Using OS Isolation Layers for Two-Step Migration

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Agenda

- Background

- Migration Approaches

- Two Step Application Migration

- Benefits

- Q&A

Scenario

Moving an application from MPE/iX to Unix poses many challenges:

- Complexity of changes

- Time taken to switch

- Resources & schedule

- User & support staff training

- Performance

- Maintenance

Typical Application Profile

UI   Business Logic   DB

VPLUS   *Application code and INTRINSICS*   *IMAGE or ALLBASE*
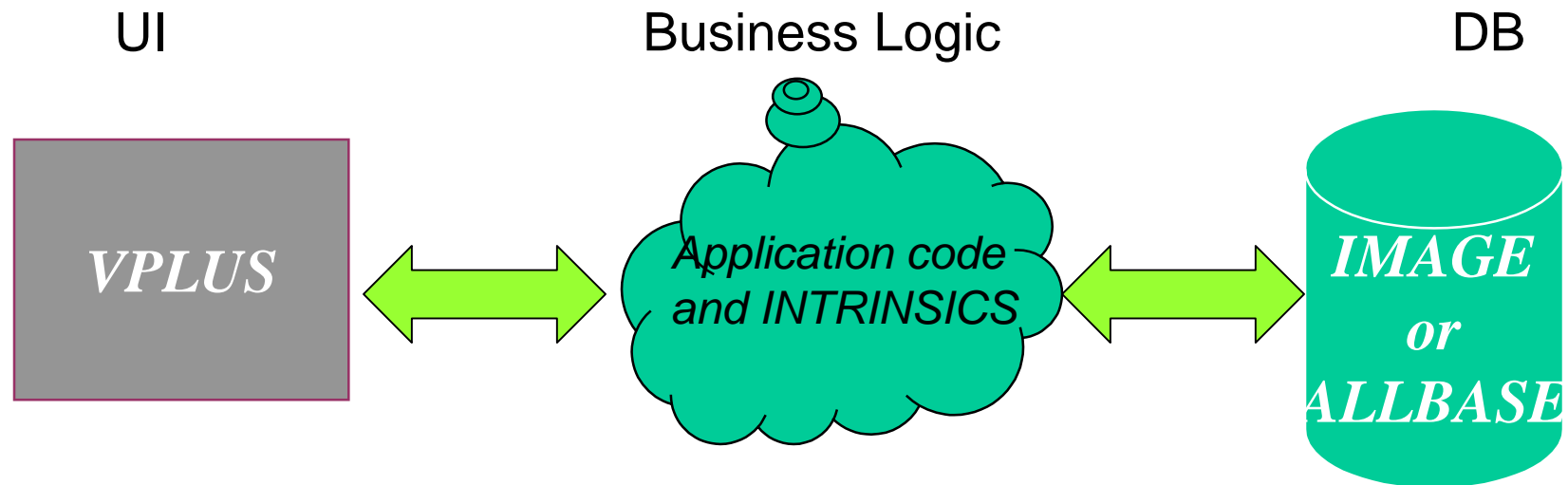
- Written in COBOL using MPE/iX Intrinsics
- OLTP / job oriented
- Uses CI scripts and UDCs
- ISV tools/utilities/4GLs

Different Migration approaches

- Business Logic Migration

- Application re-engineering

- Application Migration using middle layers

- First by middle layer, followed by re-engineering

Business Logic Migration

Re-development of application on target platform

Pros

- Scalable
- Adaptable.
- Make use of new technologies.
- Sustainable

Cons

- Huge investments in resources
- May cause end-user frustration

Migration by re-engineering

Porting of application to target platform

Pros
- Application architecture is preserved
- Features native to target platform are utilized
- Easy to maintain & enhance

Cons
- **Application undergoes drastic changes**
- Requires domain expertise in MPE and target platforms
- Needs simultaneous focus on functionality and performance
- Extensive code changes based on application logic
- Difficult to troubleshoot
- User re-training may be required
- Large costs & schedules

Migration by middle layers

Migration by tools that emulate MPE features

Pros
- **Minimum source code changes**
- **Full functionality at low cost**
- **Easy interfacing with the target environment**
- **Quick migration**
- **Off-the-shelf tools available**
- **Look & Feel retained**

Cons
- **Extra layer between Application and native OS**
- **Can cause performance degradation**
- **Under-utilization of RDBMS features**
- **No perfect replacement for all intrinsics**
- **Hard to maintain/enhance**
- **May be expensive to operate**

Migration in steps

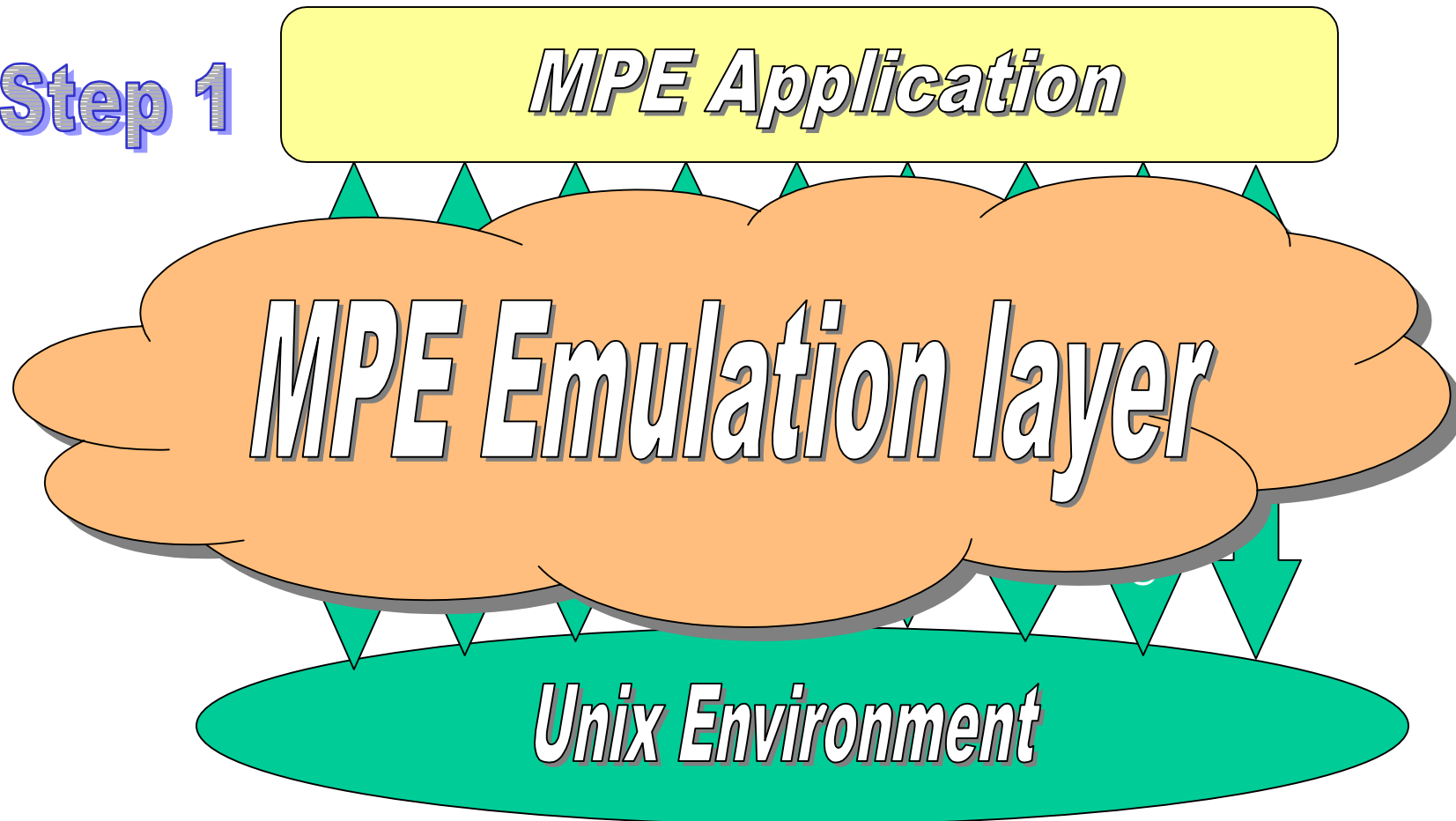Breaks down migration task into 2 evolutionary stages

Step 1

- Installation of MPE emulation environment /libraries

- Porting of data files

- Testing for **functionality**

Step 2

- Adapting to native OS in managed pace

- Application re-engineering during adaptation
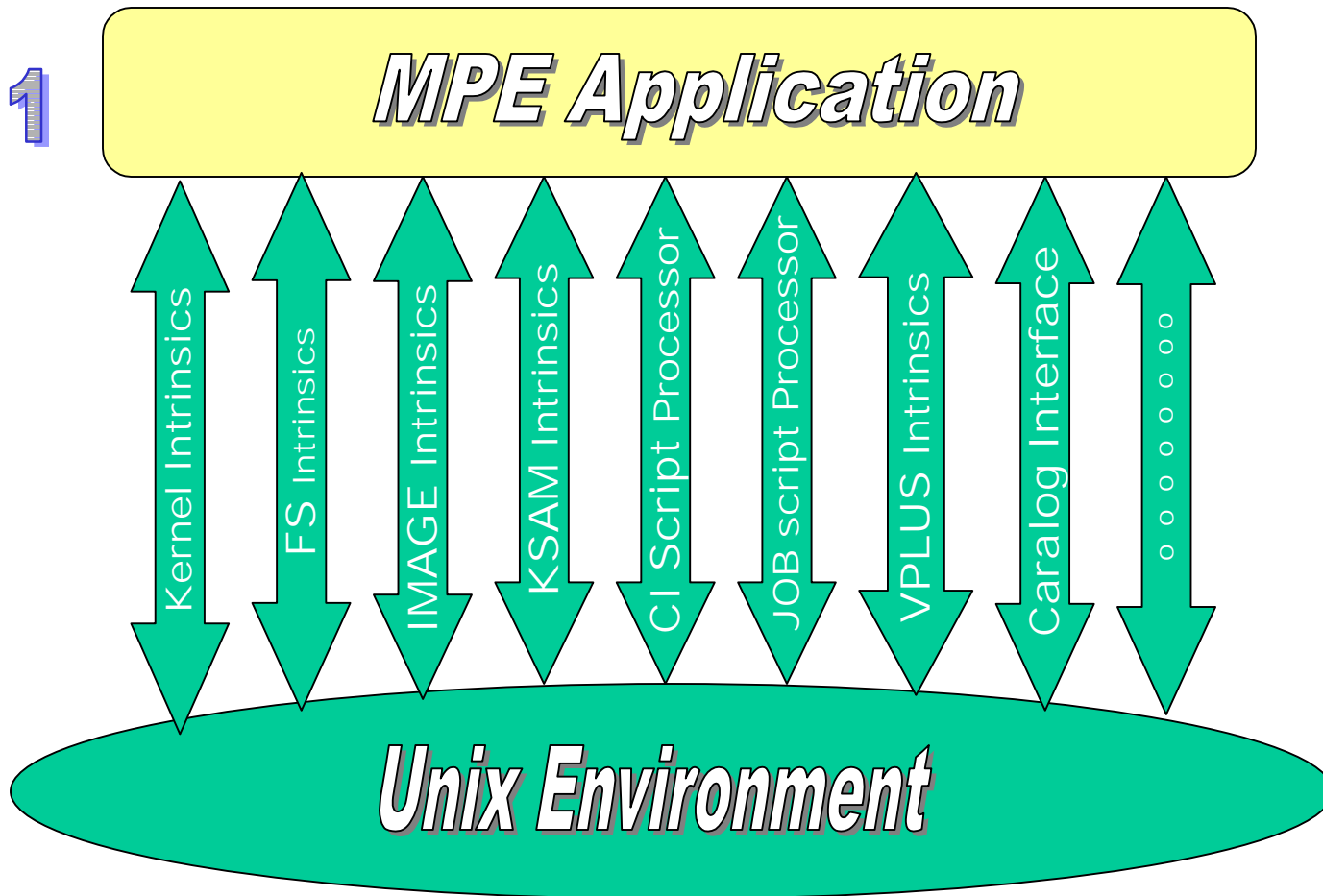
- Testing for **performance**
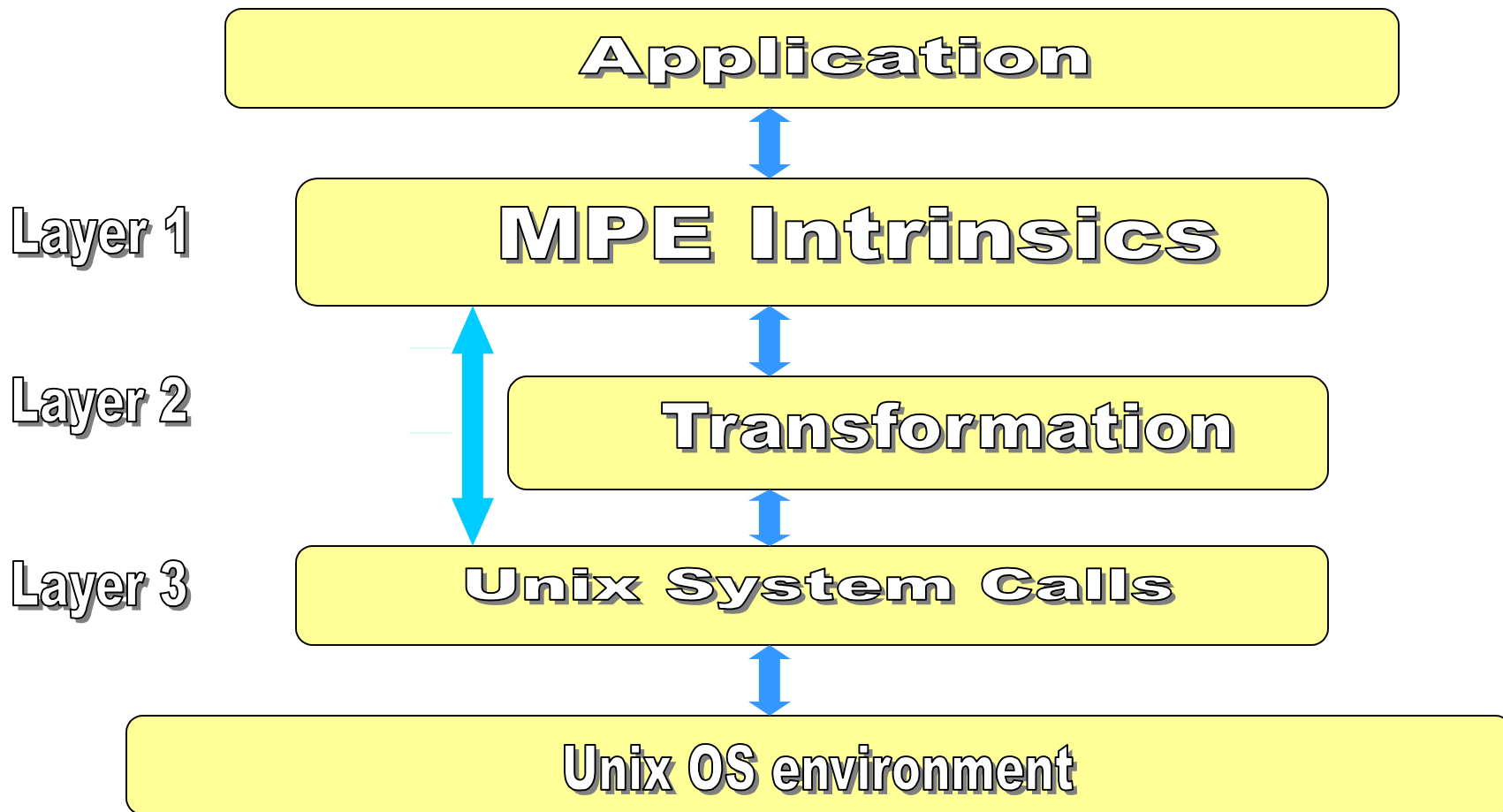
Migration by middle layer

Step 1

MPE Application

MPE Emulation layer

Unix Environment

Inside the emulation layer

Emulation Layers

Application

Layer 1 — MPE Intrinsics

Layer 2 — Transformation

Layer 3 — Unix System Calls

Unix OS environment

Migrating MPE Files

- Features unique to MPE

  - Types: Message files, circular files, relative I/O
  - Domains: NEW, TEMP, PERM
  - User labels
  - CAPS: Multi-level access control and lock-words
  - KSAM Files

- Emulation layer need to support many of these features

MPE View of Unix Files

- Store MPE file attributes in a separate Label table

- Allow Global Data Pointer Sharing

- File Type Managers

- MPE file system security / lock-words

- CI to give MPE view of files

Migrating Data

- ASCII and Binary Data files
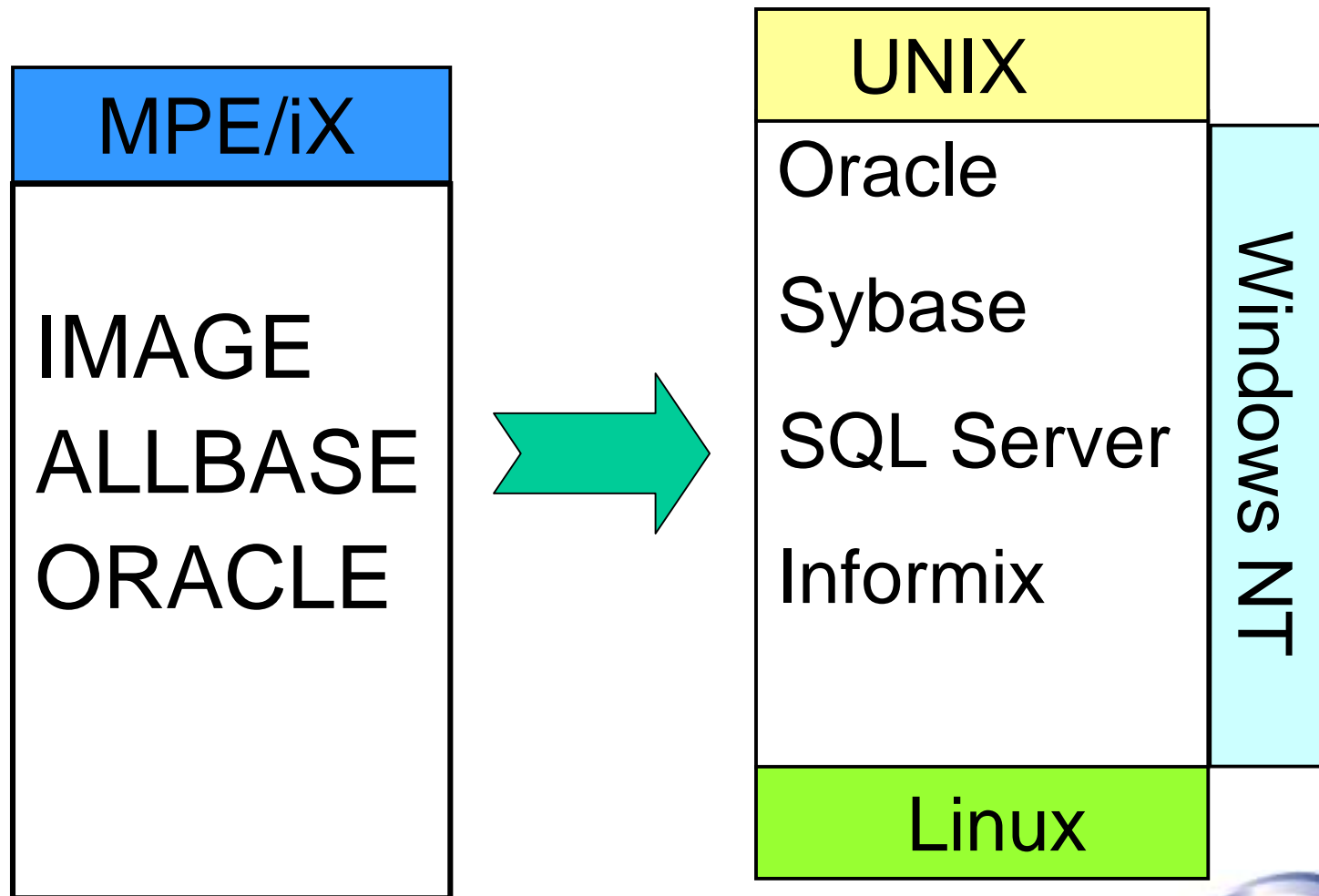
  Variable record length files need to be converted

- Database Migration

  Data type compatibility

  Indexes, Scans

  UNLOAD/LOAD of data

Database Migration options

MPE/iX

IMAGE
ALLBASE
ORACLE

→

UNIX

Oracle

Sybase

SQL Server

Informix

Windows NT

Linux

HP to MF Cobol Code Translation

Directly compatible

- Divisions
- Sections
- Paragraph
- ALL symbolic characters
- All Special Character words
- PICTURE Character Strings
- Comment entries
- REDEFINES
- SYNC Clause
- USAGE Clause

With code Tweaking

- Literals
- Parameter passing to Intrinsics
- Condition code
- Random access files
- Relative files
- Index files
- FD and SD Clauses
- EXTERNAL Clause

Kernel and FS Intrinsics

- Emulate MPE intrinsics

- Support MPE file types & modes

- Support for MPE file attributes

- Wrapper routines to follow COBOL calling conventions

- Return CCODE values in MPE style

Kernel Intrinsics

FS Intrinsics

DBMS Support
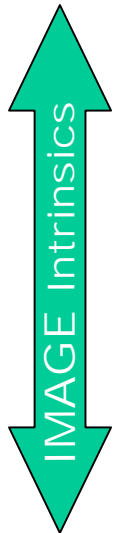
IMAGE Intrinsics

- Wrapper routines for Image intrinsics to Oracle calls

- Form dynamic SQL statements from parameters

- Return data & status codes exactly as Image would

- Implement unsupported features of Image on Oracle

KSAM support

KSAM Intrinsics

- Provide KSAM Intrinsics wrappers

- Maintain user labels in emulated label table

- Support Record access in chronological order

- Enable Native language usage

MPE Shell on Unix

- Emulate MPE Session and JOB environment

- Support all commonly used CI commands

- Support UDCs and File equations

- Give an MPE view of the Unix files to users

- Allow MPE security features

CI Script Processor

JOB script Processor

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Message Catalogs

Caralog Interface

- Port MPE catalog files as ASCII

- Convert to Unix catalog files

- Access through Unix catalog interface

- Make use of Unix language localization
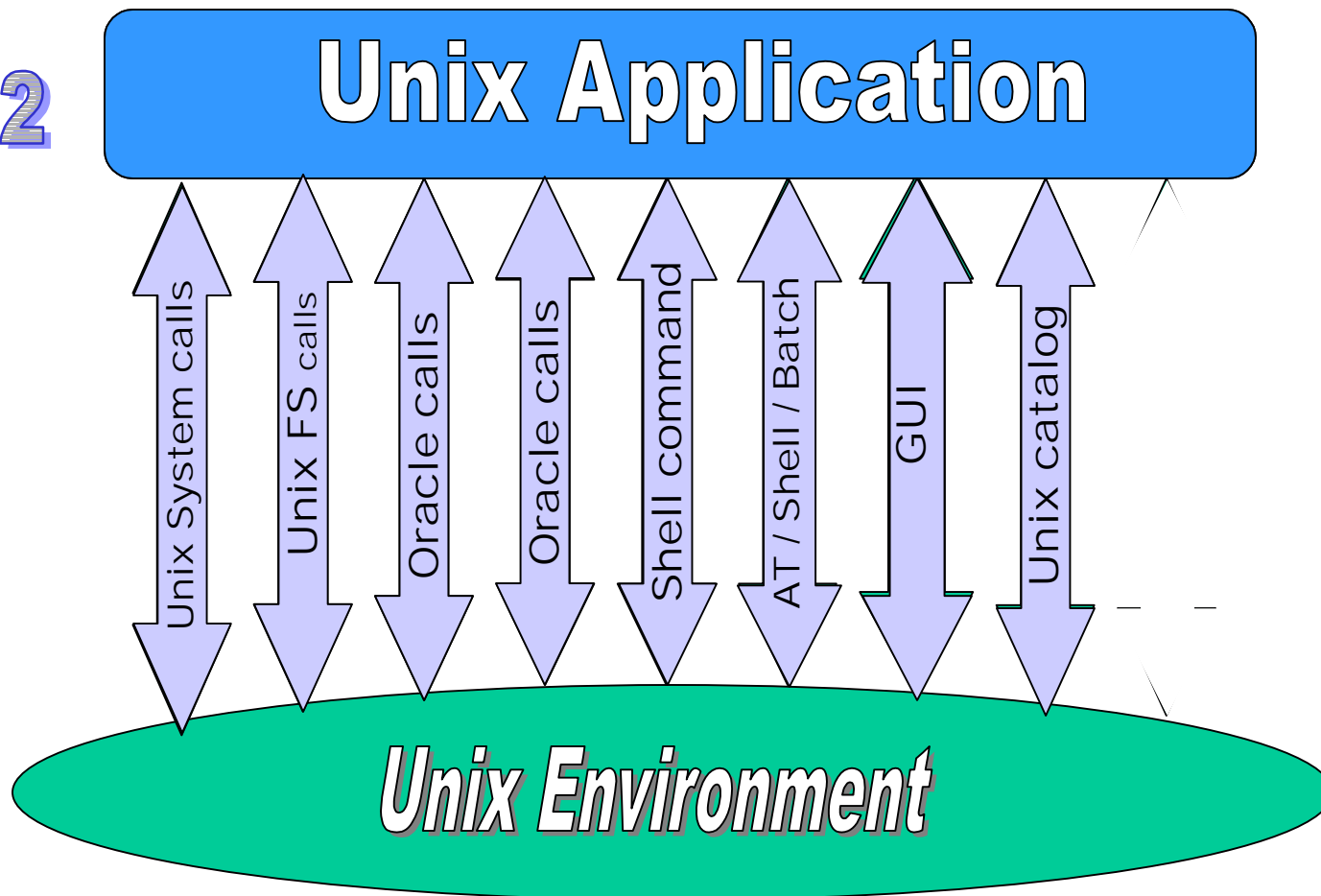
UI Migration
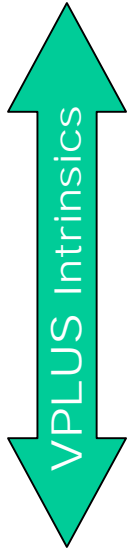
Emulate VPLUS

- Allow usage of VPLUS forms files as such on UNIX

- Allow editing of forms files in Unix

- Support all VPLUS intrinsics

- GUI based on MOTIF, Block mode or Curses

PC Based GUIs

- VPLUS to VB Conversion tools

VPLUS Intrinsics

Middle Layer Elimination

Step 2

Unix Application

Unix System calls

Unix FS calls

Oracle calls

Oracle calls

Shell command

AT / Shell / Batch

GUI

Unix catalog
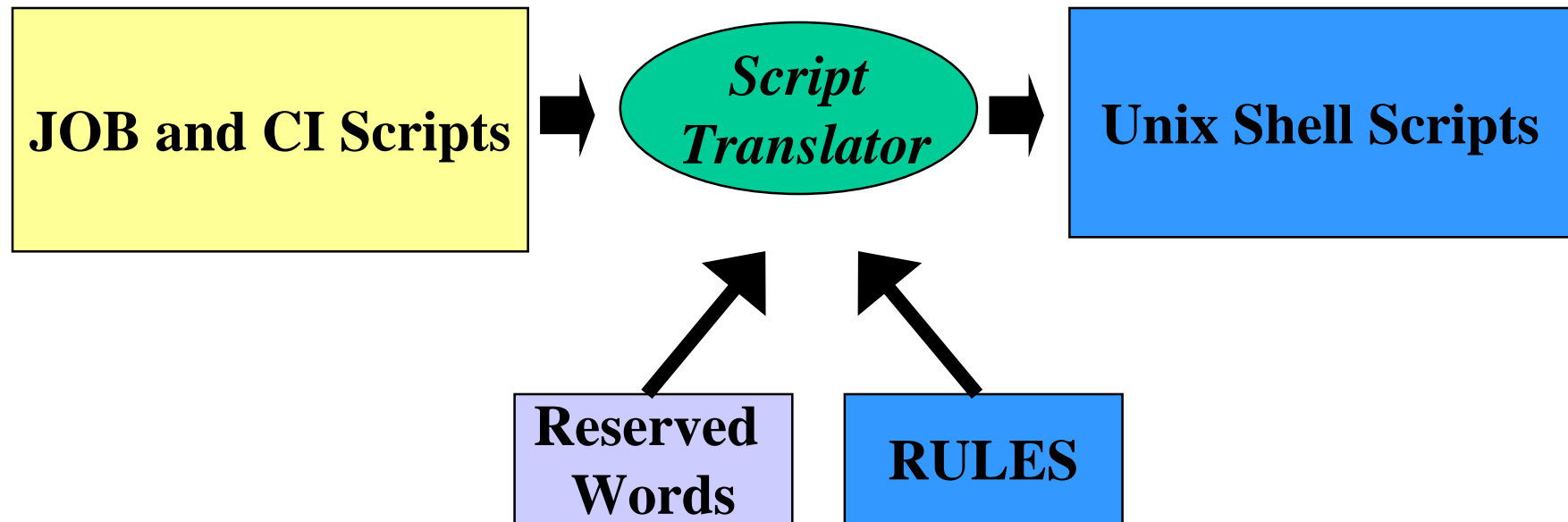
Unix Environment

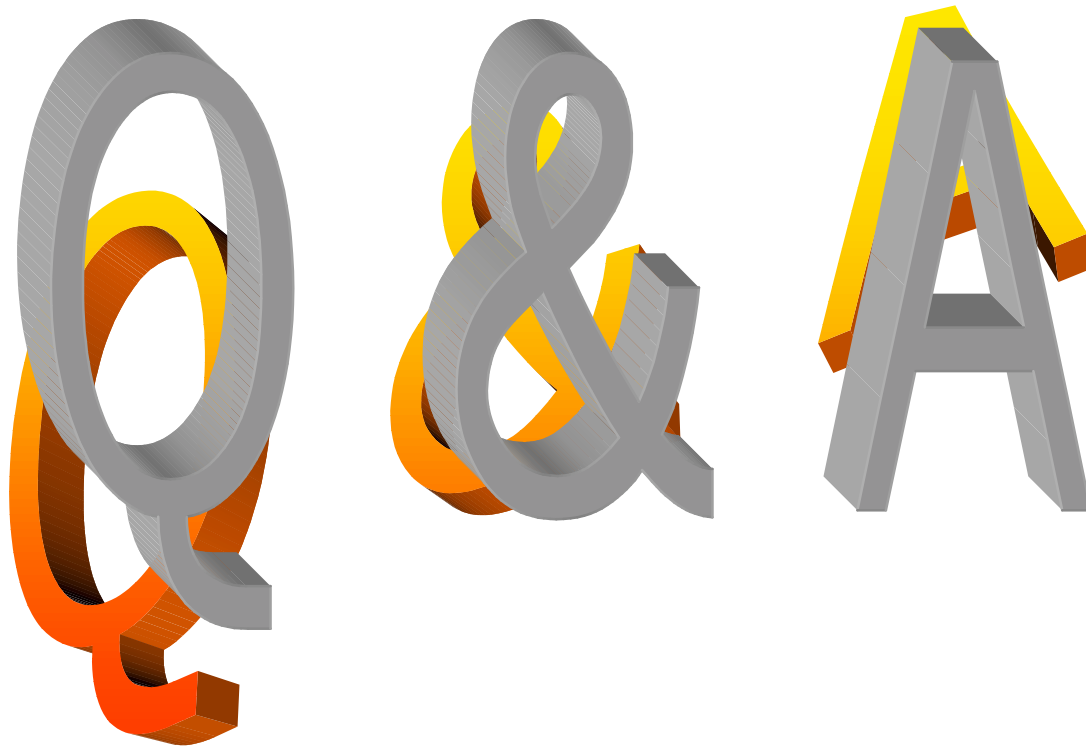HP WORLD 2002
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Major tasks in step-II

- Dependency elimination on emulation layer

- MPE intrinsics to Unix system calls

- JOB / CI script translation to Unix shell commands

- Database normalization and application revamping

- IMAGE intrinsics to Oracle calls

- KSAM intrinsics to Oracle calls

Porting JOB and CI scripts

Benefits

- Combining the best of two approaches
- Quick migration to target platform
- Minimum User Training
- Dependency on Emulation layer is eliminated in stages
- Co-existence of emulation layer and adapted modules
- Option of staggered IT spending
- Gradual ramp up for support staff on target platform
- Re-engineering can be done with minimum resources
- Cost effective

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