



## Some Principles

- **Software maintenance is an art, not a science**
- **Regardless of guidelines, you have to decide:**
  - **How often to do it**
  - **How broadly to do it**
  - **How fast to roll it out**
- **Would you rather have to explain to your boss**
  - **why you did not install a HIPER PTF? Or...**
  - **why you installed a HIPER PTF that went bad?**
- **In the long run, you will win more often than lose betting on the side of the software vendor**

## More Principles

- **"If it ain't broke, don't fix it"**
- **Truth is, it's always broke!**
- **New APARs are taken every day**
- **Classified all the way from FYI to HIPER**
- **You have to decide for your shop, is APAR likely...**
  - **A strain?**
  - **A sprain?**
  - **A compound fracture?**

## Still More Principles

- **NEVER SMPE-APPLY** service to a running system
- **APPLY** only to designated target volume set
- If you decide that risk is justified, copy updated elements to running system
- Use **SMPDATA1** to identify what got hit
  - Must set **GLOBAL OPTIONS** to **CHANGEFILE: YES**
- Perform activation per instructions with PTF, e.g...
  - Refresh LLA (and restart tasks)
  - **\$PJES2,ABEND** (if hotstart indicated)
  - **IPL (!)**
  - If you plan to IPL, consider building alternate sysres

## SMPE Install Environment

- **Install pack-set should be 'isolated'**
  - **Non-IPLing volumes/files per ServerPac naming**
- **SYSRES volume(s)**
  - **One Mod-9 should be enough**
- **CAT volume(s) as needed**
- **DLB volume(s) as needed**
- **USS files**
  - **Managed 'logically' by name associated with OS level**
  - **Can live in regular production SMS pool**

## SYSRES Contents

- **Need not include products you will not run anywhere**
  - **Move those data sets to CAT or DLB volume**
  - **SMPE APPLY/ACCEPT will be happy**
  - **Sysres will have more room for stuff you migrate**
- **Use DSNs same as production, e.g. 'SYS1.dddef'**
- **Decide on method of reference to install DSs**
  - **Must determine at ServerPac time**
  - **Not feasible to modify later**

## Method of Reference to Target Data Sets

- **Leave target DSs uncataloged**
  - **SMPE DDDEFs must include volser**
  - **All access to data sets must include volser**
- **Use 'maintenance' alias, e.g. OSR12 (SCE practice)**
  - **Create level specific catalog with alias in master catalog**
  - **ServerPac does this for you**
  - **Just don't delete alias catalog during install**
- **Reference DSs with full alias name, e.g. 'OSR12.SYS1.LINKLIB'**
  - **DDDEF entries have no volser specified**
  - **Data sets can be accessed without specifying volser**

## Using a Maintenance (Service) Alias

```
listc ent('osr12') all
```

```
ALIAS ----- OSR12  
IN-CAT --- PROD.MASTCAT  
ASSOCIATIONS  
USERCAT--OSR12.MAINTCAT
```

```
listc ent('sys1.linklib') all -  
cat('OSR12.MAINTCAT')
```

```
NONVSAM ----- SYS1.LINKLIB  
VOLUMES  
VOLSER-----R12RES  
ASSOCIATIONS  
ALIAS----OSR12.SYS1.LINKLIB
```

## What to RECEIVE?

- **Deciding what service to RECEIVE**
- **IBM recommends to RECEIVE all, APPLY selectively**
- **Alternative is to RECEIVE selectively, APPLY all**
- **Problem with RECEIVING all available:**
  - **Keeping track of individual break/fix PTFs**
  - **Fixes identified by you or by colleagues**
  - **Usually ordered separately, maybe APPLIED later**
  - **You can use SOURCEID to track if you're impeccably organized ;-)**
  - **I am not ;-(**

## How to RECEIVE?

- **SMPE RECEIVEFROMNETWORK**
  - The best method if you can utilize it in your shop!
  - Tailors order based on your current CSI
  - Includes latest HOLDDATA in the same order
  - Includes any missing REQs in the same order
  - ‘All available’
  - ‘Critical’ (HIPER, PE)
  - ‘Recommended’
  - ‘By APAR number(s)’
    - Best practice if you have to support multiple releases
  - ‘By PTF number(s)’
- **ShopzSeries or ServiceLink SRD**

## What Maintenance to APPLY (Install)?

- **RSU -- the gold standard**
- **FIXCAT -- Fix Category per product group**
  - Many categories: s/w, h/w, next release toleration, etc.
  - Download /s390/holddata/full.txt from [service.boulder.ibm.com](http://service.boulder.ibm.com)
  - Note: only full.txt contains FIXCAT
- **ASAP (ServiceLink) -- PE, HIPER, ATTENTION**
  - You must prime ASAP with FMIDs you want to track
  - Requires re-priming with each new release
- **Break/fix (corrective) service for actual problems**
  - Ordered by PTF/APAR number at any time

## What Maintenance to ACCEPT?

- **Install doc often says RECEIVE/APPLY/ACCEPT**
  - **ACCEPT is safe for new install, maybe not for service**
- **Some shops never ACCEPT sysmods**
  - **Multiple target zones for a single GLOBAL**
  - **Fear of being unable to RESTORE a bad fix**
- **Most shops ACCEPT service judiciously**
  - **Some time after GA date if no problems found**
  - **Use SOURCEID RSU or PUT**
  - **BYPASS(HOLDSYS) but nothing else!**
  - **Don't try to resolve "SUPed by" chains**
  - **You can ACCEPT with NOPURGE, but PTS billows**

## What Maintenance to ACCEPT?

- You may be forced to **ACCEPT** some PTFs in order to **RESTORE** another
- "Element xxx also in PTF xxxnnnnn which has not been **ACCEPTed**"
- You might be able to **RESTORE** multiple sysmods in one step and avoid **ACCEPT**
  - Then re-**APPLY** collateral sysmods
- Otherwise just bite the bullet and **ACCEPT** the intersector
- **Never ACCEPT APAR fixes or usermods!**

# Installing Maintenance: the Process

- **Choose what to APPLY**
  - All; by SRCID(s); by PTF number(s)
- **APPLY CHECK with BYPASS(HOLDSYS)**
  - Never BYPASS(ID) unless instructed by Level 2!
- **Examine CAUSER report in file SMPRPT**
- **Don't be afraid of errors that you can't correct**
  - Unresolvable ERROR HOLD
  - Missing REQ that is not yet available
    - Consider opening PMR to request fix-test
  - Don't obsess over non-zero return code on CHECK
  - Just APPLY what installs without calisthenics

# Installing Maintenance: the Process

- **Examine HOLD records (SMPHRPT)**
  - Focus on ACTION, MULTISYS, etc.
- **If you're comfortable with the outcome, then...**
  - Don't edit APPLY CHECK job JCL
  - Leave it alone for future APPLY CHECKs
  - SDSF 'SJ' and resubmit with 'CHECK' commented out
- **Examine APPLY output as above**
- **Resolve any errors that you can fix**
  - Out of directory entries
  - Out of space
- **Keep resubmitting job until you're satisfied**

## Migrating into Production

- Copy target sysres to alternate IPL sysres
  - Use full volume dump/restore
- Copy USS files to IPL environment
  - Use logical (DS) dump/restore with rename
- IPL from alternate sysres leaving previous **untouched**
- If huge problems occur, re-IPL from previous set
- Always plan for back out to what worked last

## Examples for R12

- **Install (isolated) pack set accessed via alias OSR12**
- **R12RES – Mod-9**
  - Volume contains SYS1.dddef DSs
- **R12CAT – Mod-9**
  - Volume contains SYS1.dddef DSs
- **R12DLB – Mod-27**
  - Volume contains SYS1.dddef DSs
- **USS files SMS-managed in production pool 'OMVS'**
  - Level name qualifier ties zFS logically to level, e.g...
    - OSR12.OMVS.ROOT
    - OSR12.OMVS.JAVA64V6

## Examples for R12

- **IPL (production) pack set**
- **x0nRES – Mod-9**
  - **x = sysplex identifier, n = 01, 02, 03, etc.**
- **USS files SMS-managed in pool ‘OMVS’**
  - **Sysres name qualifier ties zFS logically to sysres, ,e.g...**
    - **OMVS.A01RES.ROOT**
    - **OMVS.A01RES.JAVA64V6**
- **Neither CAT nor DLB volumes are migrated**

# Tracking Maintenance through Migration

- **Consider establishing a naming scheme, e.g. Rnnx**
  - nn is two-digit z/OS release number
  - x is a letter assigned sequentially from A to Z
  - E.g. R12K
- **Level name can be...**
  - Edited into a file in any data PDS(E)
  - Edited into a file in any zFS
  - Zapped into NUCLEUS module IEAVNPC4
    - Console/syslog message at IPL
    - “IEA008I R12K PARMs FOLLOW FOR  
z/OS 01.12.00 HBB7770”

# Questions?

