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Introduction to VMSES/E for z/VM

Session 8454

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Agenda



- What is VMSES/E?
- Tools and concepts
- VMFINS for installation
- Service installation

VMSES/E – What is it?



- VM Service Enhancements Staged/Extended
 - A long name for tools developed and introduced over the last 15 years.
 - We will not belabor the history. It is here now, and it works!
- Designed to be *the installation and service tool* for z/VM and associated program products.
- Used for three primary functions
 - product installation
 - service application
 - software inventory management



Definitions and terms



- **Product** - A separately installable software program. Can have several components.
- **Component** - A separate functional unit. CMS is a component of the z/VM product. A component is made of objects.
- **Object** - A software piece. Example: module, exec, nucleus. Objects are built from parts.
- **Part** - The smallest serviceable unit of a product. Example: source file, macros, text decks.
- **Usable form** - Synonym for object. "XYZ EXEC" vs. "XYZ EXC12345"



Definitions and terms (products)

Product "A" is a _____ of product "B" if...

- **prereq** you need to install A before installing B
- **req** you need to install A before you can use B
- **dreq** you need to install a specific level of A before installing B
- **sup** A completely replaces B
- **npre** B cannot be installed when A is installed
- **ifreq** you need to install A before you can use B if a specified product /component C is installed

Definitions and terms (service)



- **APAR - Authorized Problem Analysis Report.**
 - Identifies the problem and solution. APAR numbers against z/VM and its components take the form "VMnnnnnn"
 - The fix may impact one or several parts
 - The fix may update and/or replace parts
- **PTF - Program Temporary Fix**
 - May contain fixes for one or more APARs
 - Identified by a number. Example: UM12345

Definitions and terms (service)



PTF "A" is a _____ of PTF "B" if ...

- **prereq** you need to apply A before applying B
- **hardreq** B has a functional dependency on A (hardreq is a subset of prereq with a logical or line intersection)
- **coreq** you need to apply A at the same time as applying B
- **sup** A completely replaces B
- **ifreq** A and B are not in the same component but need to be applied at the same time. "ifreq" is significant only if you have products/components affected by both.



My Definitions and terms (addendum)



- **uh-oh-req** - you ordered a whole bunch of PTFs and missed one that prevents half of them from applying right
- **rsu-req** – one PTF and 150 prereqs... sheez!
- **loopyreq** – a prereq to a PTF that has a prereq to the original PTF (a.k.a. **oopsreq**)
- **whatifreq** – you go ahead and apply a PTF hoping the ‘other’ support person for the ifreq’d product actually applied their maintenance too

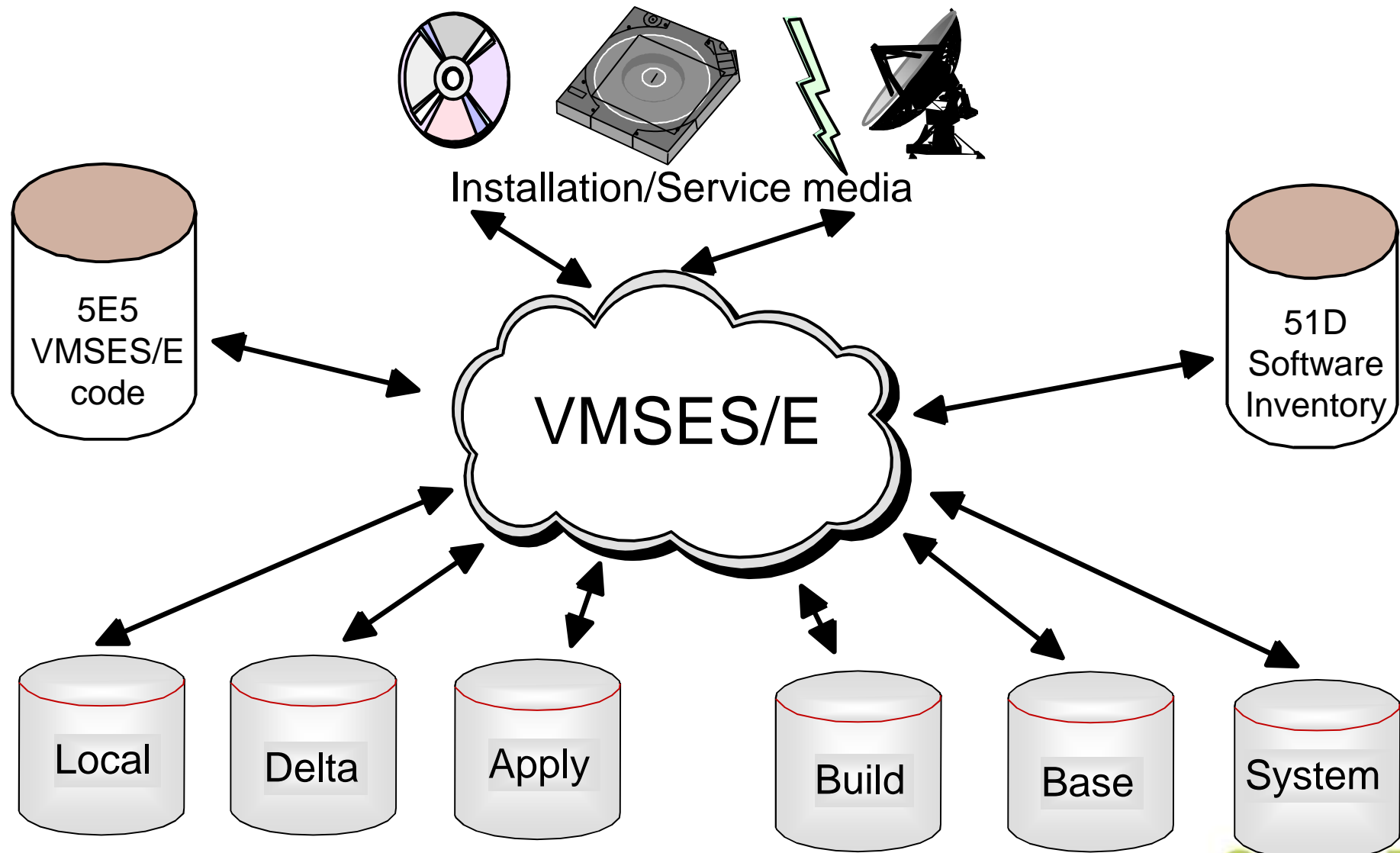
A partial list of VMSES/E commands



VMFAPPLY	VMFPPF
VMFASM	VMFPSU
VMFBLD	VMFQMDA
VMFCNVT	VMFQOBJ
VMFCOPY	VMFREC
VMFENRPT	VMFREM
VMFERASE	VMFREPL
VMFEXUPD	VMFSETUP
VMFHASM	VMFSGMAP
VMFHLSM	VMFSIM
VMFINFO	VMFSUFIN
VMFINS	VMFSUFTB
VMFMRDSK	VMFVIEW
VMFNLS	GENCPBLF
VMFOVER	

The toolbox is well equipped. You will use some of these more frequently than others. You may never have a need for some.

VMSES/E Database layout



Database layout

A-disk (191)	Work disk
B-disk (5E5)	VMSES/E code
C-disk	Reserved for user
D-disk (51D)	System-level Software Inventory
TASK (task)	Files you want accessed before the database
LOCAL	Sample and customized files. Local modifications. Circumvention service
DELTA	PTF (building materials). PTF parts, Apply and exclude lists, description table, requisite table, receive status table.
APPLY	Defines maintenance level. AUX control files, Version Vector Tables, Apply Status Table, Select DataFile, Build Status Table
BUILD	Final usable system. Build lists, Usable forms.
BASE	Original product files. Source, Base object.
SYSTEM	Running system. Files you want accessed after the database.

Design Guidelines



- VMSES/E accomplishes the following using the same principles
 - Installing a product
 - Adding a new copy of a product
 - Servicing a product
- Tasks are accomplished in three independent steps:
 - Receive
 - Apply
 - Build
- All three tasks rely upon information in the Software Inventory

Product Parameter File (PPF)



- Brains of VMSES/E
- Provides script of actions for each tool
- Easily overridden to implement customer preferences
- Each product has a PPF
- Multiple components can be in single PPF file
- Each component area consists of multiple sections
- Tagged data format file
- ZVM PPF used for all z/VM components

Disk management



- VMFSETUP EXEC
 - Function is to access disks and SFS directories required to install or service a product
- You are probably going to use VMFSETUP A *LOT*
- Parameters: a product parameter file name and a component within the PPF

VMFSETUP ZVM CP



Software Inventory



- The Software Inventory (SI) is:
 - A set of flat tables
 - Automatically created and maintained during the installation and service processes
 - Kept at two levels
 - System-level software inventory
 - Service-level software inventory
- Stored separately from the VMSES/E code so that it may be serviced without affecting inventory

VMFSIM functions



- VMFSIM EXEC is used to manage the software inventory by VMSES/E tools. Can be used by you, too. Returns data to display, file or REXX stem.
- VMFSIM ...
 - LOGMOD - inventory (record) local modifications
 - SRVDEP - list the dependent PTFs for a given PTF
 - SRVREQ - list requisite PTFs for a given PTF
 - SYSREQ - list requisite products for a given product
 - CHKLVL - compare control/AUX structure to version vector table
 - GETLVL - identify the latest version of a part
 - MODIFY - update the inventory
 - QUERY - query the inventory
 - COMPTBL - compare two similar tables
 - INIT - initialize an inventory

VMFSIM examples



- Is TCPIP installed?

```
vmfsim query vm sysrecs * tdata :stat :prodid 5735falq
VMFSIP2480I Results for
          TDATA :STAT :PRODID 5735FALQ
:PPF 5735FALQ TCPIP
  :PRODID 5735FALQ%TCPIP
  :STAT RECEIVED.01/22/99.13:21:50.P735FALQ.RSU-9804
```

- What are the requisite products for TCPIP?

```
vmfsim query vm sysreqt * tdata :prodid 5735falq
VMFSIP2480I Results for
          TDATA :PRODID 5735FALQ
:PRODID 5735FALQ%TCPIP
  :PREREQ
  :REQ 2VMVMA30
  :DREQ
  :IFREQ
  :SUP 5735FALF 5735FALG 5735FALJ 5735FALK 5735FALL 5735FALP
  :NPRES
:PRODID 5735FALQ%TCPIPSFS
  :PREREQ
  :REQ 2VMVMA30
  :DREQ
  :IFREQ
  :SUP 5735FALF 5735FALG 5735FALJ 5735FALK 5735FALL 5735FALP
  :NPRES
```



VMFINFO (VMFSIM made easy)



- VMFINFO makes querying your components a lot easier!

```
VMFINFO EXEC
```

```
                .-(NOSetup-----.
>>--VMFINFO--ppfname--compname--+-----+---><
                |      .-NOSetup-.      |
                '-(---+-----+---.---.-'
                   '-SETup---'  '-)-'-`
```

Example: VMFINFO ZVM CPSFS



VMFINFO (VMESIM made easy)



F - VMTEST



File Edit Font Transfer Macro Options Window Help

VMFINFO Main Panel

Select one of the following. Then press enter.

PPF fileid ZVM PPF D
Component name .. CPSFS Setup ... NO
Product ID: 5VMCPR10 System .. VM

Options: S - select

Option	Query
—	Product description
—	Product status
—	Product requisites
—	Product dependencies
—	PTFs/APARs
—	Serviceable parts/usable forms
—	Miscellaneous

MFINF2239I Setup was not performed. Query results may be invalid

Command ==> —

PF1 = Help PF3 = Exit PF12 = Cancel



F - VMTEST



File Edit Font Transfer Macro Options Window Help

Query Output - Product Status

PPF fileid	ZVM	PPF	D	
Component name ..	CPSFS	Setup ..	NO	
Product ID	5VMCPR10	System ..	VM	

receive status: RECEIVED.07/29/04.21:56:49.MAINT.000-0000

apply status: APPLIED.07/29/04.21:56:49.MAINT

Command ==> _

PF1 = Help PF3 = Exit PF5 = File PF12 = Cancel

Installation



Product Installation

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VMFINS for product installation



- VMFINS EXEC is the main exec of product installation support in VMSES/E.
- Use to install new products not previously installed
- Delete products previously installed but no longer needed
- Upgrade previously installed products by replacing currently installed copy or install an additional copy
 - New version
 - New release
 - New service level
- Plan option allows a "dry run" of above functions to allow assessment of resource hits.

Basic installation steps

- **Prepare** – load the informational files
 - VMFINS ... info ...
- **Evaluate** – check your system against the info files
 - VMFINS ... (plan ...
 - Possibly allocate resources if needed
- **Install** – install the product files
 - VMFINS ... (add ...
- **Check that the process worked**
 - VMFVIEW ...
- **Build** – build the new product from installed files
 - VMFINS build ...
- **Check that the process worked**
 - VMFVIEW ...
- **Place into production with product-specific steps**

Service



Service



Service definition



- **Service is the process that:**
 - Corrects software problems
 - Adds function to an installed product
 - Circumvents software problems
 - Allows you to install your own modifications

Types of service



- **Product Service Upgrade (PSU) Procedure**
 - Nondestructive procedure (will not alter tailored files)
 - Upgrades the service level of your system
 - Uses Recommended Service Upgrade (RSU) tape/envelope
 - RSU tape or envelope...
 - contains Pre-built objects and Pre-applied service in addition to PTFs
 - contains service for problems you may not have experienced. Not every PTF that closes is on the RSU. A PTF must meet certain criteria before being made available on the RSU
 - is P.E. managed. That is, if a fix on the RSU is found to be in error, action is taken to either fix the fix or possibly remove the erroneous PTF from the RSU
- **Corrective Service (COR)**
 - PTFs that address specific problems you are having
 - PTF may or may not be on an RSU



Basic steps in servicing z/VM

- **Prepare system for service.**
 - Define virtual storage, access the 5E5 and 51D disks
- **Receive the service documents**
 - VMFREC info
- **Setup the mindisks/directories you need**
 - VMFSETUP ...
- **Merge levels of service previously applied as desired**
 - VMFMRDSK ...
- **Load the files from the service media**
 - VMFREC ...
- **Check that the receive process worked**
 - VMFVIEW rec

Basic servicing steps (cont.)

- **Apply the service**
 - VMFAPPLY ...
- **Check that the apply process worked**
 - VMFVIEW apply
- **Rebuild the actual system component(s)**
 - VMFBLD ...
- **Check that the build process worked**
 - VMFVIEW bld
- **Move serviced components into production**
 - Move tested service into production. Re-save NSS and DCSS, re-IPL CP (if necessary)
- **Some components may have additional steps.**
- **The Service Mantra: Receive, Apply, Build**

VMFREC EXEC - Receive



- Function - to receive the raw materials from service delivery media necessary to apply service and build systems.
- PTFs are received to the DELTA disks
- Uses part handlers to load the PTFs. Part handlers use the software inventory and existence of parts on disks to determine which PTFs and parts should be loaded or not. Part handlers provided are:
 - VMFRCALL - unconditionally loads parts
 - VMFRCAXL - loads apply and exclude lists
 - VMFRCCOM - conditionally loads parts
 - VMFRCPTF - conditionally loads PTF parts lists



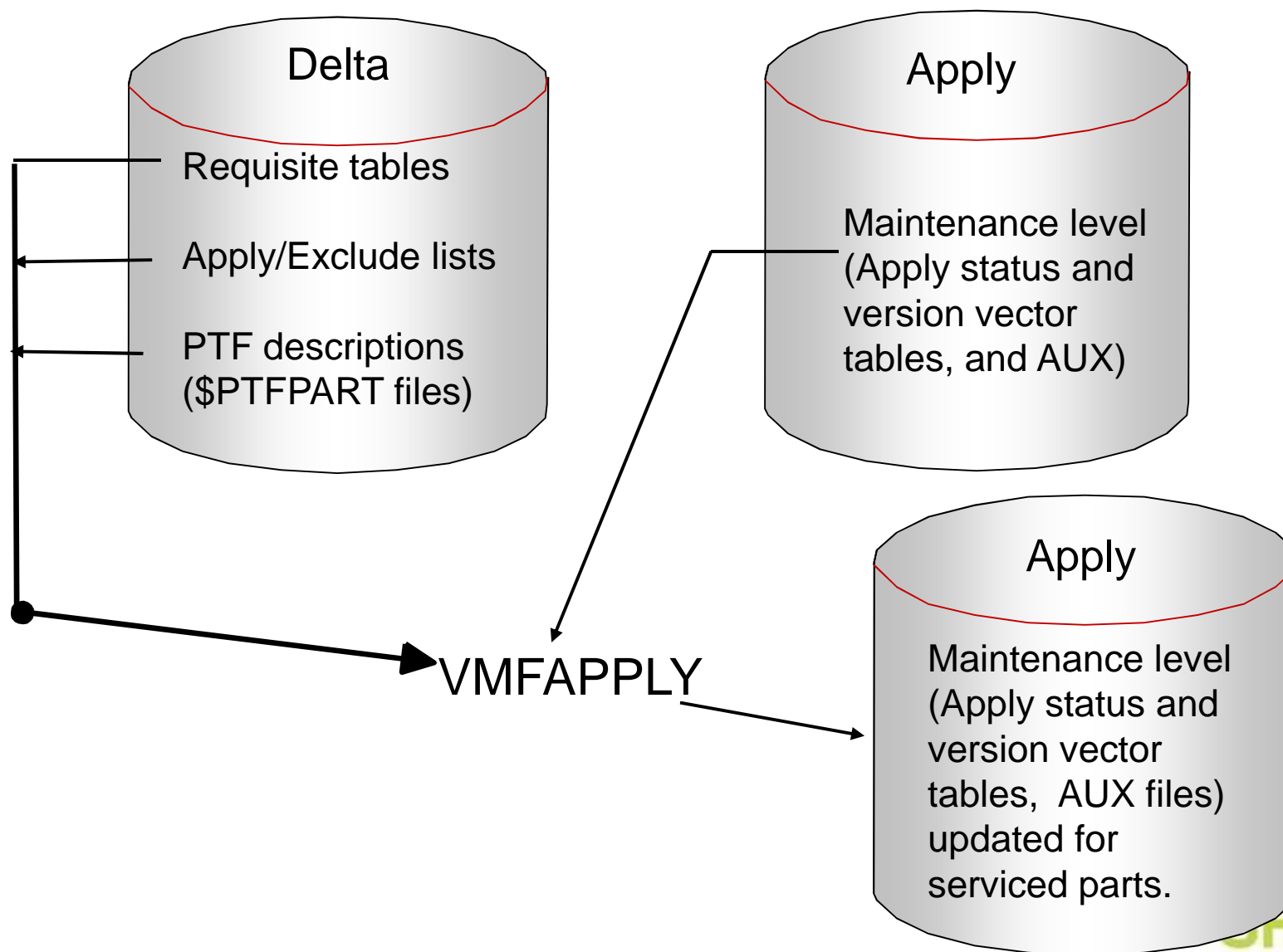
VMFAPPLY EXEC - Apply



- Function - defines new maintenance levels by applying PTFs
- Does extensive checking to assure a PTF is valid before adding to maintenance level.
- You can exclude a PTF by adding it to the EXCLUDE list. PTFs in the APPLY list are applied. APPLY list is pre-pended with new ptf's received from service media
- The VVT defines the hierarchy of maintenance level of each part
- A select data file with filetype of \$SELECT is built on the APPLY disk. It used by VMFBLD to determine which objects need to be built as a result of service



VMFAPPLY...



Apply Status Table



- Contains a list of PTFs that have been applied or superseded for a product or component
- Time stamp and userid responsible included on records
- A "superseding" PTF includes all of the fixes and requisite relationships from all of the PTFs which it supersedes

appid SRVAPPS (Ex: CP SRVAPPS or CMS SRVAPPS)
:PTF.UMRSU21 :STAT.APPLIED.12/10/98.16:38:20.MAINT
:PTF.UM28789 :STAT.SUPED.01/18/99.15:02:49.MAINT
:PTF.UM29084 :STAT.APPLIED.01/18/99.15:02:49.MAINT
:PTF.UM29087 :STAT.APPLIED.01/18/99.15:02:49.MAINT
:PTF.UM29381 :STAT.APPLIED.07/26/99.14:46:25.MAINT



Version Vector Tables (VVT)



- Contains the service history of each part that has been serviced for a product
- Similar in concept to an AUX file
- VVT filetype has same suffix as AUX file suffix. E.g. filetype of VVTVM corresponds to source updates applied at the AUXVM level

```
:PART.DMS3279E HMS :PTF.UM28808.VM61613
:PART.IZPCRTNS TXT :PTF.UM29011.VM61752.B61752DS UM29011.VM61577.B61577DS
:PART.IZPCRPT TXT :PTF.UM29011.VM61752.B61752DS UM29011.VM61577.B61577DS
:PART.IZPCPCHK TXT :PTF.UM29011.VM61752.B61752DS UM29011.VM61577.B61577DS
:PART.IZPCMSG TXT :PTF.UM29011.VM61752.B61752DS UM29011.VM61577.B61577DS
:PART.DMSICP TXT :PTF.UM29011.VM61752.B61752DS UM29011.VM61577.B61577DS
```



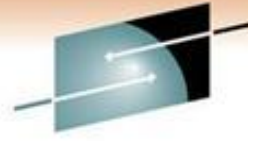
VMFBLD EXEC - Build



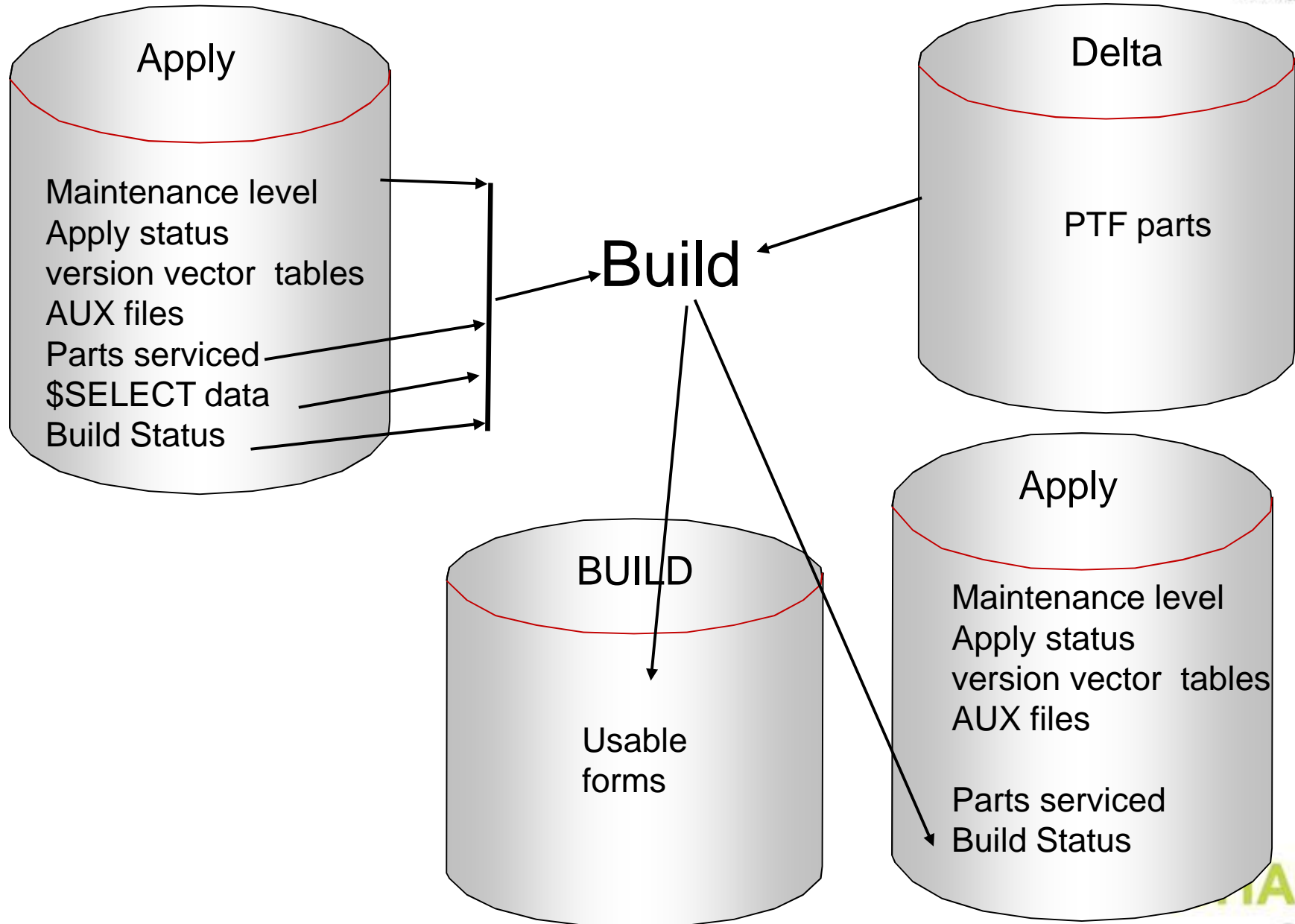
- Function is to build usable objects at the latest service level from the raw materials in the service database
- Reads the Select Data file and product build lists to determine which objects need to be built as a result of service
- Calls part handlers to build objects (modules, segments, nuclei, etc)
- Uses VVT to determine highest levels of parts
- Records results in the Build Status table
- Puts usable forms on the BUILD disk(s) where applicable



VMFBLD...



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SERVICE EXEC



- SERVICE EXEC was added to z/VM to assist in applying RSU/COR service
- Not really meant for sites that have local modifications or non-default installations
- Combines the Receive, Apply and Build processes and does all the checking to be sure all the parts/steps are correct and completed successfully
- Has check-points so that it can restart where it left off “just in case”...

PUT2PROD EXEC



- The companion routine to the SERVICE EXEC
- Used after you run the SERVICE EXEC and are ready to move the new service into production
- Handles all the tasks normally required after service for a production cut-over
 - Including moving files to common disks (ie, 190/19D), building segments, building nucleuses, etc.

Summary



- There is a rich toolbox of tools to perform product install and service for products supporting VMSES/E
- It works! Don't let any war stories concern you!
- Repeat the mantra – *“Receive, Apply, Build”*
- Follow the “Automated Installation and Service” and “Service Guide for z/VM” faithfully when servicing z/VM or its components
- Follow service instructions for other products from their documentation. (Most often the program directory)

Information Sources



- <http://www.ibm.com/vm/service>
- z/VM Service Guide GC24-5993
- z/VM Guide for Automated Installation and Service GC24-6099
- z/VM VMSES/E Introduction and Reference GC24-5994
- VMSES/E Primer: Concepts and Experiences, GG24-3851-02 (Redbook)
<http://www.redbooks.ibm.com/redbooks/pdfs/gg243851.pdf>

Contact Info

Light travels faster than sound, that's why people seem bright until you hear them...



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