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 <u>same as production</u>, 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**
  - **<u>All</u> access to data sets must include volser**
- **Use 'maintenance' alias, e.g. OSR13 (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. 'OSR13.SYS1.LINKLIB'**
  - **DDDEF entries have no volser specified**
  - **Data sets can be accessed without specifying volser**

Using a Maintenance (Service) Alias

listc ent('osr13') all

ALIAS --------- OSR13
  IN-CAT --- PROD.MASTCAT
    ASSOCIATIONS
      USERCAT--OSR13.MAINTCAT

listc ent('sys1.linklib') all -
cat('OSR13.MAINTCAT')

NONVSAM ------- SYS1.LINKLIB
  VOLUMES
    VOLSER-----------R13RES
  ASSOCIATIONS
    ALIAS----OSR13.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**
  - **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 xxnnnnn 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 intersectors**
- **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)
  - <u>Never BYPASS(ID)</u> 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 <u>that you can fix</u>**
  - **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 R13

- **Install (isolated) pack set accessed via alias OSR13**
- **R13RES – Mod-9**
  - **Volume contains SYS1.dddef DSs**
- **R13CAT – Mod-9**
  - **Volume contains SYS1.dddef DSs**
- **R13DLB – 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…**
    - **OSR13.OMVS.ROOT**
    - **OSR13.OMVS. JAVA64M1**

Examples for R13

- **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. JAVA64M1**

- **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. R13K**
- **Level name can be…**
  - **Edited into a file in any PDS(E) member**
  - **Edited into a file in any zFS file**
  - **Zapped into NUCLEUS module IEAVNPC4**
    - **Console/syslog message at IPL**
    - **"IEA008I R13K   PARMS FOLLOW FOR z/OS 01.13.00 HBB7780"**

Questions?