3GL Migration

Speaker name

Title

Hewlett-Packard

Languages

- COBOL (most popular)
- FORTRAN
- Pascal
- SPL
- RPG
- C
- Business Basic

Overview

Breaking down the 3GL migration challenge

HP COBOL

- About HP COBOL
  - An implementation of ANSII standard COBOL, with a few differences and extensions.
- Why you may need a migration tool
  - HP COBOL compiler does not exist on other platforms
  - Technologies referred to by the code do not exist on other platforms
  - Concepts are different on other platforms
  - Significant amount of code and concepts need to be adapted
  - Major investment of time and resources

Challenges of HP COBOL migration

HP e3000 3GL applications are proprietary to MPE/iX

- Issues exist in 4 areas: code, database, OS and user interface
  - Compiler-specific code (Syntax and MPE extensions)
  - Platform-specific code (Database and MPE intrinsics)
  - MPE concepts references (JCL, Message files, file equations, CIERROR, JCW, etc.)
  - User interface/VPLUS replacement
- Database migration

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 or return status
  - 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

User interface

Areas that need attention

- Direct terminal I/O
  - Differences between HP COBOL and other compilers in the way information is displayed
  - Escape sequences and control characters
- VPLUS forms
  - Do not exist on other platforms
  - Covered in “User Interface” presentation

Database/file interface

Areas that need attention

- Database
  - TurboImage: Does not exist on other platforms
    - TurboImage is accessed with HP Image intrinsics (lots of them)
    - 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: HP-UX support ends in Dec 2006
  - Omnidex/Superdex
- File system
  - File naming (FILE.GROUP.ACCT)
  - Cobol statements or intrinsics
    - Cobol statements: OPEN,READ,WRITE
    - Intrinsics: FOPEN, FREAD, FWRITE, etc.
  - MPE file access: Sequential, Message, Circular, Temporary, RIO, Byte-Stream
  - KSAM files
    - Accessed using Cobol statements, Fxxxx or CKxxxx intrinsics

How it works today

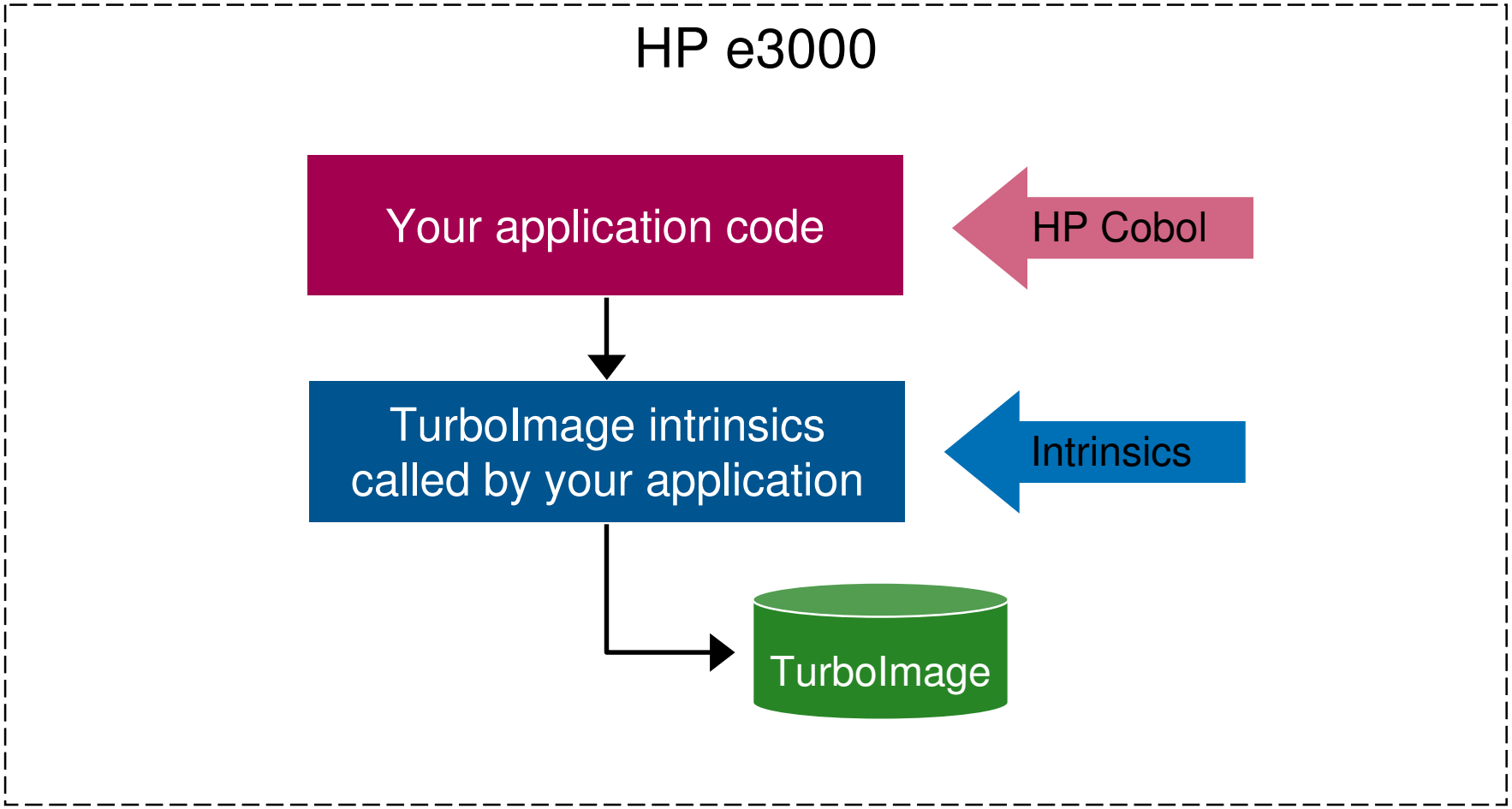


Image look-alike option

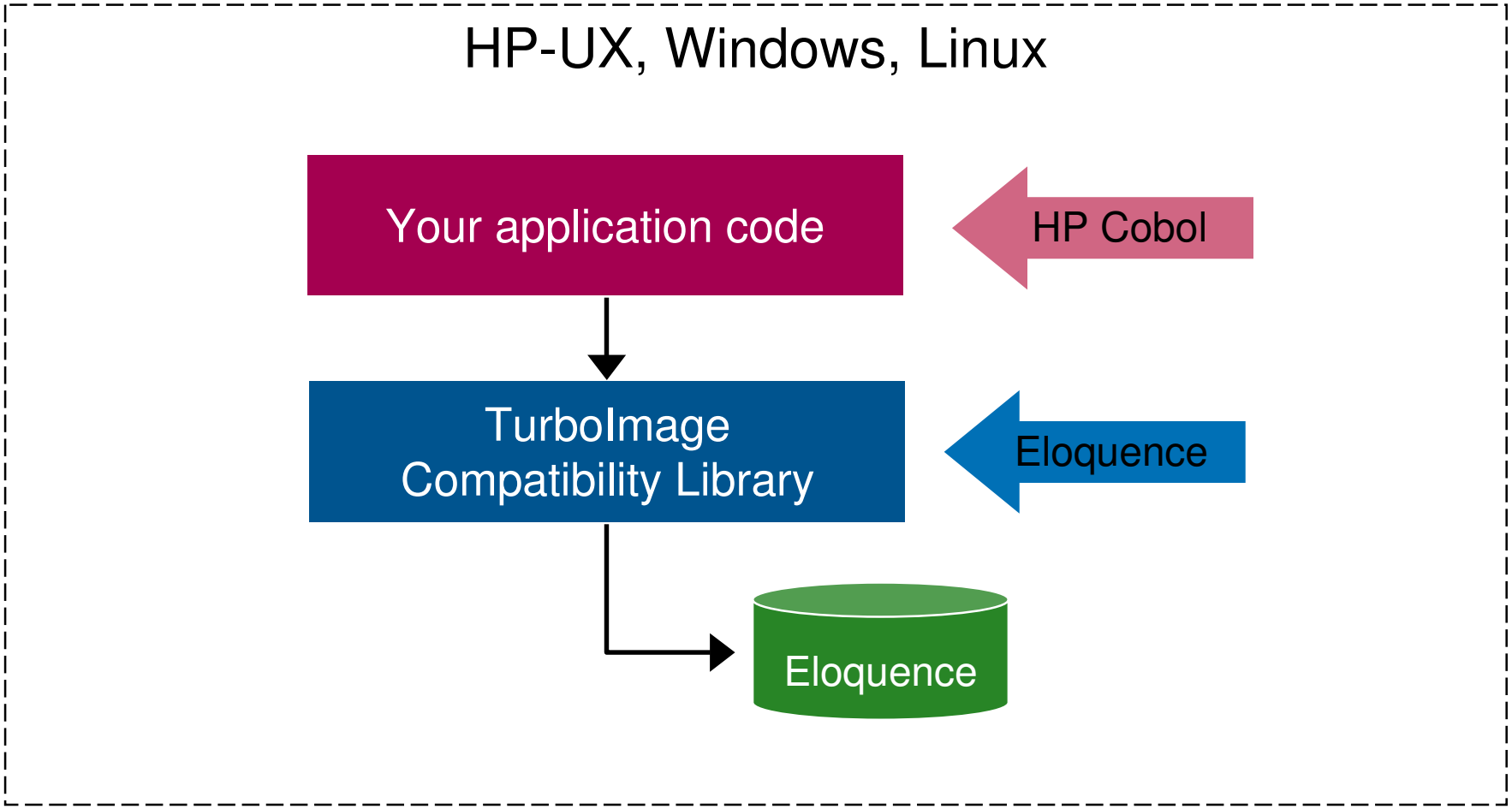
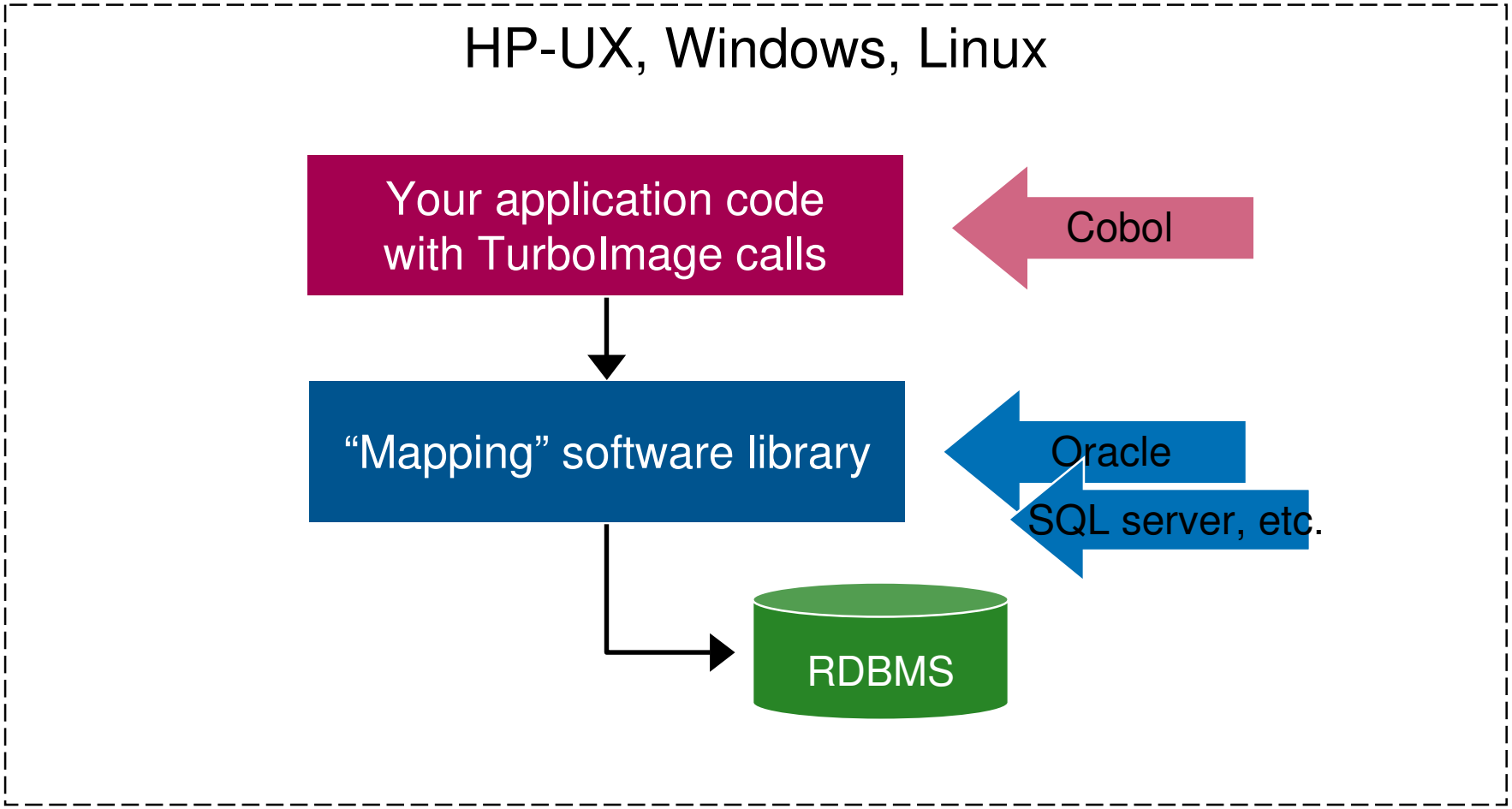
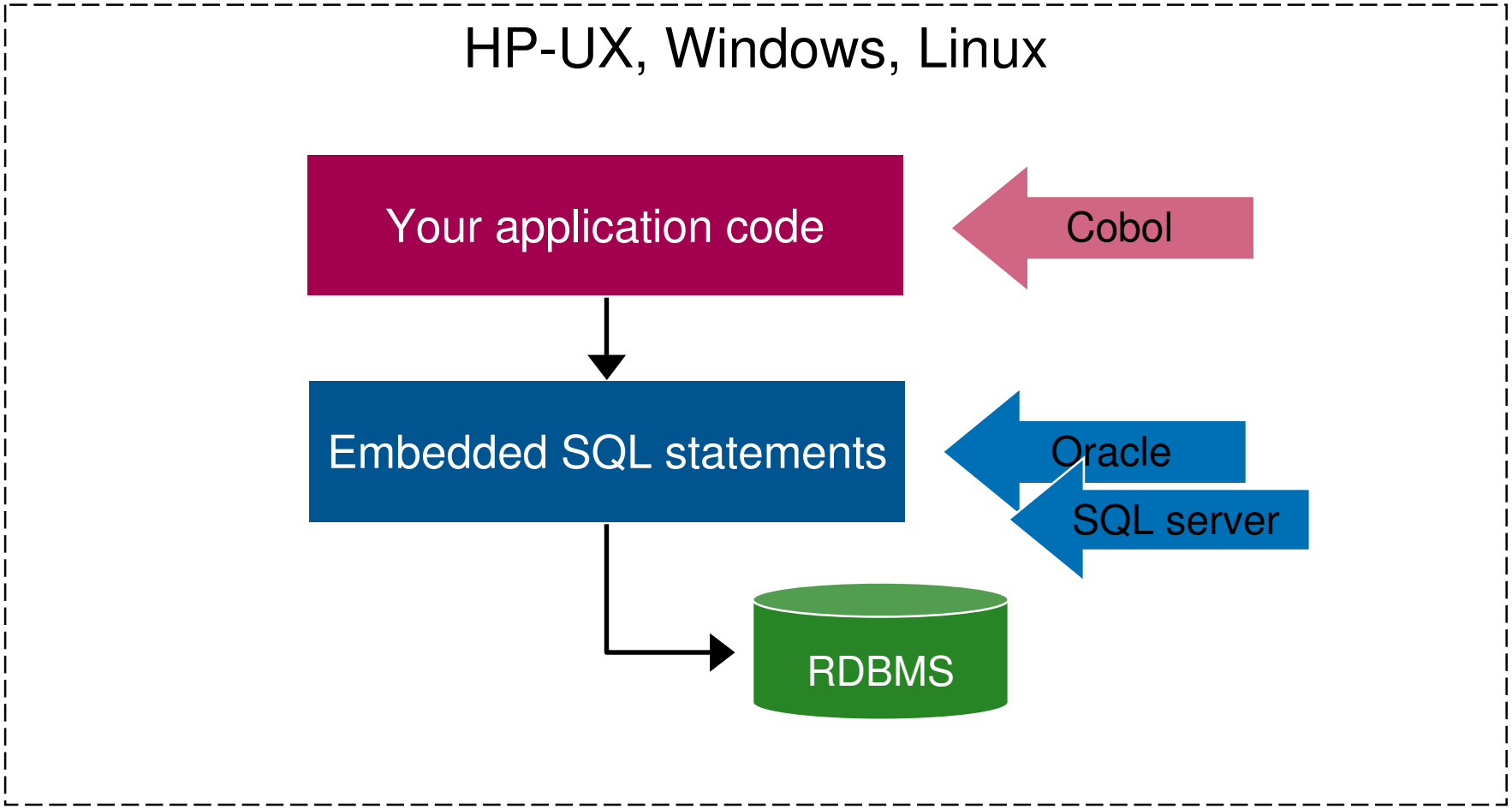


Image intrinsics mapping option



Redesign option



OS interface

Areas that need attention

- Calls to MPE system intrinsics and surround code (return-status check)
- Execution of OS Commands
- File equations
- MPE-specific networking
- UDC and command file utilization
- JCL code
- System variables and JCWs
- Interaction with spoolers
- Interaction with jobs
- Interaction with forms
- Interaction with hardware devices

HP COBOL specifics

Areas that need attention

- Cobol concepts
  - Copylibs
    - KSAM files need to be migrated
    - Concept is done differently with other compilers
  - $INCLUDE is done differently
  - CIERROR and intrinsics return status
  - Macro expansion does not exist with other compilers
  - SORT files
  - Sharing file IDs (FDs as Intrinsic parameters)

Summary: So what is required?

Solutions for:

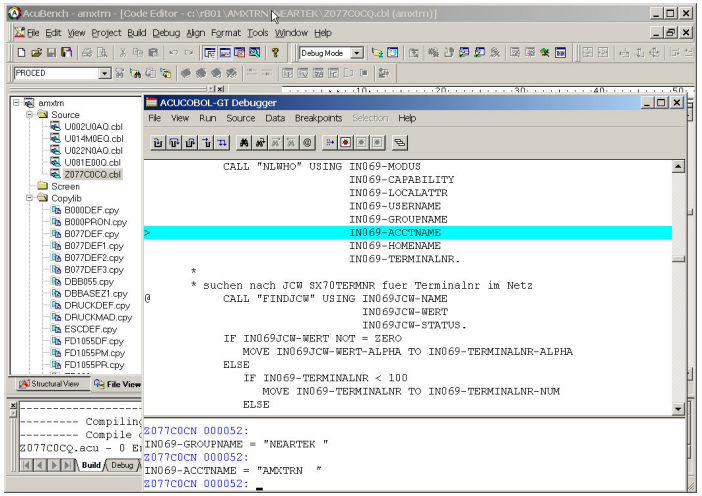
- HP COBOL code conversion for new compiler
- MPE-specific concepts
- Database and file migration
- Terminal interface (Direct I/O and VPLUS)
- Additional challenges
  - External utilities replacement
  - Job files and command files
  - Inter-application or inter-system communication
  - Use of ODBC, ADO or JDBC by PC apps

HP COBOL replacement compilers

COBOL compiler options

AcuCOBOL-GT

- AcuCOBOL-GT runtime (UNIX, Windows)
- AcuBench



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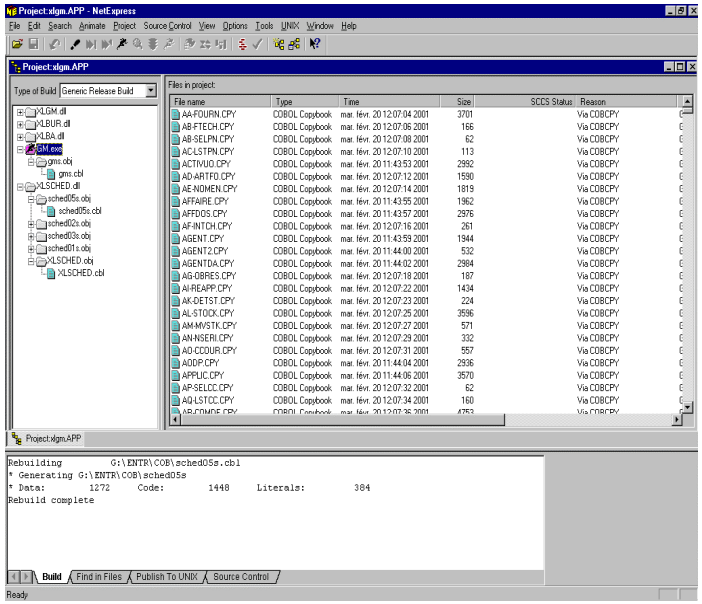
COBOL compiler options

MicroFocus

- NET EXPRESS (Windows)
- SERVER EXPRESS (UNIX)



COBOL compilers summary

- Microfocus' Server or Net Express
  - Largest market share
  - Expensive with many end-users
  - Compiles into native code
  - Offers screen equivalent for GUI forms
  - Requires a lot of code changes
  - Supported by COBOL Migration solutions
- AcuCorp's AcuCobol-GT
  - Very popular in the HP e3000 community
  - Cheaper run-time fees than Microfocus
  - Compiles into OS independent object code and native code
  - Runs on the HP 3000!
  - Offers GUI and SQL interfaces
  - Require very little syntax changes with MPE switch compatibility
  - Supported by COBOL Migration solutions

COBOL compilers summary (cont.)

- Fujitsu's NetCobol
  - Not as well known but proven
  - No run-time fees
  - Most .Net enabled
  - Compiles into native code for .Net
  - No popular migration tool support (sweet3000 not offered anymore)
- 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

Migration solutions

Possible migration solutions

- Manual conversion
- Speedware's AMXW
- Ordina-Denkart's ViaNova 3000
- Transoft
- Others

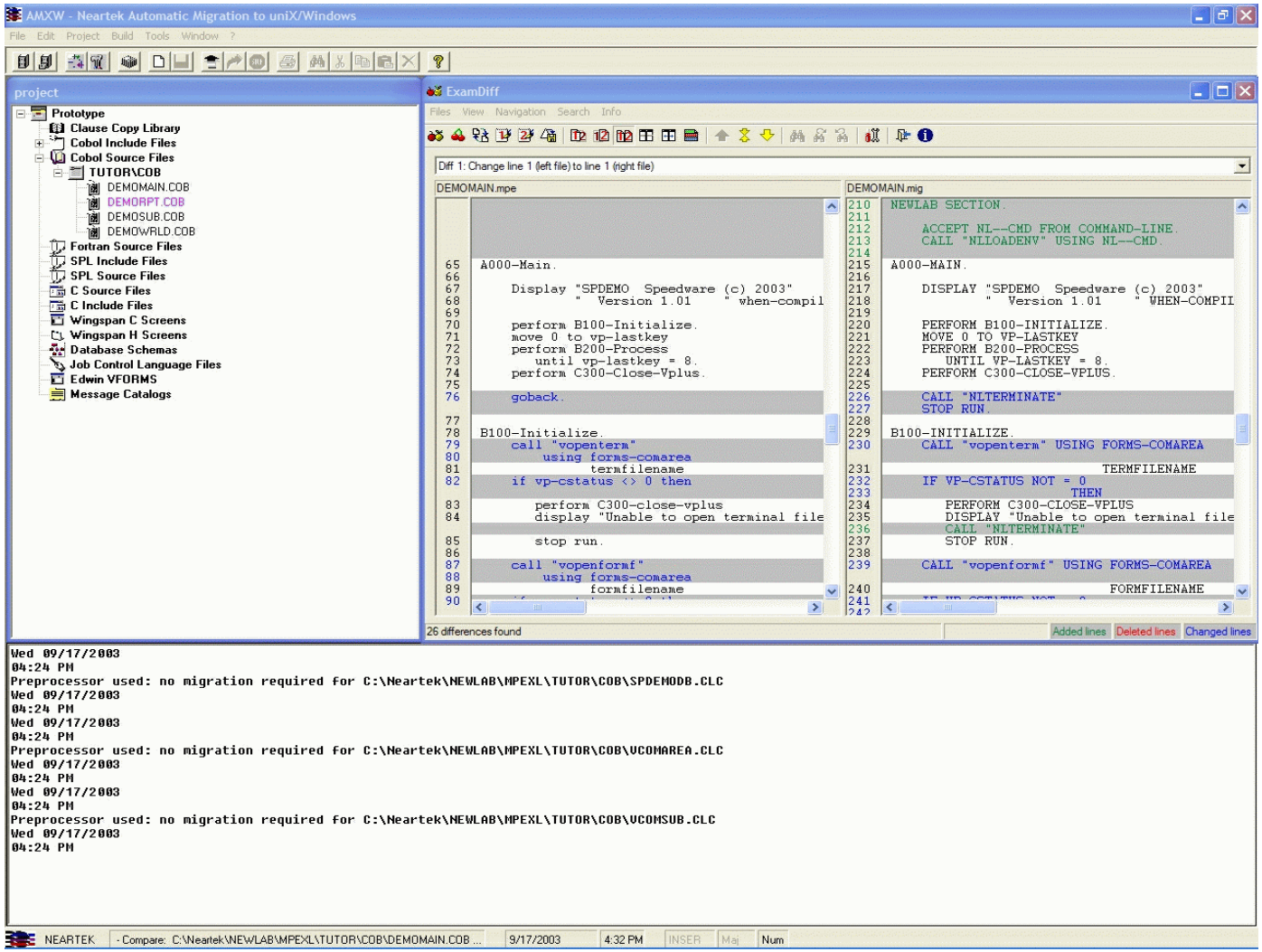
The AMXW solution (Speedware)

- Adapts the code
  - to a new compiler
  - to run in the new environment
- Maps MPE-specifics to platform-native equivalents
  - Supports MPE intrinsics
  - Supports database and file intrinsics
  - Supports MPE commands with an MPE shell
  - Uses mapping technology; not an emulator
- Migrates databases and files
- Handles user interface including VPLUS replacement solutions

Product overview

- Migrates applications written in many 3GLs to UNIX or Windows
  - HP COBOL to MicroFocus or AcuCOBOL-GT
  - Fortran 77 to Fortran 77
  - Pascal to Pascal
  - C to C
  - SPL to C
- Solves most challenges involved in a migration process
- Flexible purchasing model: Use the tool yourself or outsource the project or a combination of both
- Cost-effective solution which yields quick results and fast Return-On-Investment (ROI)
- Proven for 12 years; used by high-profile companies

AMXW client on Windows



The ViaNova 3000 solution (Ordina-Denkart)

- Code conversion
  - MicroFocus: Adapts code to work with MicroFocus compiler
    - Cross-compiler outsource-based service required
  - AcuCOBOL: Uses the AcuCOBOL-GT MPE switch and MPUX emulator
    - Cross-compiler outsource-based service not required
    - Not all HP COBOL code specifics handled; some manual work required
  - Supports MPE intrinsics
  - Supports file intrinsics
  - Supports Database intrinsics through ORDAT's ti2SQL
  - Supports MPE commands with their MPE emulator (MPUX)
- Migrates databases and files (mix of ViaNova and ORDAT)
- Replaces VPLUS using their edWin/3k product

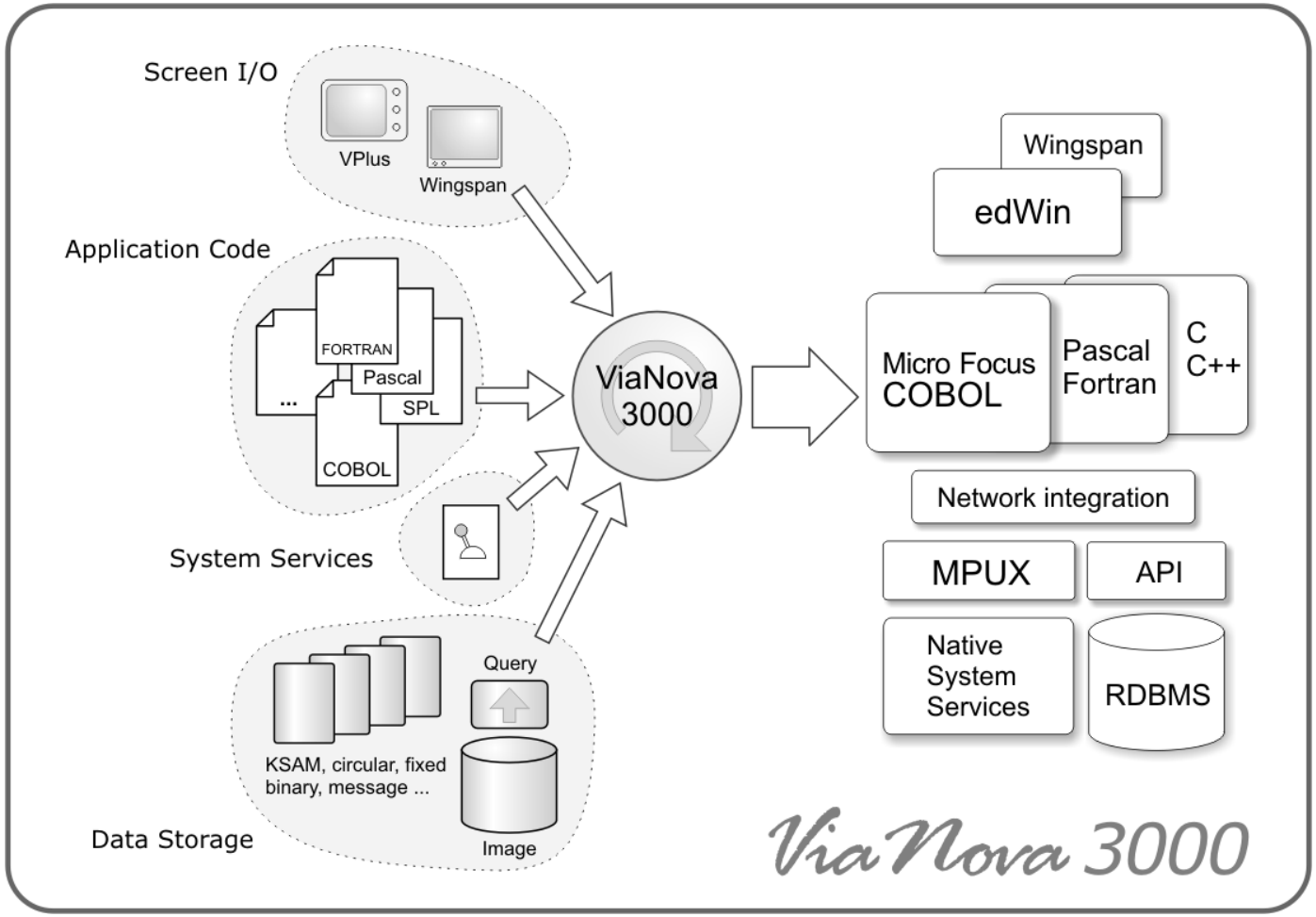
ViaNova 3000—Solution overview

- Migrates applications written in many 3GLs to Unix or Windows
  - HP COBOL to MicroFocus (cross-compiler) or AcuCOBOL-GT
  - Fortran 77 to Fortran 77
  - Fortran to C
  - Pascal to C
  - C to C
  - SPL to C
- Solves most challenges involved in a migration process

ViaNova 3000—Solution overview

- Outsource-based model: send the code, receive it migrated (~95%); in certain cases companies have used the tool with training
  - Sales cycle steps
    - We send the customer's code to them
    - They run it through an estimator
    - They provide a quote for us
    - We mark up the price
    - If the customer agrees and signs off, Denkart performs the migration
    - Completed work, along with error reports for what didn't convert are sent back to the customer
      - Customer must complete the work himself, OR
      - Speedware outsources completion of work to Denkart (or others)
- Proven solution used by high-profile companies

ViaNova 3000—Solution overview



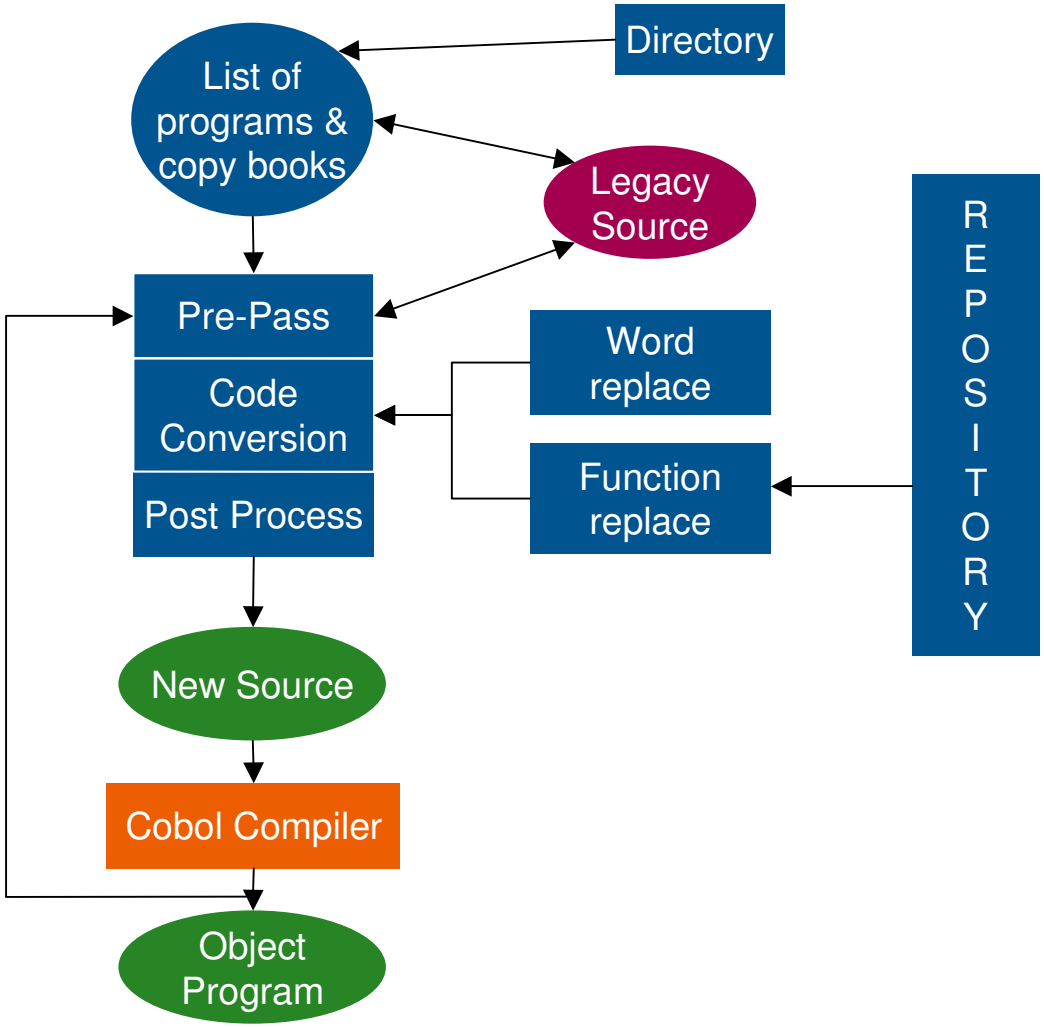
The Transoft solution

- Code conversion
  - MicroFocus: Adapts code to work with MicroFocus compiler
    - Cross-compiler outsource-based service required
  - AcuCOBOL: Uses the AcuCOBOL-GT MPE switch and converts the MPE-specific code to a platform native equivalent
- Uses their technology and services: Transoft intelligent adapters
- Converts MPE-specifics to platform-native equivalents
  - Supports MPE intrinsics
  - Supports file intrinsics
  - Supports Database intrinsics or can convert to SQL
  - Converts MPE commands to platform-native equivalents
- Migrates databases and files
- Replaces VPLUS using their GUI intelligent adapters

Transoft—Solution overview

- 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—Solution overview



Legacy Liberator is 'trained' to convert the legacy source to Open Systems source based on the choices you have made regarding the Target Platform.

Other 3GLs

Fortran

- There are only 2 solutions for Fortran 77 to Fortran 77
  - ViaNova 3000 (Ordina-Denkart)
  - AMXW (Speedware)
- The solution can be determined based on the customers needs
  - Customer wants to do it themselves
    - Best Fit: AMXW 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 by the customer (no tools)
      - MPUX is used for the MPE specifics
  - Customer wants it outsourced
    - ViaNova 3000 (Ordina-Denkart) can provide a 100% outsourced solution
    - AMXW with a platinum partner's assistance can provide a 100% solution.
- Ordina-Denkart also has a Fortran to C cross-compiler

Pascal

- Pascal is available on the HP-UX platform, however:
  - Will not be supported on IA-64, except in compatibility mode
  - HP's Pascal support on HP-UX is limited
- HP Pascal (MPE/iX) to HP Pascal (HP-UX) Migration is relatively straightforward since the code needs little/no changes
  - Companies still need to convert the MPE-specifics themselves or use AMXW/MPUX.
- Recommended option is conversion to C:
  - Pascal to C: ViaNova 3000 (Ordina-Denkart)
    - Combine with MPUX to get MPE emulation for a quick and clean solution

RPG

- There are 2 solutions for RPG
  - Richter Software has an RPG to HP COBOL migration solution
    - Proven with many customers
  - There are 2 RPG compilers available for HP-UX, however:
    - There are no migration tools
    - Migration will be very difficult
- MPE RPG syntax is significantly bound to MPE therefore it is not very portable
  - A migration tool is a must. Therefore, only Richter is a viable option today.

SPL

- MPE SPL to HP-UX SPL
  - Allegro was working on a SPLash compiler for HP-UX/Windows/Linux (status?).
    - Companies still need to convert the MPE-specifics themselves or use AMXW/MPUX.
- SPL to C
  - There are 2 known and proven conversion solutions for SPL to C
    - ViaNova 3000 (outsourced)—Ordina-Denkart
    - AMXW (tool)—Speedware (tool)
    - Both offer MPE emulation/mapping

C

- MPE C to HP-UX/Windows C
  - MPUX (tool)—Ordina-Denkart
  - AMXW (tool)—Speedware

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
- An alternative on the PC could be to go to Visual Basic, however, there are no migration tools

Conclusion

- How to choose a solution vendor
- Final advice
- Q&A

How to choose a solution vendor

Factors that influence vendor choice

- Time requirements
  - Some solutions gets you started faster than others
- Resource availability
  - Do you prefer being directly involved with the migration?
- Budget restrictions
  - Some solutions cost more than others
- End result
  - Explicit native code solutions take more time and cost more
  - Faster solutions use run-time emulators or mappers
- Preference for migration methodology technology
- Willingness to pay ongoing support for emulator/mapper runtime
- Strategic IT Direction

How to choose a solution vendor

Solution is based on what best fits the customers needs

- Customer wants to do it themselves
  - Best Fit: AMXW 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 by the customer (no tools)
- Customer wants it outsourced
  - ViaNova 3000 (Ordina-Denkart) can provide a 100% outsourced solution
  - AMXW with a platinum partner's assistance can provide a 100% solution.
- 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.
  - Alternative: ViaNova Flex service from Ordina-Denkart

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” or “Migration advisors and engineers”
- 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.

Q&A

Thank you!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