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CONVERSION AND
REENGINEERING OF
ENTERPRISE
APPLICATIONS

Using the Mass
Conversion
Approach to Migrate
from VSE to z/OS

Typical Justification

1. Performance ... Simplify and Upgrade HW/SW Configuration

- Consolidate several smaller CPUs and / or VSE machines
- Eliminate dual VSE + z/OS production environments
- Upgrade to larger processing capacity
- Generate scale cost savings

2. Reorganization ... Adapt to New Host Configuration

- Business growth, acquisition or merger
- Data center consolidation
- Data processing reorganization
- Operations outsourcing, facilities management

Typical Justification

3. Limitations ... Avoid Growing VSE Obsolescence

- Can't find or keep skilled VSE staff
- Migrate away from perceived VSE instability (compared to z/OS)
- Vendors freezing VSE product developments/improvements
- Vendors dropping support of their VSE products

4. Modernization ... Position for Future

- Migrate to superior stability, strength, performance, and availability
- Production management and automated operations
- Strategic z/OS products: DB2, DFSMS, WebSphere, ...
- Strategic new applications: industry-specific, e-business, ...
- Preferred platform for introduction of new technology

Migration Sub-Projects

1. Technical Support

- HW configuration upgrade: CPU, DASD, TAPE, PRINTERS
- z/OS software selection and installation: system & products
- From startup-system to production-ready: sizing, performance, SMS
- CICS subsystems and network
- Security: RACF (source code, data, databases, CICS)
- DBMS: data dictionary, DB definition and migration, etc

2. Applications

- Convert in-house developed VSE code, JCL and data to z/OS
- Replace VSE purchased applications by z/OS version

Migration Sub-Projects

3. Operations and Production Control

- Job scheduling, back-out, restart and rerun procedures
- Report management
- Automated console
- Backups, disaster recovery
- Help Desk
- Source management and change control

4. z/OS Retraining

- Systems programmers
- Applications and Operations support staff

Needs and Requirements

1. Operational Needs

- End-user transparency
- Minimal disruption of operations and applications support
- No overlap of dual VSE + z/OS operations
- Standardized and automated target z/OS production

2. Cost/Benefit Requirements

- Predictable timeframe and cost
- Reduced staff participation → focused on learning z/OS
- Minimal delay/postponement of development and maintenance
- Turn costs into investment
- Low risk

Migration Challenges

1. Application Inventory

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- Determination, collection, and supply
- Resolution of duplicate, missing, and unreferenced

2. Program Conversion

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- Light syntax modification such as device independence
- [COBOL code upgrade]
- Conversion of VSE-only features such as POWER segmentation
- Manual conversion: job submitters, complex Assembler, etc
- [Language conversion: RPG to COBOL, etc]
- Feed JCL conversion with file OPEN information

Migration Challenges

3. JCL Conversion

- Retrieve application flowcharts
- Identify and classify data flows
- Define new z/OS standards
- Generate standardized z/OS JCL
- Utility step conversion

4. File Migration

- File identification and classification (by-product of JCL conversion)
- z/OS file cataloging
- [Device migration: tape to disk]
- Tape file migration: archive vs. active
- Database migration

Migration Challenges

5. Project Management

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- Planning, coordination and follow-up - resource availability

6. Production Management

- Job scheduler
- Report manager
- Tape manager
- Source management and change control
- [Help desk, automated console, ...]

Mass Conversion Methodology

Mass Conversion

Single Switchover Weekend

- No overlap of VSE and z/OS
- Minimal disruption of operations
- Shorter project timeframe

Automated Conversion

Enhance process to enhance deliverables

- Reduced labor and cost
- Improved quality of deliverables

Repetitive Conversion

Repeat trial conversion from refreshed inventory

- Minimal maintenance freeze or duplication
- Minimal disruption of applications support

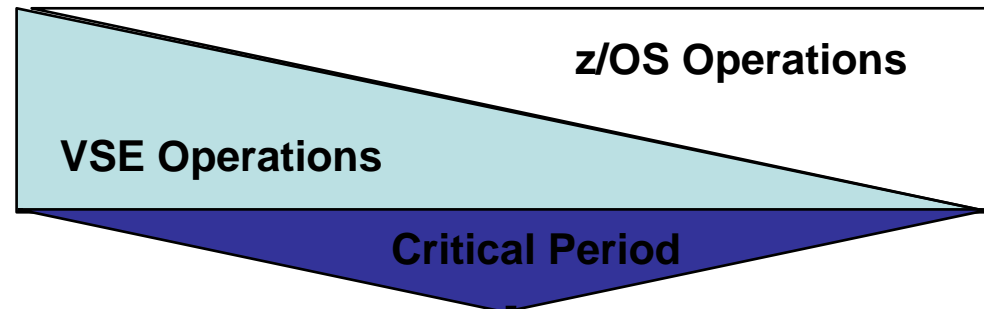
Phased Conversion

Proven project plan

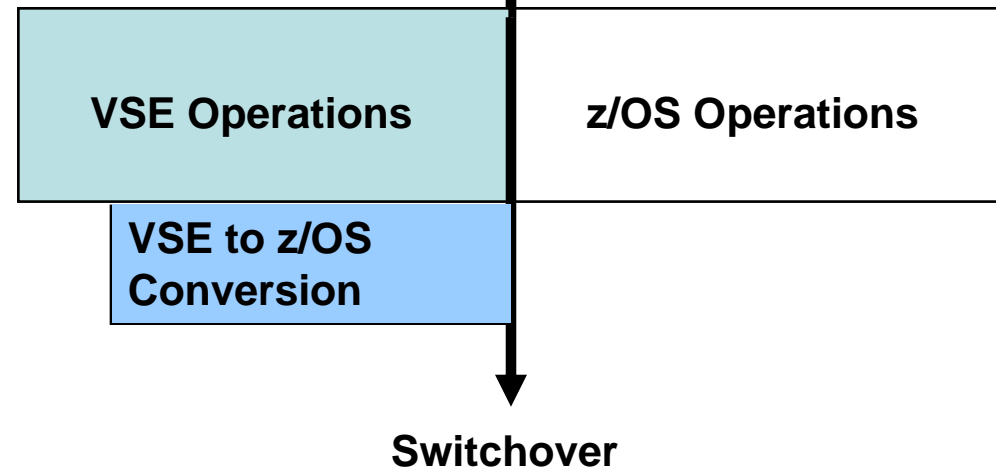
- Improved project management
- Greater visibility and control
- On-time completion

Progressive versus Mass Conversion

Progressive Conversion

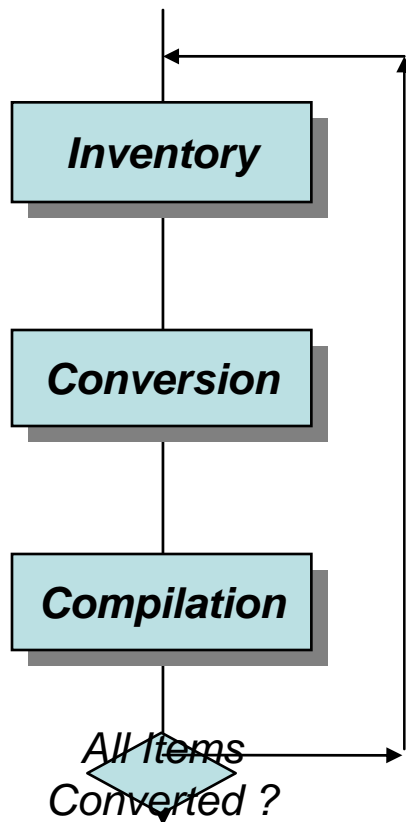


Mass Conversion

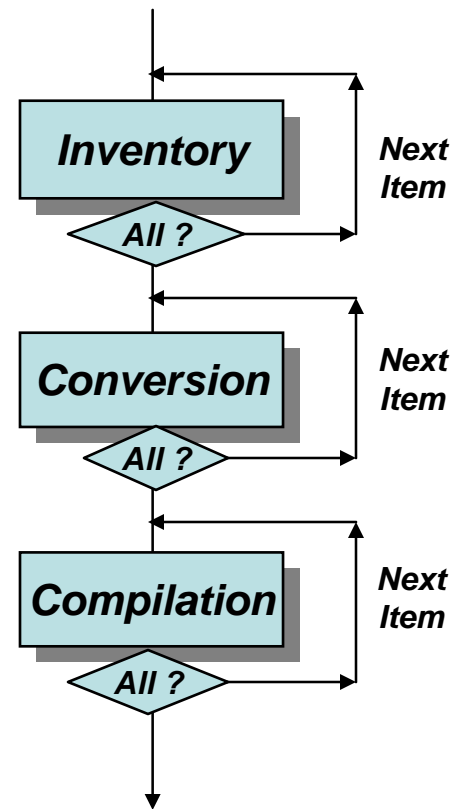


Mass Conversion

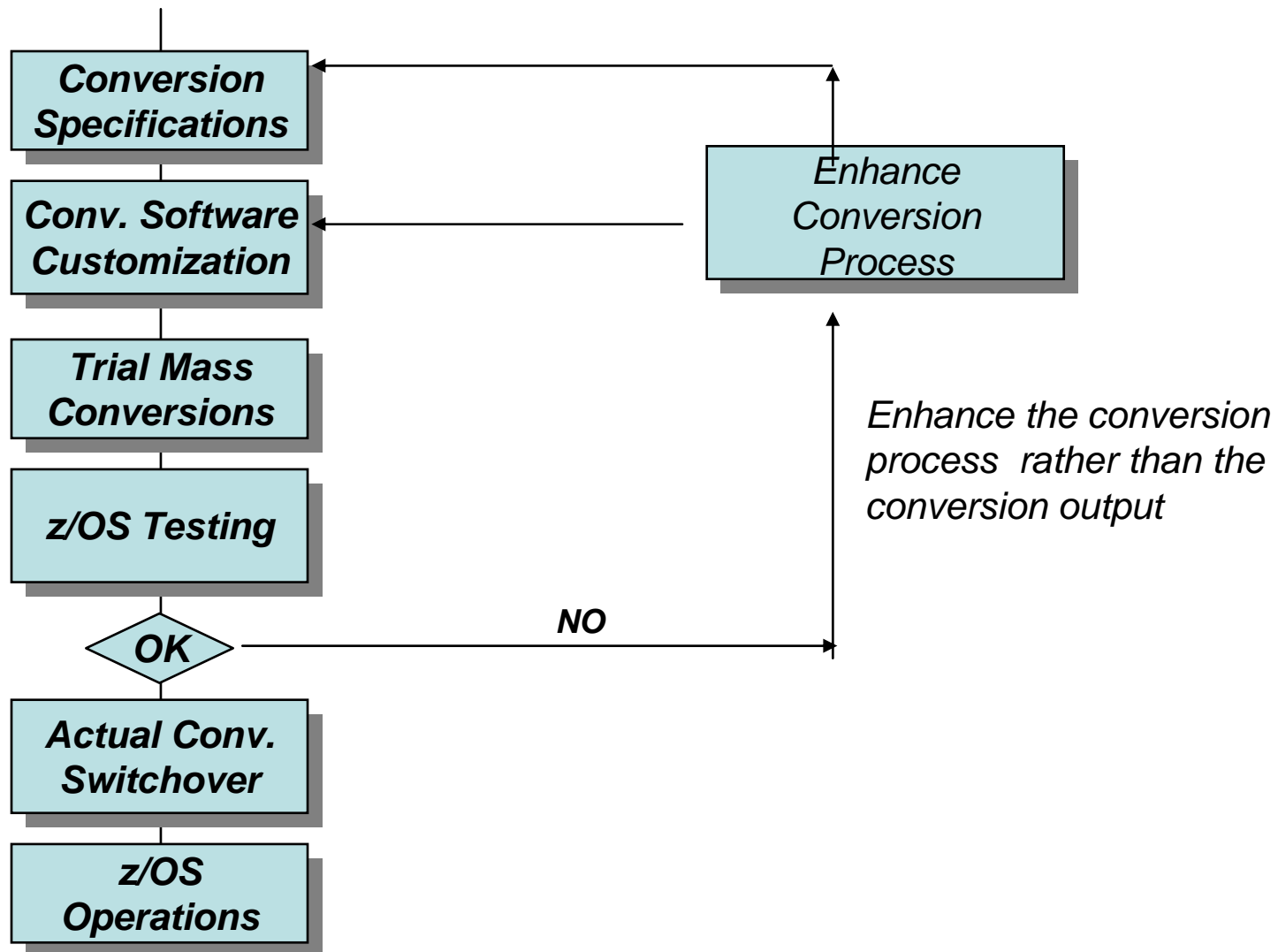
Item by Item Conversion



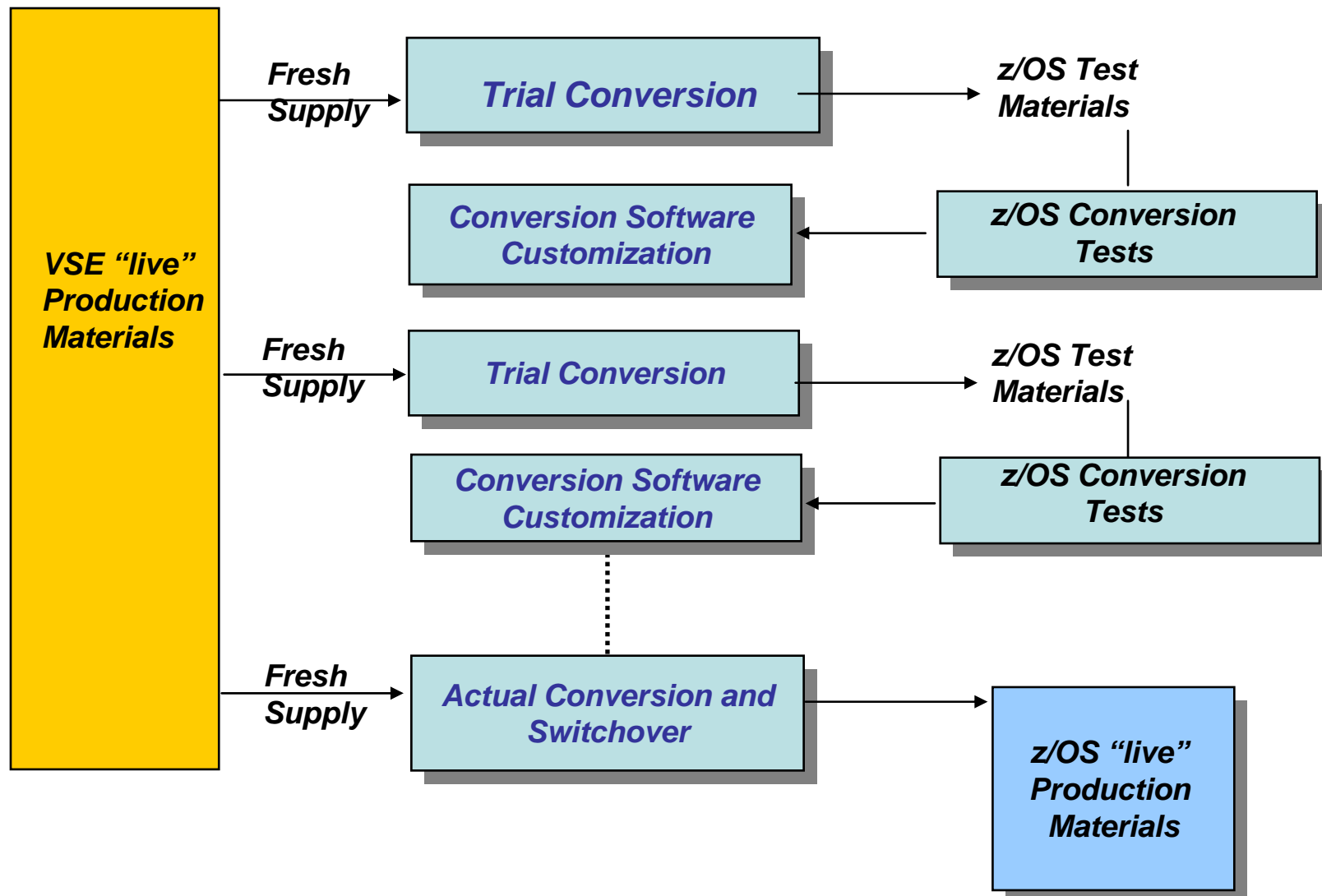
Mass Conversion



Automated Conversion



Repetitive Conversion



Overlapping Project Phases

1. Preparation Phase

- Application Inventory: Eliminate Missing-Duplicates-Unreferenced
- Specifications: Conversion Requirements → Solutions
- Customization: Adapt Conversion Tools to Conversion Specifications

2. Conversion & Testing Phase

- Trial Conversions
- Regression Testing
 - Online: initialization → Sample → Functional → Stress & Connectivity
 - Batch: Sample → Functional → Simulated Production
- Switchover Rehearsals

3. Implementation Phase

- Actual Conversion
- Switchover
- Initial z/OS Operations

Mass Conversion Tools Overview

1. Automate

- Application inventory verification
- Code conversion / upgrade / compilation-linkedit
- JCL conversion
- File migration

2. Designed for Mass Conversion

- One submission to convert all items
- Fast and resource-thrifty
- Summarized result review + detailed cross-references

3. Customizable

- Generic modifications included
- Options and tables
- Exit routines
- Pre/post-processors
- Ad-hoc integrated or stand-alone developments

Mass Conversion Tool Components

1. Application Inventory

- Acceptance of any VM or VSE format
- Separation of elements per type
- Identification of missing and unreferenced elements
- Cross-references between elements, statistics and counts

2. Language Conversion

- COBOL conversion and upgrade to COBOL for z/OS
- Conversion of other languages: Assembler, RPG II, etc
- Conversion of 4GL: Easytrieve[-plus], DYL260/280, QUICKJOB, etc
- [elimination of non-COBOL languages: RPG II, GENER/OL, etc]
- Mass compilation and linkedit

Mass Conversion Tool Components

3. JCL Conversion

- Understanding of VSE JCL job streams → JCL/files XREF → data flows
- File classification based on data flows
- Utility step conversion
- Generation of z/OS JCL to local standards

4. File Migration

- Generate file migration procedures from JCL conversion-derived data
- Read VSE-created tapes: FAVER2, SORT, IDCAMS, DrD, etc

z/OS Standards

1. Naming Conventions

- Including datasets, jobs, procs, includes, steps, parameter libraries
- Excluding programs, entry-points, copybooks, includes, ddnames

2. JCL Streams

- Including JCL stream structure: run JCL (Job header), JCL procedures, JCL includes, control cards, service steps, etc
- Excluding job/jobset re-definition (If possible)
- Simplified DFSMS/DFPv3-type DD statements

z/OS Standards

3. Utility Steps

- File management steps: sort, copy, backup
- DBMS
- Service steps
- EDI: FTP, email, etc
- CICS and batch “submitters”

4. Automated Operations

- Job scheduler
- Report manager

DFSMS/DFPv3 Simplified JCL

1. Attribute Removed from DD Statements

- VOLSER z/OS catalog
- RECL z/OS at open (except IDCAMS/REPRO output)
- BLKSIZE z/OS at open
- RECFM z/OS at open
- ORG z/OS at open
- DSCB ACS routine provides pattern DSCB for tape files
- SPACE Replaced by DFSMS' data class (DC)
- UNIT (disk files) ACS routine provides default value

2. Attributes Kept in DD Statements

- DSN Application Environment file-id class or job (&&work)
- DISP 9 basic cases identified automatically
- UNIT (tape files) Can be further reduced by using HSM

3. Attribute Added to DD Statements

- DATACLAS S/M/L/XL file sizes

Conversion Team

ConvTek

Experience:

- z/OS
- Conversion tools
- VSE to z/OS conversion
- Project planning & management

Responsibilities:

- Identify & address conv. issues
- Convert in-house applications
- z/OS standards recommendation
- Follow methodology and plan

Customer

Experience:

- Current VSE operations
- Current VSE applications

Responsibilities:

- z/OS system resources
- Application inventory
- Regression testing
- Automated Operations tools

Shared Project Responsibilities

<u>Project Responsibilities</u>	<u>CONVTEK</u>	<u>CUSTOMER</u>
1. Project Management	Overall + ConvTek Internal	Customer Internal
2. HW/SW/Office Space		Provide
3. z/OS System		Install, Support
4. Project Planning	Project, Switchover	Online and batch testing
5. Application Inventory	Receive, Validate	Determine, Supply
6. Conversion Specifications	Develop	Review, Accept
7. Conversion Tools	Provide, Customize	
8. Automated Conversion	Perform	
9. Manual Conversion or Positioning	Identify, Perform z/OS	Perform VSE
10. Online Application Tests	Correct, Support	Perform, Validate
11. Batch Application Tests	Correct, Support	Perform, Validate
12. z/OS Production Tools		Install, Setup
13. Switchover	Prepare, Support	Perform, Support
14. Initial z/OS Operations	Support	Run, Support

Approach Benefits

1. Fast and Predictable

- Reasonable timeframe
- Switchover date and cost known up-front
- Proven approach

2. Less Disruptive

- Single production switchover
- Minimal freeze of VSE application changes
- Minimal disruption to operations and applications support

3. Turn Cost Into Investment

- Internal staff focused on reusable z/OS skills
- Complete and consistent application inventory
- State-of-the-art z/OS production environment
- Positioning for future growth

Thank You

See us at:

WAVV 2007 Booth 5

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