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 missingREQs 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 xxnnnnnn which has not been ACCEPTed"
• You might be able to RESTORE multiple sysmads in one step and avoid ACCEPT
  • Then re-APPLY collateral sysmads
• 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)**
  - *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?