- Differences broken down into 3 major components
 - Terminal Interface
 - VPLUS, terminal I/O
 - Database / File Interface
 - Image, KSAM, Flat, DB migration, etc.
 - OS interface
 - Intrinsic, commands, COPYLIB, file eq, spooler, job queue, system variables, JCL, hardware device interaction, UDCs, etc.

Understanding HP COBOL Terminal interface – VPLUS

- VPLUS forms
 - Does not exist on other platforms
 - Intrinsic must be converted, removed or “wrapped”
 - Flow of application may need to be adapted

Understanding HP COBOL VPLUS intrinsics



- VCHANGEFIELD
- VCLOSEBATCH
- VCLOSEFORMF
- VCLOSETERM
- VERRMSG
- VFIELDEDITS
- VFINISHFORM
- VGETBUFFER
- VGETFIELD
- VGETFIELDINFO
- VGETFILEINFO
- VGETFORMINFO
- VGETKEYLABELS
- VGETLANG
- VGETNEXTFORM
- VGETtype
- VINITFORM
- VLOADFORMS
- VOPENBATCH
- VOPENFORMF
- VOPENTERM
- VPLACECURSOR
- VPOSTBATCH
- VPRINTFORM
- VPRINTSCREEN
- VPUTBUFFER
- VPUTFIELD
- VPUJType
- VPUTWINDOW
- VREADBATCH
- VREADFIELDS
- VSETERROR
- VSETKEYLABEL
- VSETKEYLABELS
- VSETLANG
- VSHOWFORM
- VUNLOADFORM
- VWRITEBATCH

Understanding HP COBOL Database / File interface

■ Database

- TurboImage: Does not exist on other platforms
 - TurboImage is accessed with HP Image intrinsics
 - Code is very specific to Image methodology
 - Usually, the intrinsics are intertwined in the application
- Image/SQL: Does not exist on other platforms
- Allbase/SQL: Does not exist on other platforms (HPUX - not supported)

■ File system

- File naming (FILE.GROUP.ACCT)
- Cobol statements or intrinsics
 - Cobol statements: OPEN, READ, WRITE
 - Intrinsics: FOPEN, FREAD, FWRITE, etc.
- MPE file types: RIO, MSG, Circular, etc.
- KSAM files
- Temporary files

Database / File interface

Errors example

HP COBOL II/XL DB Intrinsic calls	Errors or Warnings Encountered
CALL "DBOPEN" USING DB-NAME DB-PSWD DB-MODE DB-STATUS - DBOPEN	173 called program file not found in drive or directory
CALL "DBGET" USING DB-NAME DB-SET1 DB-MODE DB-STATUS ITEM-LIST EMPMST-BUFFER KEY-VALUE	173 called program not found in drive or directory - DBGET
CALL "DBLOCK" USING DB-NAME LOCK-DESCRIPTOR DB-MODE DB-STATUS	173 called program not found in drive or directory - DBLOCK
CALL "DBERROR" USING DB-STATUS MSGBUF MSGBUFLN	173 called program not found in drive or directory - DBERROR
CALL "DBEXPLAIN" USING DB-STATUS.	173 called program not found in drive or directory - DBEXPLAIN
CALL "DBPUT" USING DB-NAME DB-SET1 DB-MODE DB-STATUS ITEM-LIST EMPMST-BUFFER	173 called program not found in drive or directory - DBPUT
CALL "DBCLOSE" USING DB-NAME DB-SET1 DB-MODE DB-STATUS.	173 called program not found in drive or directory _ DBCLOSE

Database / File interface

SQL code equivalent

select empind assign disk
Organization is indexed
Record key is emp-no-f
Access is random
lock mode is automatic with lock
on multiple records

01 emp-details-f.
 05 emp-no-f pic
 s9(4) comp.

open I-O empind
with lock.

if emp-status not =
"00"
 close empind
 open output
empind.

Write emp-details-f
from emp-details-ws
invalid key
Perform error-para.

close empind with
lock.

Database / File interface

Image intrinsics and SQL

HP Code with DB Intrinsics	MF Code with SQL Statements
CALL "DBOPEN" USING DB-NAME DB-PSWD DB-MODE DB-STATUS	EXEC SQL CONNECT TO "HP2SUN Sample2" END-EXEC.
CALL "DBGET" USING DB-NAME DB-SET1 DB-MODE DB-STATUS ITEM-LIST EMPMST-BUFFER KEY-VALUE	EXEC SQL SELECT emp-no, emp-name, emp-addr , emp-phnrEmp-sal ,emp-desig,emp-proj INTO :emp-no-f, :emp-name-f,:emp-addr-f, :emp-phnr-f, :emp-sal-f,:emp-desig-f :emp-proj-f FROM employee WHERE emp-no = :emp-no-f END-EXEC
CALL "DBCLOSE" USING DB-NAME DB-SET1 DB-MODE DB-STATUS	EXEC SQL DISCONNECT CURRENT END-EXEC

Understanding HP COBOL OS interface

- Areas that need attention
 - Calls of OS Intrinsics
 - Executing OS Commands
 - File equations
 - UDC utilization
 - JCL code
 - System variables
 - Interaction with spoolers
 - Interaction with Jobs
 - Interaction with forms
 - Interaction with hardware devices

Understanding HP COBOL OS interface

■ Cobol Concepts

- Copylibs
 - KSAM files need to be migrated
 - Concept is done differently with other compilers
- \$INCLUDE is done differently
- Macro expansion does not exist with some other compilers
- Arrays may need some manipulation
- Record structures
- Sharing file IDs (FDs as Intrinsic parameters)

■ Externals

- Passing of parm and info in run command
- File equations
- SORT files
- Entry points
- CIERROR
- Job/session environment (e.g. Temp files)

Migration Issues

■ Programming ethics

- 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 wrappers or automated migration tools as an alternative

Options for HP Cobol MPE-specific concepts

Solutions to the problems



COBOL Compilers

- Microfocus' Server or Net Express
 - Largest market share
 - Can cost a lot with many end-users
 - Compiles into native code
 - Offers screen section for GUI
 - Requires a lot of code changes
 - Migration tools support
- AcuCorp's AcuCobol-GT
 - Very popular in the HP e3000 community
 - Cheaper run-time fees than Microfocus
 - Compiles into OS independent object code
 - Runs on the HP 3000!
 - Offers GUI and SQL interfaces
 - Require very little changes with HP compatibility
 - Migration tools support
- Fujitsu's NetCobol
 - Not as well known but proven
 - No run-time fees
 - Compiles into native code
 - No popular migration tool support
- Legacy J's PerCobol
 - Not very popular; not marketed in the 3000 community
 - Compiles into Java byte code
 - Offers GUI interface
 - No migration tool support except for ViewJ for VPLUS

Main components

- Terminal interface
- Database interface
- Operating System interface

Terminal Interface VPLUS

170.00.170.10 - Reflection for HP

File Edit Connection Setup Script Window Help

CRS HAS/ASE10 SSTGA SACS/Texas SACS/News HPSRC

EMPLOYEE DATABASE [10/03/02]

EMP-NO : [1001]

EMP-NAME : [chandra sekhar]

EMP-ADDR : [1/234, ulsoor road, bangalore]

EMP-PHNR : [5581270]

EMP-SAL : [4444]

JOB DETAILS

DESIGNATION: [software engineer]

PROJECT : []

LOCATION : []

ADD UPDATE CLEAR RETURN

17:39 HP10002 - 128.88.170.10 via TELNET Mum

Start Run.cop Explor Explor 170.00.170.10 telnet2 Microsoft 12:15 PM

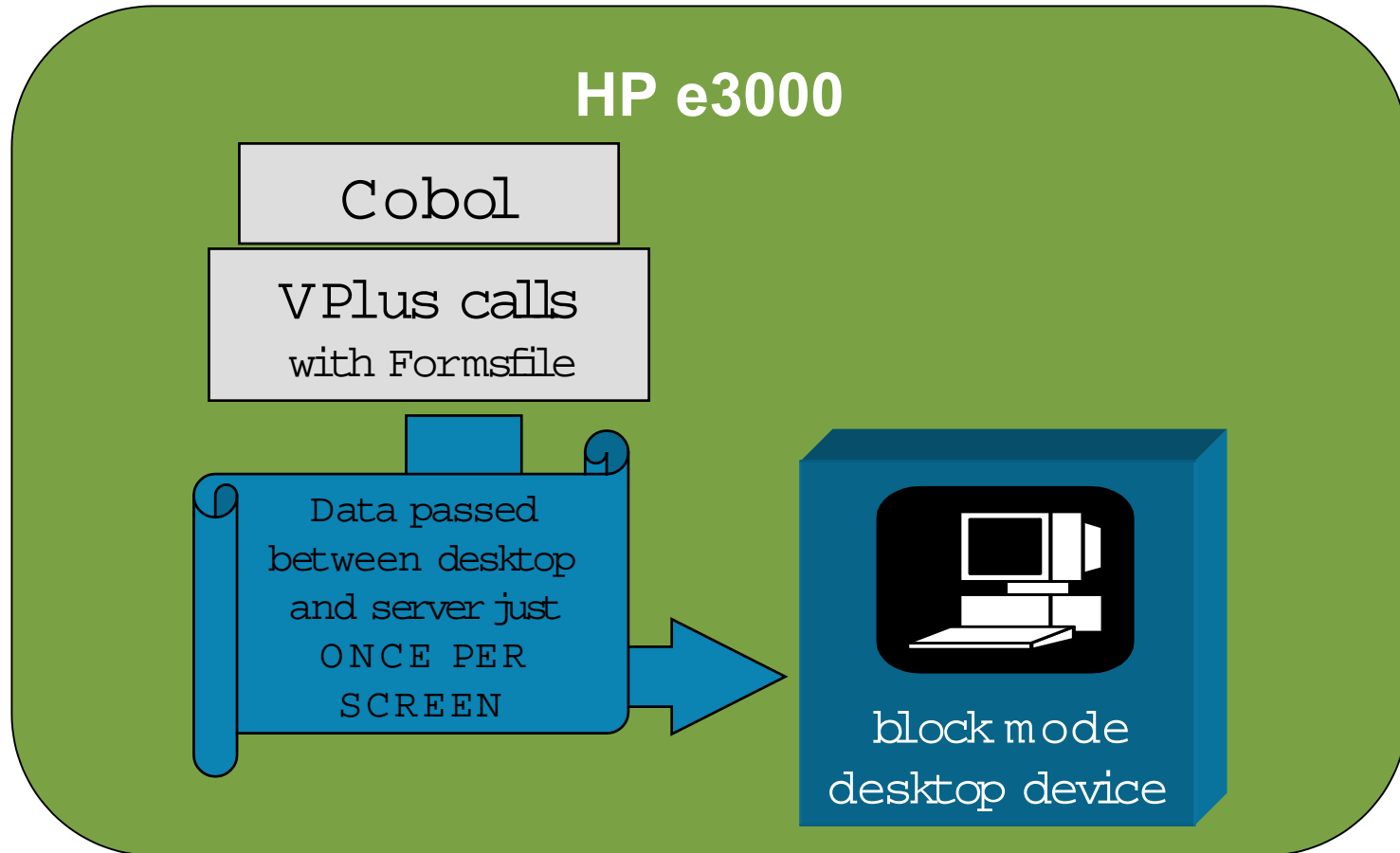
VPLUS compilation errors

VPLUS Intrinsic Calls	Errors or Warnings Encountered with MF
CALL "VOPENTERM" USING COMAREA FILENAME.	173 called program file not found in drive or directory - VOPENTERM
CALL "VOPENFORMF" USING COMAREA filename.	173 called program not found in drive or directory - VOPENFORMF
CALL "VGETBUFFER" USING COMAREA BUFFER-FRM1 DATABUFLEN	173 called program not found in drive or directory - VGETBUFFER
CALL "VERRMSG" USING COMAREA MSGBUF MSGBUFLN ERRMSGLEN	173 called program not found in drive or directory - VERRMSG
CALL "VPUTWINDOW" USING COMAREA MSGBUF MSGBUFLN	173 called program not found in drive or directory - VPUTWINDOW
CALL "VGETNEXTFORM" USING COMAREA.	173 called program not found in drive or directory - VGETNEXTFORM
CALL "VINITFORM" USING COMAREA	173 called program not found in drive or directory - VINITFORM
CALL "VFIELDEDITS" USING COMAREA	173 called program not found in drive or directory - VFIELDEDITS
CALL "VSHOWFORM" USING COMAREA	173 called program not found in drive or directory - VSHOWFORM
CALL "VREADFIELDS" USING COMAREA	173 called program not found in drive or directory - VREADFIELDS
CALL "VPUTBUFFER" USING COMAREA BUFFER-FRM1 DATABUFLEN.	173 called program not found in drive or directory - VPUTBUFFER
CALL "VCHANGEFIELD" USING COMAREA WS-VPLUS-FIELD-SPECS WS-VPLUS-NUM-ENTRIES.	173 called program not found in drive or directory - VCHANGEFIELD
CALL "VFINISHFORM" USING COMAREA.	173 called program not found in drive or directory - VFINISHFORM
CALL "VCLOSEFORMF" USING COMAREA.	173 called program not found in drive or directory - VCLOSEFORMF
CALL "VCLOSETERM" USING COMAREA.	173 called program not found in drive or directory - VCLOSETERM

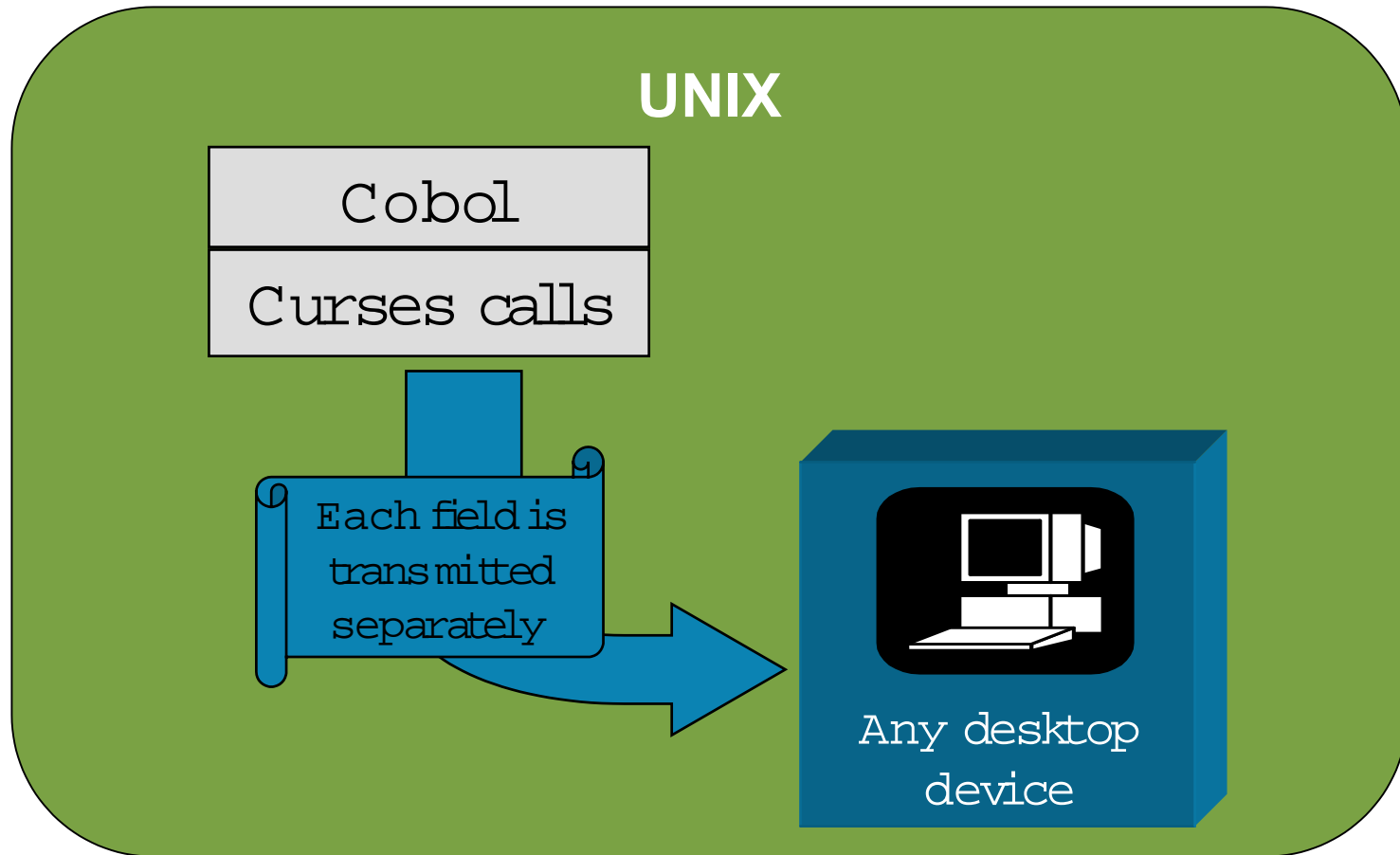
Terminal interface

- VPLUS conversion
 - Emulation vs. Migration
 - Long term maintenance of emulation
 - Migration
 - Tools can migrate forms and formsfile processing specs to other concepts
 - Once migrated, no use for FORMSPEC util.
 - Some tools offer VPLUS intrinsics mapper
- Character mode conversion
 - Compiler compatibility vs. Migration
- Interested in GUI?
 - Web, Client / Server, VB, Java, etc.
 - Some compilers offer GUI and Web options
 - 3rd party software offer GUI and Web interfaces

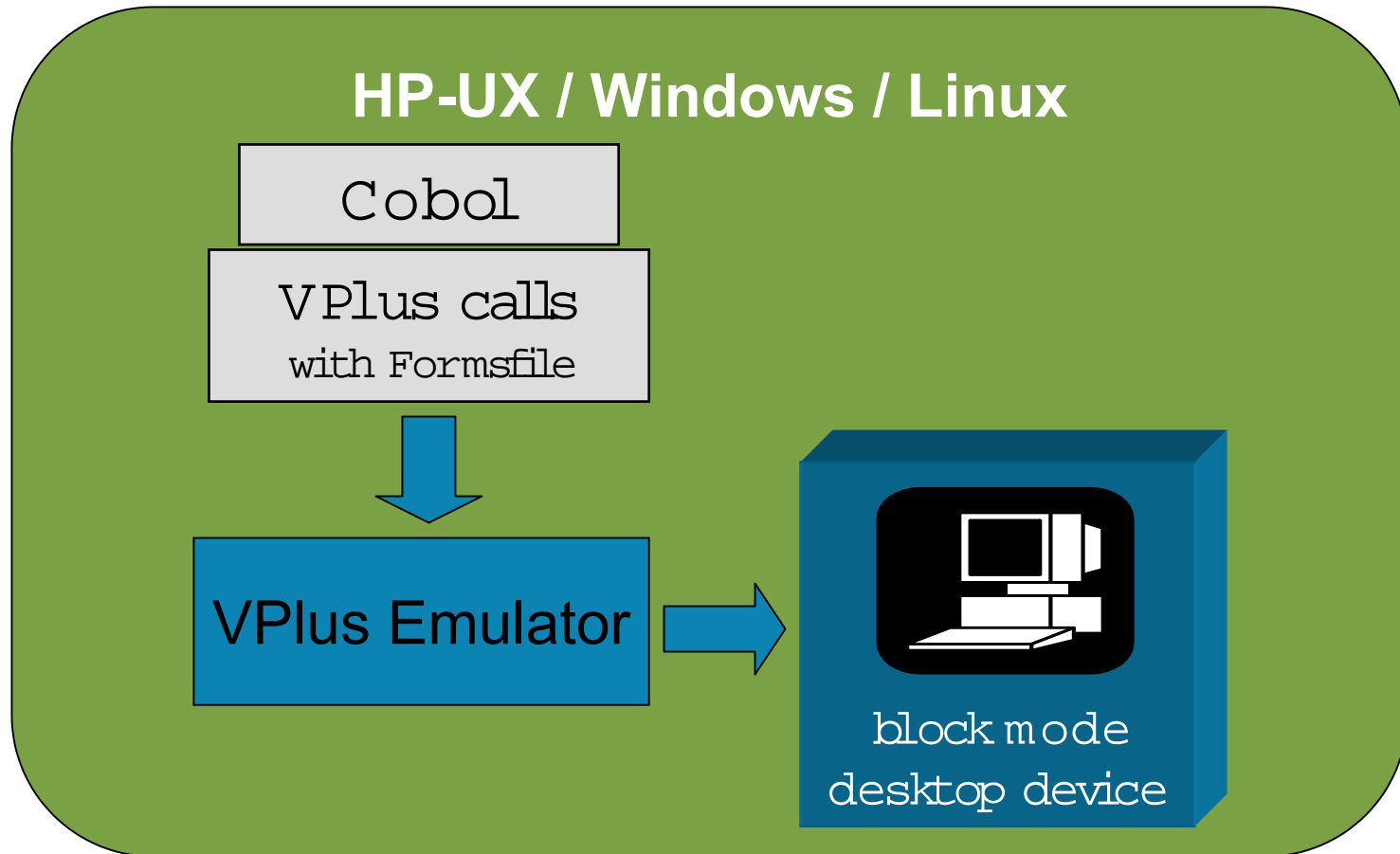
VPlus Overview



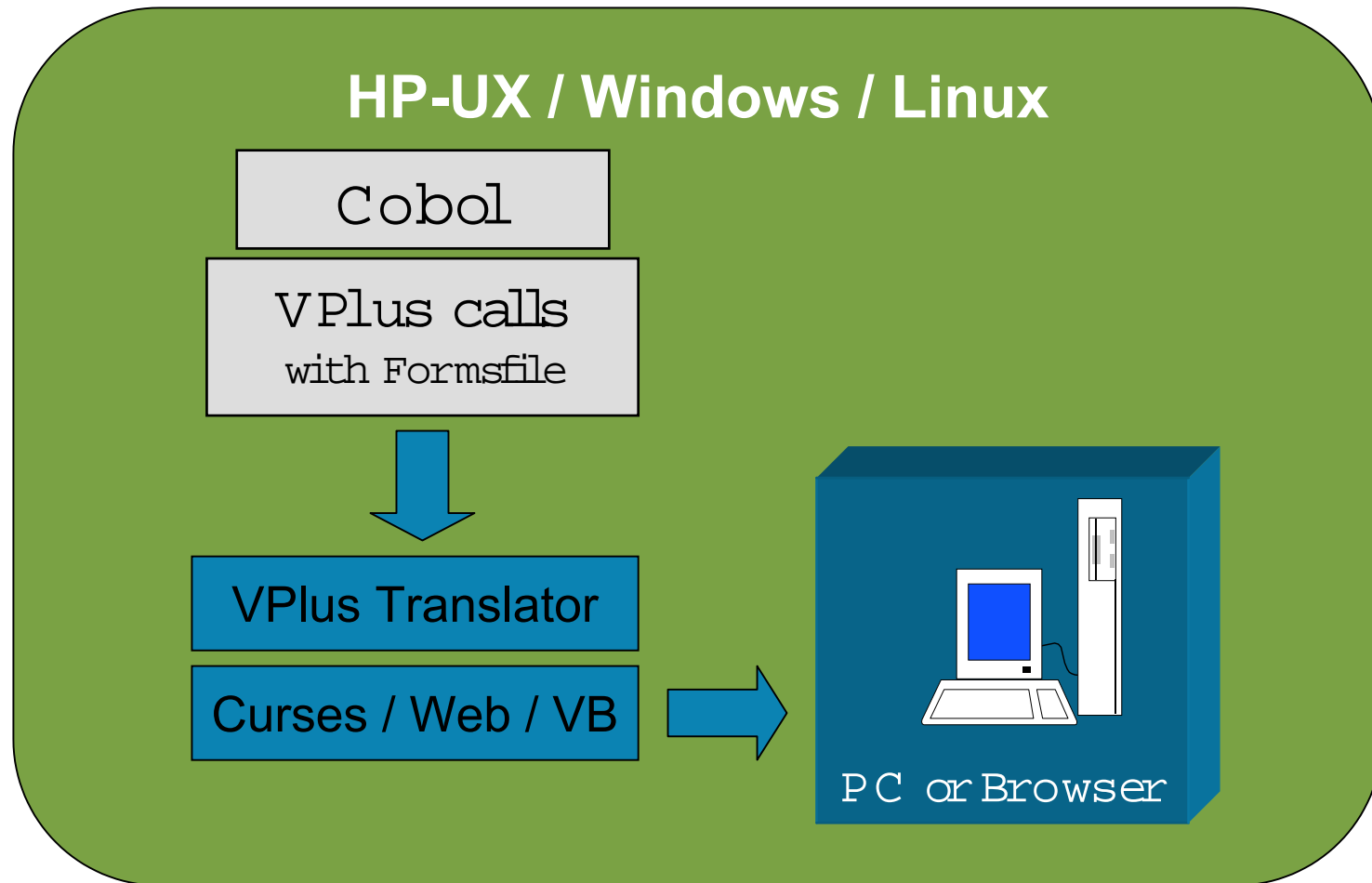
Character Mode on Unix Overview



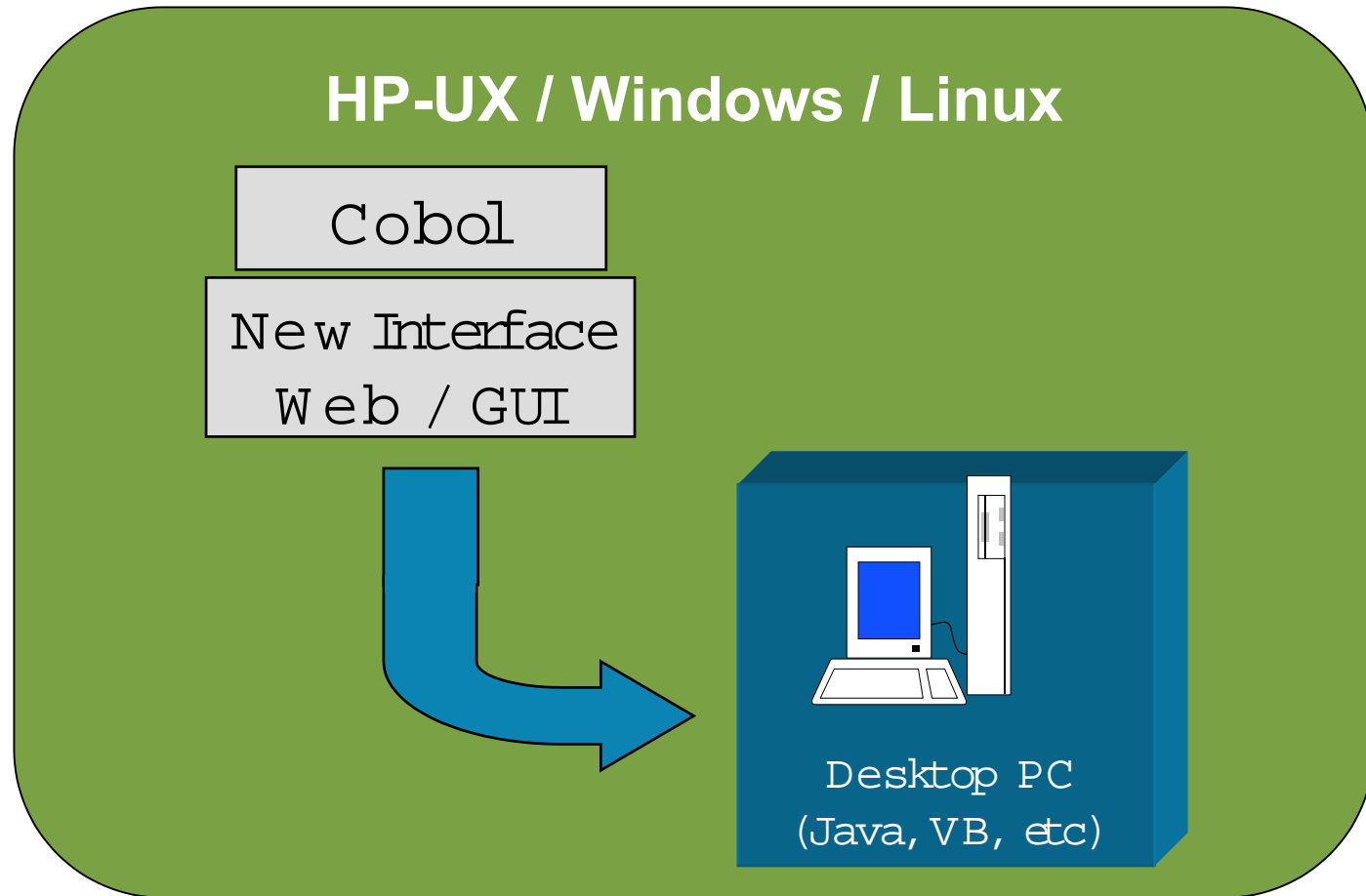
Option 1: VPlus Emulation



Option 2: VPlus Interception / Translation



Option 3: VPlus Replacement



User Interface Options & Alternatives

- Compiler-specific options
 - Some compilers offer their own terminal interface
 - AcuCobol's AcuBench suite
 - MicroFocus's Server/Net express screens
 - Without a converter, expect a significant conversion effort to migrate forms and code
 - Automated solutions exist for AcuBench
 - Screenjet (Screenjet) - intrinsic wrapper available
 - Re-host it (AD Technologies)
- VPLUS conversion tools
 - all offer character-based, GUI and Web
 - Ordina-Denkart's Edwin
 - Cheops' LookVP (Mostly marketed in Europe)
 - Others
 - Legacy J's ViewJ for PerCobol
 - Sungard BI-Tech's XFORM
 - Transoft's Intelligent Adapters
 - Advanced Network Systems' VPLUS adapters
 - Robust Systems' VB-VIEW
 - eXegeSys' client
- Windows: Visual Basic or .Net native GUI

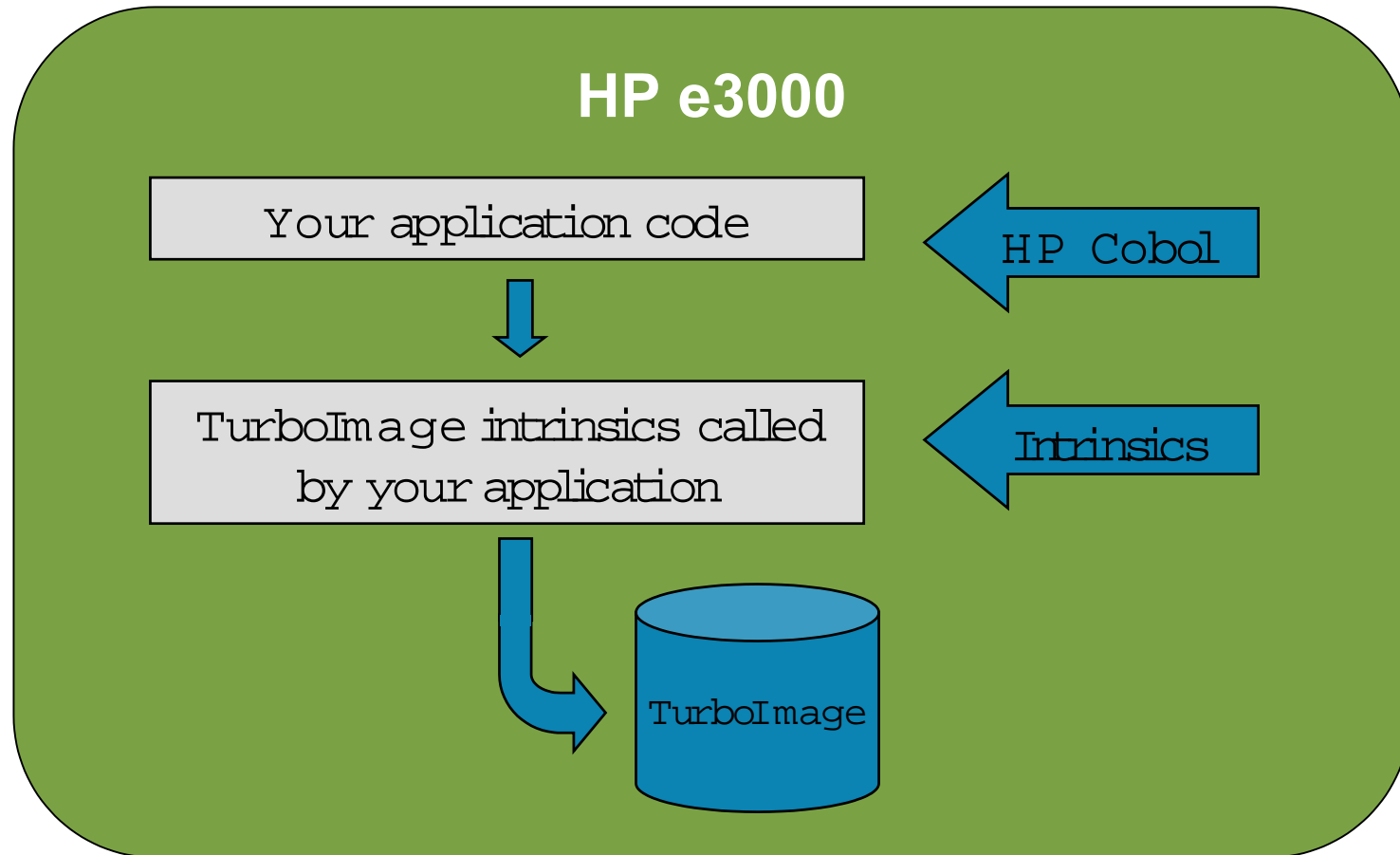
Databases & Files Interface

Database & files interface Options

- Use Image look-alike: Eloquence
 - Fastest and cheapest solution
 - Proven solution
- Use intrinsics-wrapper to access RDBMS
 - Intrinsics are untouched
 - Quickest way to migrate
 - Cheaper than converting to embedded SQL
- Convert intrinsics to embedded SQL or native RDBMS statements
 - Intrinsics are converted to embedded SQL
 - More expensive and time intensive than wrapper

Database & files

How it works today



Database & files interface

Image clone option

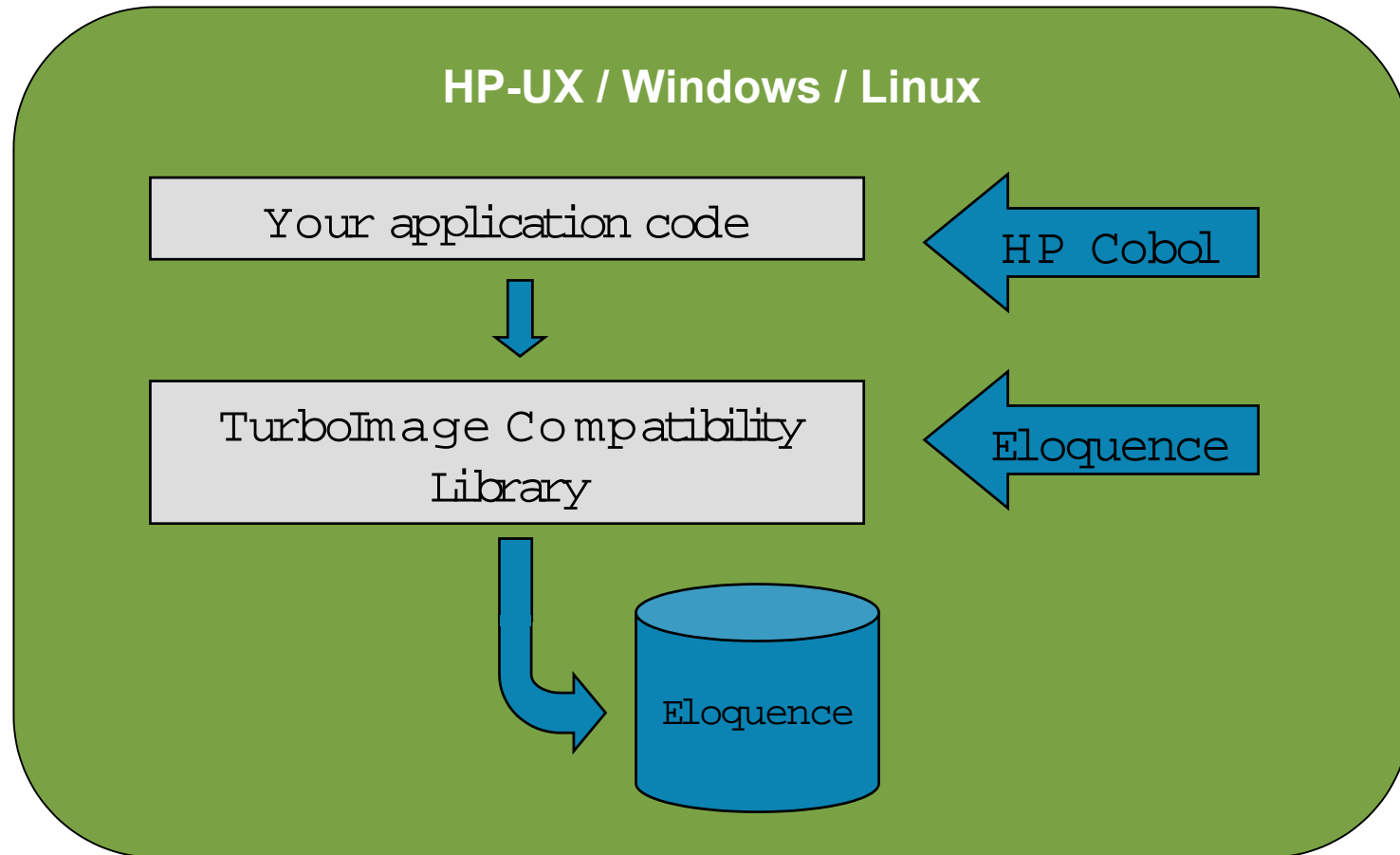
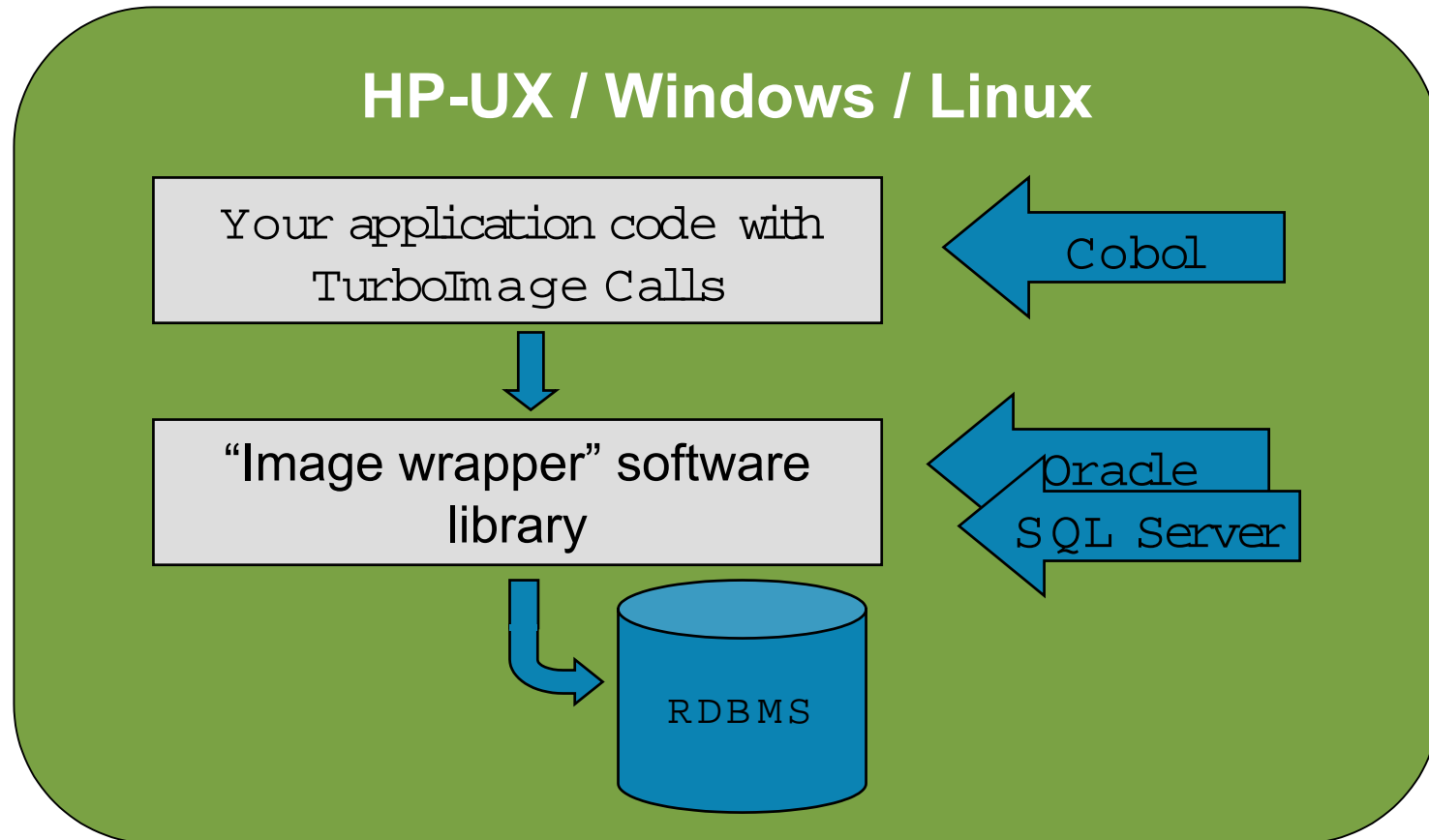


Image clone: Marxmeier's Eloquence

- 95% of Image functionality
- Extremely popular with e3000 companies contemplating a migration
- Known as “Low cost & little effort” migration solution
- No code change required, includes Image intrinsic library
- Ideal for up to 500 concurrent users
- Performance is .5 times slower than Image
- Interesting to small/medium sized companies as well as ISVs
- Many vendors are or will soon be supporting Eloquence
- Supports partial key retrieval
- DISC's Omnidex can now complement it
- 2000-5000 customers worldwide
 - ~200 using Image intrinsic interface
- ~\$8.5K per server + support

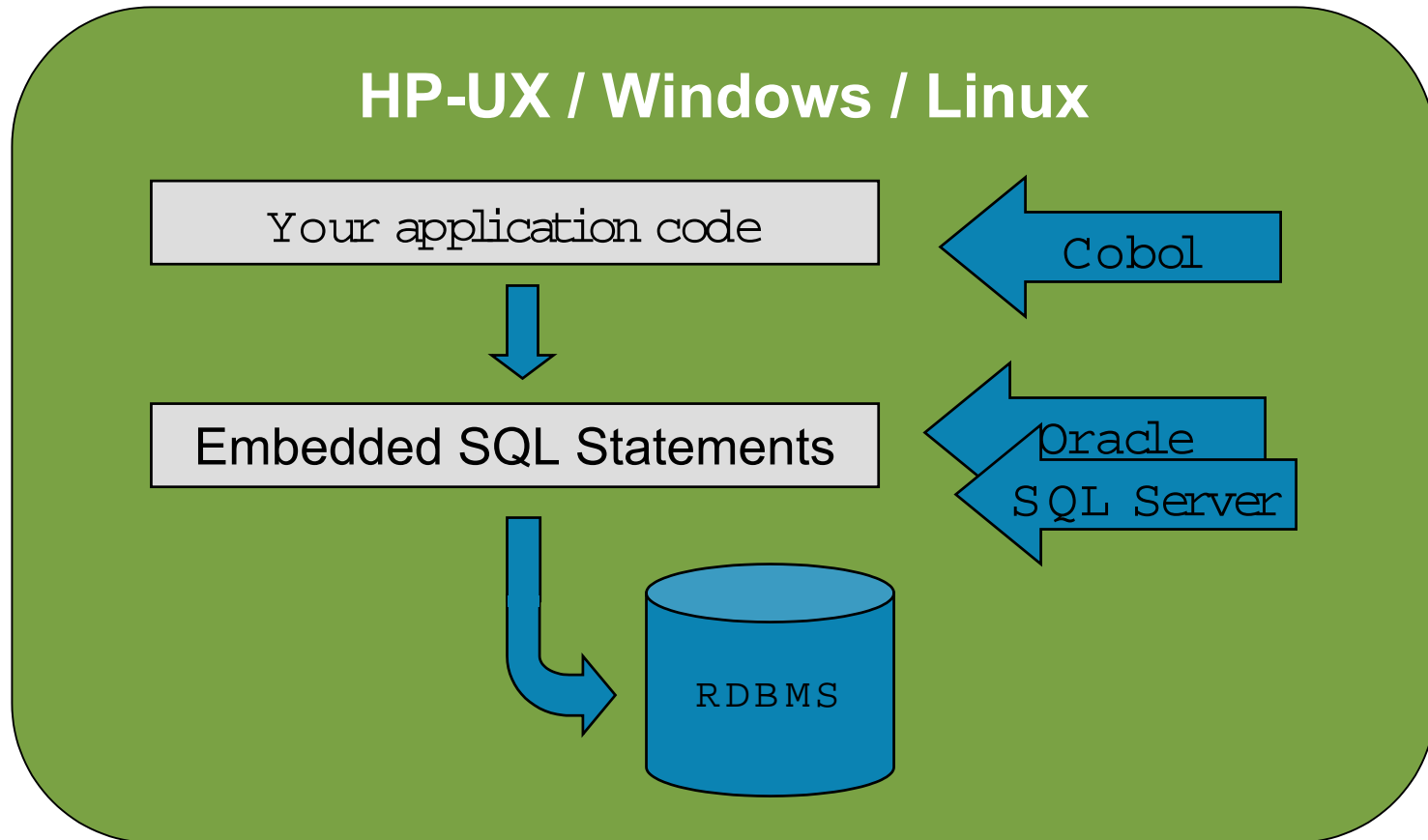
Database & files interface

Image Wrapper Option



Database & files interface

Redesign Option



Database & files interface

Database migration 101

- Use a proven method: replicate structure; don't enhance it
- Use an efficient migration tool
 - Taurus's Bridgeware
 - Speedware's DBmotion
 - Others
 - UDACentral (MB Foster), ImaxSoft, VitalSoft, DISC, WRQ, etc.
 - COBOL migration solution methods
- Caveats
 - Powerhouse dictionary

Database & files interface

Database migration 101

- Replacing Image creates new challenges
 - Data Structure Changes
 - Data Type Changes
 - Variable Name Changes
 - Database / File Access Changes
 - Data Migration
 - Application code changes

Database & files interface

Database migration 101

- Other challenges
 - Arrays
 - Dates
 - Dirty data
 - Omnidex / Superdex
 - Integers on CISC platforms

Operating System Interface

OS Interaction

- Examples of areas that need attention
 - Calls of OS Intrinsics
 - Executing OS Commands
 - File equations
 - UDC utilization
 - JCL code
 - System variables
 - Interaction with spoolers
 - Interaction with Jobs
 - Interaction with forms
 - Interaction with hardware devices

OS Interaction

■ Options

- 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
 - Some vendors offer this capability
 - Some 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 but it is usually cheaper than a manual approach

Automated COBOL Migration Solutions

How to save time and money...



What direction can you take?

- Convert your HP COBOL to C, Java or .Net
 - Automated tools exist
 - Tools are not popular; infancy state
 - No solution for MPE specifics
- Migrate your HP COBOL code
 - Automated tools exist
 - Tools are proven and robust
 - Some tools offer an emulation solution for MPE specifics, others a conversion solution

Why consider a COBOL migration solution?

- Transition off the HP e3000 faster and cheaper than doing it manually
- Most cost-effective solutions use MPE emulation
 - Cheaper than manual conversion
 - Cheaper than automated conversion to native statements

Why consider a COBOL migration solution ?

- Converts
 - Syntax
 - Statements
 - Concepts
 - OS concepts
 - OS intrinsics
 - DB intrinsics
 - DB migration
 - VPLUS forms

3GL Migration Solutions

Cobol	Neartek, Denkart, 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 (Neartek's AMXW) SPL to C converter (Denkart)
C	Denkart with MPUX

3GL Migration Tools

- 4 HP-validated migration solutions
 - Neartek
 - Migration tools, packaged and sold as a toolset.
 - Denkart
 - ASP model of migration, charged by number of lines of code, 95% migrated
 - Many 3GL options
 - 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
- Others
 - AD Technologies and other companies

Neartek's **AMXW**

Automated Migration to
uniX and Windows



Neartek's AMXW

- AMXW...
 - Modifies COBOL code so that it is compatible with Microfocus or AcuCobol-GT compilers
 - Includes an MPE Emulation layer for OS intrinsics, MPE commands, batch jobs, and other MPE utilities.
 - Includes Image Intrinsic wrapper
 - Includes a tool to migrate Image, KSAM, Flat and Allbase databases. Also supports Eloquence.
 - Combine with EdWin (from Ordina-Denkart) or LookVP (Cheops) for VPLUS migration
- Migration of HP COBOL and other 3GLs
 - HP Cobol 85 to AcuCobol-GT and Microfocus (HPUX, Windows, Sun, Linux, AIX)
 - HP Fortran 77 to Fortran 77 on Unix
 - SPL to C (also C & PASCAL)
 - Image/Ksam/Flat/Allbase to Eloquence, Oracle, SQL Server, DB2 (ti2SQL), Informix, Ingres, etc.
- Solution is based on a tool
 - Ideal for customers that want to do it themselves
 - Most cost-effective do-it-yourself automated solution
 - Price is based on number of lines of code to be migrated per application and number of CPUs of target server
- Proven solution, used many years by multiple companies
 - Profile: Expeditors (Manages cargo; 167 e3000s, platform undecided, “most extensive MPE emulation tool”, MicroFocus, “single set of source code”)

Snapshot example

ExamDiff

Files View Navigation Search Info

Diff 45: Change line 1502 (left file) to line 1560 (right file)

E:\NEARTEK\Tmp\Z077C0CQ.mpe

```
15212 291-sel-ap-kst-seriell-ex.  
15213 *-----  
15214     exit.  
15215 *  
15216 *  
15217 291-sel-ap-gpr section 02.  
15218 *-----  
15219 *  
15220 * pruefung ob mit @ wenn ja wird b077-d2 seriell geles  
15221 * wenn nein find und get  
15222 * -----  
15223     move zero to zlr-anzahl.  
15224     inspect maske-04-gpr tallying zlr-anzahl for all  
15225 *  
15226     if zlr-anzahl > 0  
15227         perform 291-sel-ap-gpr-seriell  
15228     move vflus-2831KE1-0A+E-TU-VPLU3-LR31KE1.  
15229 *  
15230 HPPGM-904-MASKBUFF-EINL-EX.  
15231 *  
15232     move maske-04-gpr to b077-arg-003.  
15233     %dbfind(b077-name#,b077-set-d2#,b077-si-003#,b077
```

E:\NEARTEK\Tmp\Z077C0CQ.mig

```
22896 291-SEL-AP-KST-SERIELL-EX.  
22897 *-----  
22898     EXIT.  
22899 *  
22900 *  
22901 291-SEL-AP-GPR SECTION 02.  
22902 *-----  
22903 *  
22904 * pruefung ob mit @ wenn ja wird b077-d2 seriell geles  
22905 * wenn nein find und get  
22906 * -----  
22907     MOVE ZERO TO ZLR-ANZAHL.  
22908     INSPECT MASKE-04-GPR TALLYING ZLR-ANZAHL FOR ALL  
22909 *  
22910     IF ZLR-ANZAHL > 0  
22911         PERFORM 291-SEL-AP-GPR-SERIELL  
22912     MOVE vFLUS-2831KE1-0A+E-TU-VPLU3-LR31KE1.  
22913 *  
22914 HPPGM-904-MASKBUFF-EINL-EX.  
22915 *  
22916     MOVE MASKE-04-GPR TO B077-ARG-003.  
22917 * Start macro DBFIND  
22918     CALL "DBFIND" USING B077-NAME  
22919                         B077-SET-D2  
22920                         MODE1  
22921                         STATUS-FELD  
22922                         B077-SI-003  
22923                         B077-ARG-003;  
22924 *  
22925     IF CALL-NOT-OK  
22926         MOVE B077-NAME TO U002-DB-NAME  
22927         MOVE B077-SET-D2 TO U002-DB-DSET-NAME  
22928         MOVE B077-ARG-003 TO U002-DB-SCHLUESSEL  
22929         MOVE STATUS-FELD TO U002-DB-STATUSFELD  
22930         CALL "U002DB" USING U002-DB-BUFFER  
22931                             VPLUS-COMAREA  
22932                             VPLUS-TERMFILE  
22933 *  
22934     MOVE "9" TO KZ-FEHLER.  
22935 * End macro DBFIND  
22936 *  
22937     IF NOT CALL-OK OR KEIN-EINTRAG  
22938         GO TO 291-SEL-AP-GPR-EX.  
22939 *  
22940
```

989 differences found

Sharing

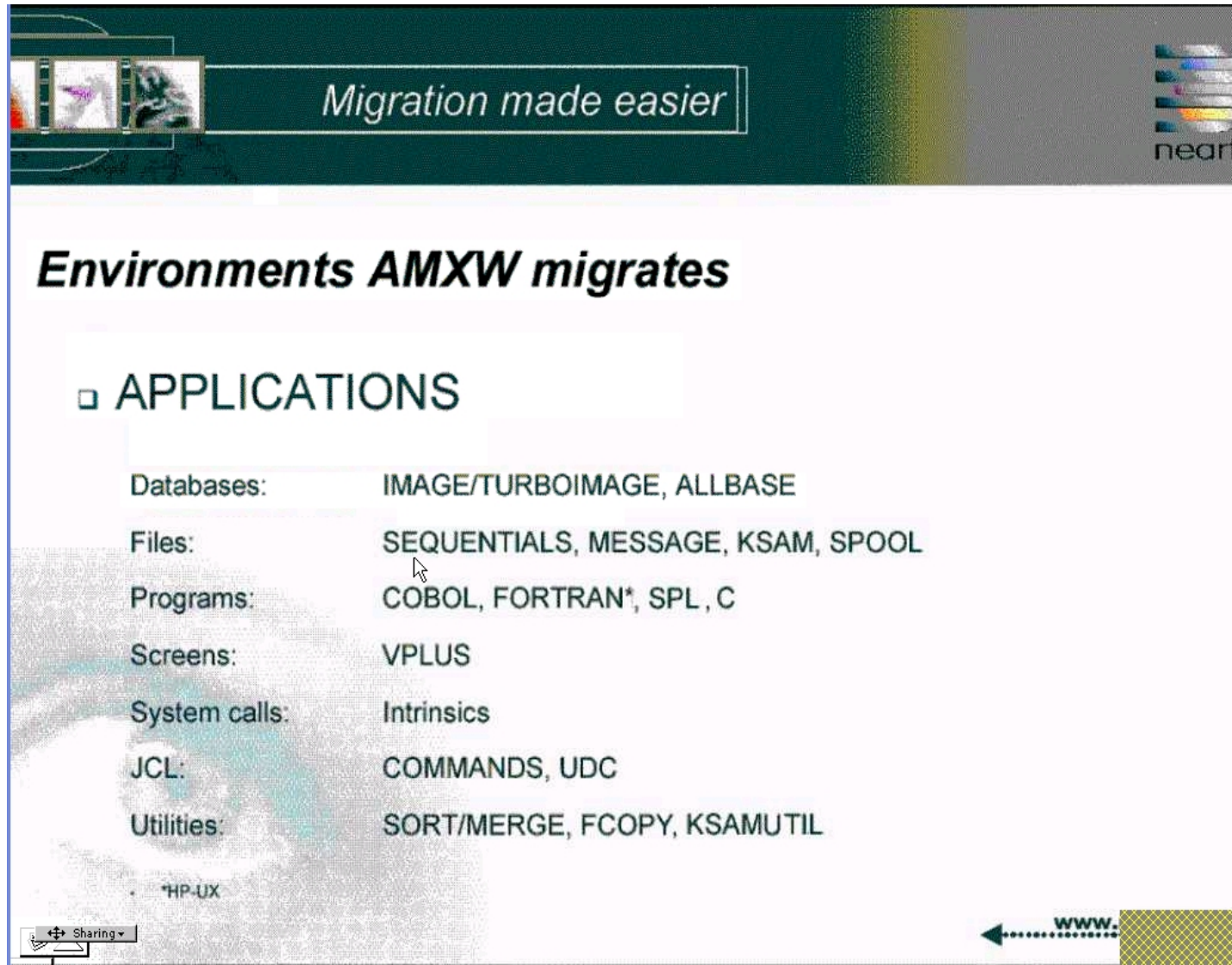
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Démarrer Web... Meeti... Shar... Appli... Navi... Untitl... SQL... C:\W... Exam...

Product demo

- Time permitting in session...
- or come to Speedware's booth # 207

Complete COBOL migration solution



The slide features a dark green header with the text "Migration made easier" in a white box. Below the header, the title "Environments AMXW migrates" is displayed in a bold, italicized font. Underneath the title, the word "APPLICATIONS" is preceded by a square bullet point. A list of application categories and their supported formats follows, with a mouse cursor pointing at "SEQUENTIALS". At the bottom left, there is a small "Sharing" icon, and at the bottom right, a "www." logo with an arrow pointing left.

Migration made easier

Environments AMXW migrates

□ APPLICATIONS

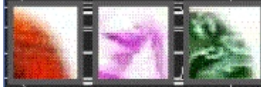
Databases:	IMAGE/TURBOIMAGE, ALLBASE
Files:	SEQUENTIALS, MESSAGE, KSAM, SPOOL
Programs:	COBOL, FORTRAN*, SPL, C
Screens:	VPLUS
System calls:	Intrinsics
JCL:	COMMANDS, UDC
Utilities:	SORT/MERGE, FCOPY, KSAMUTIL

*HP-UX

Sharing

www.

MPE Intrinsic



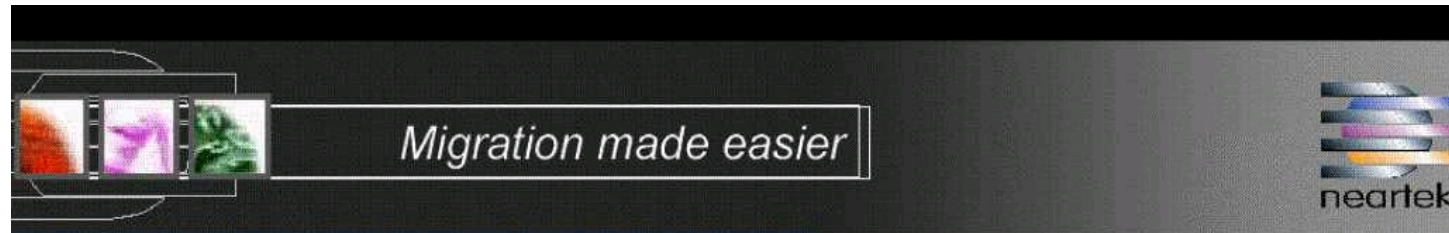
Migration made easier



AMXW Simplicity

- ❑ Most system calls (intrinsics) developed with common parameters
 - ❑ **IMAGE** (*Dbbegin, Dbclose, Dbdelete, Dbend, Dberror, Dbexplain, Dbfind, Dbget, Dbinfo, Dblock, Dbopen, Dbput, Dbunlock, Dbupdate*)
 - ❑ **KSAM** (*Ckclose, Ckdelete, Ckerror, Cklock, Ckopen, Ckopenshr, Ckread, Ckreadbykey, Ckrewrite, Ckstart, Ckunlock, Ckwrite*)
 - ❑ **FILES** (*Fcheck, Fclose, Fcontrol, Fdelete, Fermsg, Ffileinfo, Fgetinfo, Flock, Fopen, Fpoint, Fread, Freadbackward, Freaddir, Freadlabel, Freadseek, Frename, Fsetmode, Fspace, Funlock, Fupdate, Fwrite, Fwritedir, Fwritelabel, Genmessage, Iodontwait, Iowait, Print, Printfileinfo, Read, Readx*)
 - ❑ **PROCESS** (*Activate, Create, Createprocess, Father, Getprocid, Getprocinfo, Kill, Quit, Suspend, Terminate*)
 - ❑ **COMMANDS** (*Command, Hpcicommand, Mycommand*)

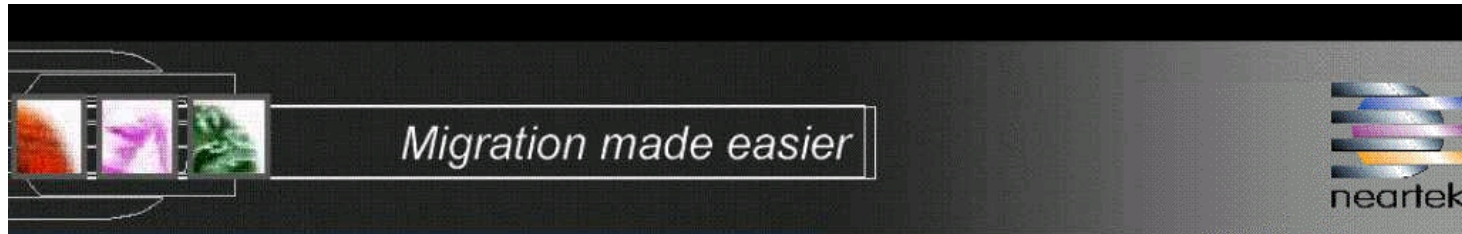
MPE Intrinsic



AMXW Simplicity

- ❑ Most system calls (intrinsic) developed with common parameters
 - ❑ **RESOURCES** (*Dmovin, Dmovout, Freedseg, Mail, Receivemail, Sendmail, Freelocrin, Getlocrin, Locklocrin*)
 - ❑ **ENVIRONMENT** (*Findjcw, Getjcw, Hpcigetvar, Hpciputvar, Putjcw, Setjcw*)
 - ❑ **OTHERS** (*Ascii, Binary, Calendar, Clock, Ctranslate, Dascii, Dateline, Dbinary, Fmtcalendar, Fmtclock, Fmtdate, Pause, Printop, Printopreply, Proctime, Search, Who*)
 - ❑ **Presentation:** shared libraries (Unix/Linux) or dll (Windows)
 - ❑ **Performances:** written in C. Some tests (Pitney Bowes) show our Oracle database calls are 3 times faster than those rewritten using sql
 - ❑ **Debug:** intrinsic calls can be logged depending on the variable environment
 - ❑ **Versatility:** Neartek can develop any new intrinsic or option that is not currently ported

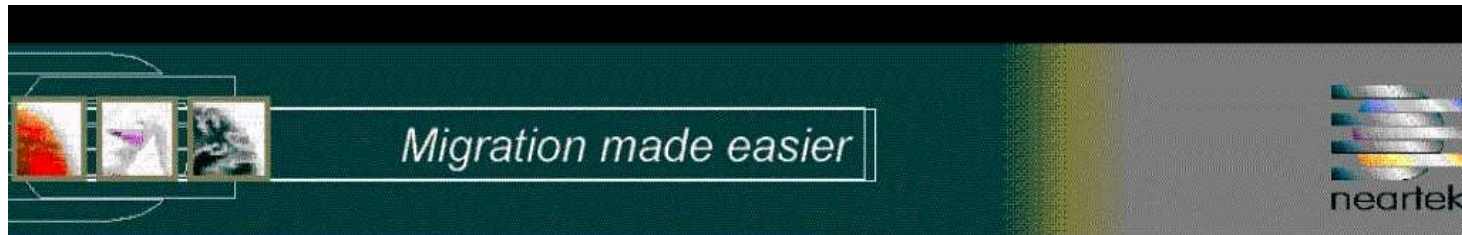
MPE Commands



AMXW Simplicity

- ❑ Most CI commands developed with common parameters
 - ❑ **FILES FILES** (*Build, File, Listf, Listftemp, Purge, Rename, Reset, Save*)
 - ❑ **PROCESS** (*Run*)
 - ❑ **BATCH/SESSIONS** (*Stream, Job, Showjob*)
 - ❑ **ENVIRONMENT** (*Stejcw, Setvar, Listf, Listftemp, Purge, Rename, Reset, Save, Showjcw*)
 - ❑ **CI/UDCS** (*CommandFiles, Continue, Else, Endif, Eod, Eoj, Help, If, Recall, Reply, Showcatalog, Tellop*)
 - ❑ **OTHERS** (*Comment, Listacct, Listgroup*)
- ❑ **Transparency:** JCLs from jobs are translated with a few modifications because these commands are interpreted with a special shell named 'nlsh'
- ❑ **Opening:** The 'nlsh' shell is not only able to execute native commands from HP3000, but also commands from the target OS (including command files)
- ❑ **Extensions:** the print commands have a 'user exit' making it possible to call a shell script from the print command (you can write the file to a CD-ROM, to send it via email, printing it, etc.) With Unix or Linux (Linux Is Not UniX), every command from these OS's has these native possibilities.
- ❑ **Versatility:** Neartek can develop any new command or option that is not currently ported

Proven solution: References



AMXW Success

□ References

□ ISVs (software editors)

ARES, CIRIL, DATASTREAM, EDS-GFI, IMPULSION, ORDAT, RCS, TJ-SYSTEMS, UNILOG

□ Companies that migrated their own sources:

PITNEY BOWES, TEFAL

□ Customers using AMXW

ALEXANDER BINZEL GMBH, AUTOPRATIC, BRODARD GRAPHIQUES, BROSE, BUZIL, BVA, CGEP, CHAPELLE DARBLAY, COHLIN, DALIM, DETIA, DHW, DOLE, DUNLOP, EHLEBRACHT, EMIG GMBH & Co, EOSA, FRANCELOG, GTI, HELIO-CORBEIL, HAL, HELLA, HETTICH, HUTTENES ALBERTUS GmbH, ICI, IMSS, IMV, INOTECH, INOPLAST, KRUPP AUTOMOTIVE SYSTEMS GMBH, LA ROCHETTE-VENIZEL, LEMM, LUXOPLAST, MONTAVIT, NASCO, OTOR, PAD, PIAZZA, QUATP, RADSYSTEM GMBH, SACRED, SAS, SAXONIA, SCHI, SEB, SECURIT ST GOBAIN, SOPELEM, TJ SYSTEMS, VALOUREK, VAMAV, VENTREX, WALTER MADER AG, WERKSTOFF, WOESTE, ZALTECH, ZEIT,...

Ordina-Denkart's ViaNova 3000

Outsource-based,
automated and
re-engineering solution



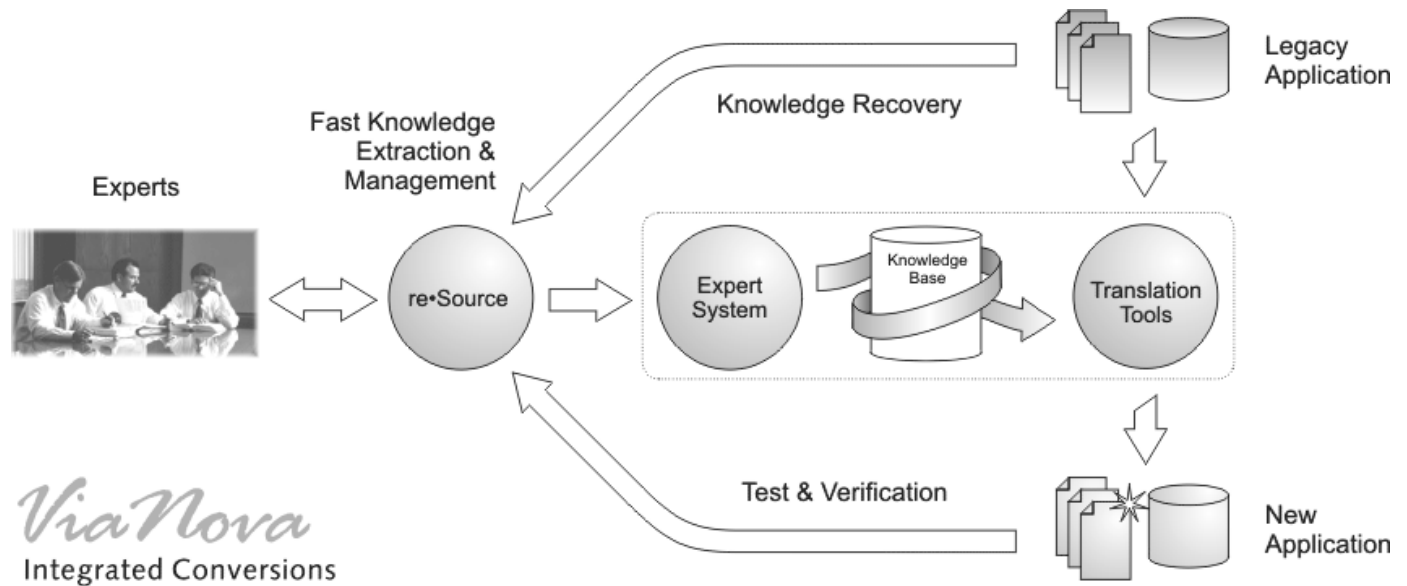
Ordina-Denkart

- ViaNova 3000, plus
 - WingSpan – VPlus emulation on non-MPE systems
 - EdWin – Graphical interface for VPlus emulation
 - ORDAT's ti2SQL used for DB migration and intrinsic wrapper
 - MPUX – MPE Emulation layer
 - Complete and proven
 - Includes support for OS intrinsics, MPE commands, batch jobs and management, spooler, and other MPE utilities.
- Migration of multiple 3GLs
 - To many platforms, incl. HP-UX and Windows
 - HP Cobol to Microfocus Cobol
 - Working on AcuCobol option
 - Fortran 77 to Fortran 77
 - Fortran to C/C++
 - Pascal to C++
 - C to C/C++
 - SPL to C/C++

Key Concepts of ViaNova 3000

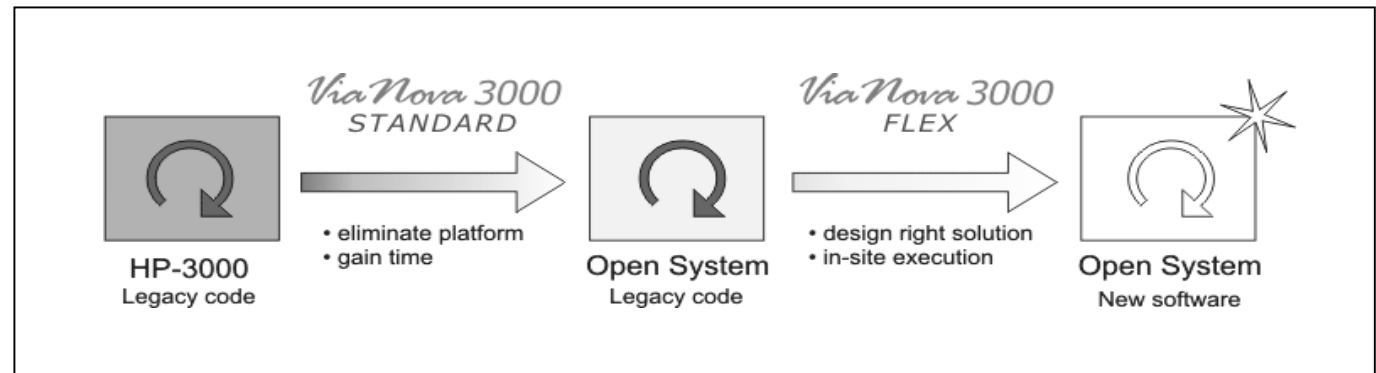


The ViaNova 3000 Tool chain



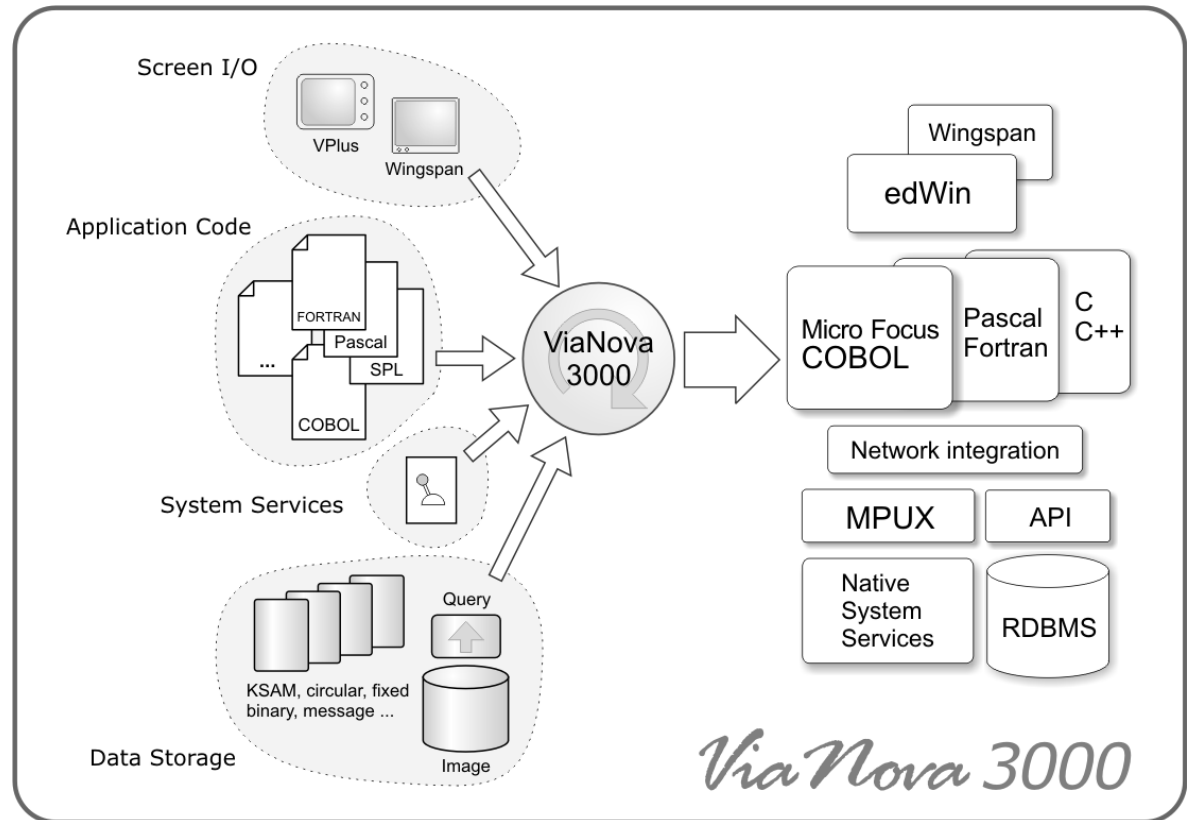
ViaNova 3000

An end-to-end solution



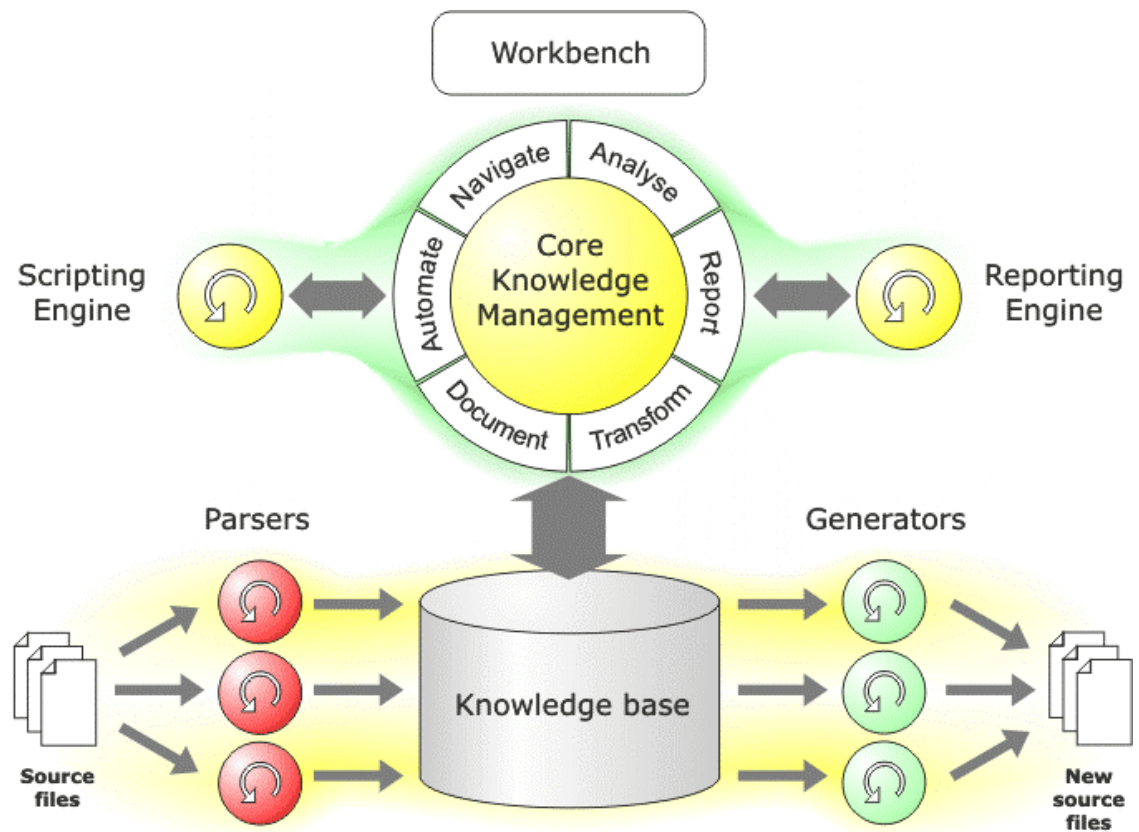
- For platform migrations, re-engineering or both
- Uses specialized migration tools & products
- Go *OPEN* without waste of *TIME* (or resources)

ViaNova 3000 Standard Roadmap



ViaNova 3000 Flex

core technology



Ordina-Denkart

- Solution is sold in a remote service model
- 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
- Also looking to package their tool for interested clients (on request)

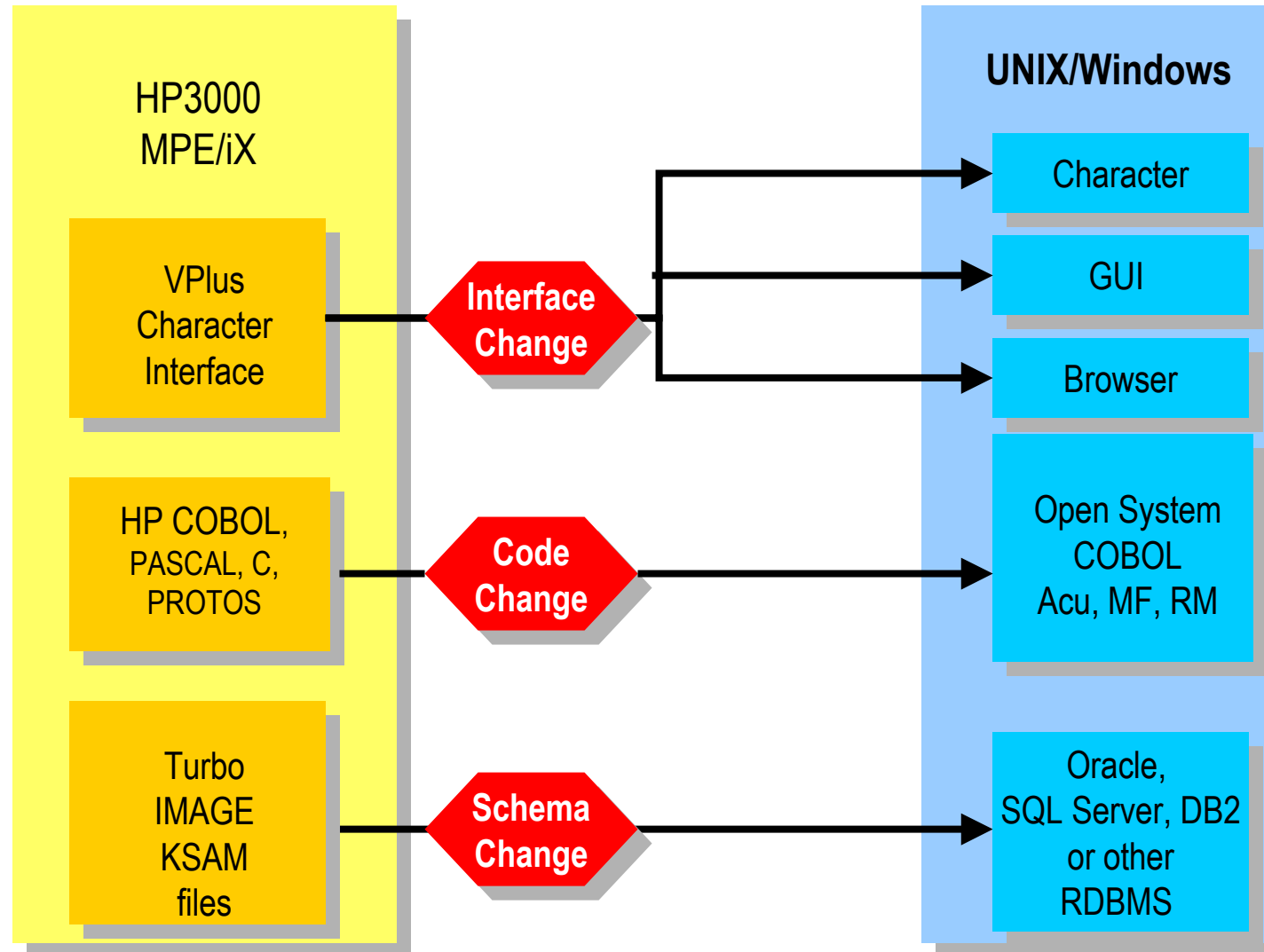
Other COBOL migration solutions



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

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

Pricing

- Ordina-Denkart's ViaNova 3000
 - No. lines of code
 - No. runtime users (MPUX, EDWIN & ORDAT)
 - Yearly support for MPUTX
- Neartek's AMXW
 - No. lines of code (per source server or per enterprise license)
 - No. CPU on target server
 - 1st year support included
 - Support includes “right-to-use” and maintenance (yearly fee)
- Transoft's Intelligent adapters
 - No. lines of code
 - Code complexity evaluation
 - Components costs

Criteria

- 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's AMXW can be outsourced to a partner to provide a 100% solution.

Criteria

- Solution is based on what best fits the customers needs
 - Customer wants lowest cost
 - Best fit: Neartek's AMXW (in-house or outsourced); especially if you have lots of code to migrate
 - 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 as 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.

Example of Cost difference

- Case study 1 (1 App/Server, 500,000 LOC, 50 users, Eloquence, migrated to Itanium 1-way server)
 - *AMXW: \$35K
 - AMXW: \$25K
 - Edwin: \$10K
 - **Ordina-Denkart: \$84K
 - ViaNova 3000: \$54K
 - MPUX: \$20K (can be lower with bundle option)
 - Edwin: \$10K
 - Transoft: Unknown; depends on code evaluation
 - Sungard BI-Tech: Unknown; depends on code evaluation

•All amounts approximated & based on reseller list prices

•* Assumed tool is used by client. Includes one year support.

•** Assumes solution is outsourced. Support is 15%.

Example of Cost difference

- Case study 2 (1 App/Server; 2,000,000 LOC, 200 users, Eloquence, migrated to Itanium 2-way server)
 - *AMXW: \$68K
 - AMXW: \$47K
 - Edwin: \$21K
 - **Ordina-Denkart: \$235K
 - ViaNova 3000: \$171K
 - MPUX: \$43K (can be lower with bundle option)
 - Edwin: \$21K
 - Transoft: Unknown; depends on code evaluation
 - Sungard BI-Tech: Unknown; depends on code evaluation

•All amounts approximated & based on reseller list prices

•* Assumed tool is used by client. Includes one year support.

•** Assumes solution is outsourced. Support is 15%.

Example of Cost difference

- Case study 2 (1 App/Server; 2,000,000 LOC, 200 users, Oracle, migrated to Itanium 2-way server)
 - *AMXW: **\$68K**
 - AMXW: \$47K
 - Edwin: \$21K
 - **Ordina-Denkart: **\$258K**
 - ViaNova 3000: \$171K
 - MPUX: \$43K (can be lower with bundle option)
 - Edwin: \$21K
 - ORDAT: \$23K
 - Transoft: Unknown; depends on code evaluation
 - Sungard BI-Tech: Unknown; depends on code evaluation

•All amounts approximated & based on reseller list prices

•* Assumed tool is used by client. Includes one year support.

•** Assumes solution is outsourced. Support is 15%.

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; only tool available is Neartek's AMXW (on request)
- 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.

- 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
- Neartek's AMXW can be used for C migrations (Includes MPE emulation)

- AD Technologies and Allegro are working on a SPLash compiler for HP-UX / Windows / Linux. (status?)
- There are 2 known migration solutions that will migrate SPL to C
 - ViaNova 3000 (Ordina-Denkart - outsourced)
 - AMXW (Neartek – do it yourself with tool or outsourced)
 - *Both 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 or .Net, however, there are no migration tools

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 “Migration Advisors”
- Don’t under-estimate how many resources a migration 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

