IBM AIX Operating System Service Strategy Details and Best Practices

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Contents

Enhanced Service Strategy Releases 3
Contents of a Service Pack 3
Changing the names of the service packs (adding release dates) 4
Changing the M in VRMF 5
Technology Levels Must be Applied as a Group 5
Recommendation to apply the whole SP instead of just individual PTFs 6
Service Pack schedules 6
Technology Level Lifecycle and Support 6
Interim Fix Guidelines/Policy for Maintenance 8
Certified Interim Fixes 8
Security Fixes 9
APAR Numbers for each TL 9
Hardware Support with a Service Pack 9
Moving to a New TL 10
Staying Current 10
Maximum Stability Model 10
Additional Information 10
Summary 10

Introduction

IBM has enhanced the AIX operating system (OS) Release and Service Strategy as part of an ongoing effort to improve the manageability and stability of the AIX operating system for our clients. The enhanced strategy will provide clients with:

- Longer support for each AIX Technology Level update (formerly known as Recommended Maintenance Levels)
- Improved serviceability for AIX throughout the life of each Technology Level
- Support for some new hardware on existing Technology Levels

The previous paragraph came from the IBM AIX Operating System Release Service Strategy paper, which should be read before reading this paper.

This paper will go deeper into some of the changes, give some best practice scenarios and discuss some of the more advanced function available.

Enhanced Service Strategy Releases

The AIX enhanced service strategy will start with AIX 5.3 TL6 and continue with AIX 6.1. AIX 5.2 will not use the new service strategy; TL10 is the last technology level available on 5.2 and we will continue to provide service packs until the end of support.

Contents of a Service Pack

Service packs contain fixes for:

- Customer reported problems (APARs) that cannot wait until the next TL
- Critical problems found by development or test teams
- Very, very limited number of changes to support new hardware. Examples: A new device driver, a new ODM entry to allow for configuration of a new class or type of device, small changes in the kernel to recognize a new processor speed, etc.

The only changes that are allowed in an SP are limited to minimal corrections that do not change behavior or add new functionality. The development team employs a fix rating system to enforce this. New function, both for hardware exploitation and software features, is only shipped in Technology Levels or new releases.

Changing the names of the service packs

Starting with TL6, Service Packs will be labeled with their release date, using the YYWW format, where:

YY = 2 digit year

WW = 2 digit week

An example: AIX 5.3 TL6 SP3 was released in 2007 and the 32nd week of the year, therefore:

5300-06-03-0732

' ' ' '----------YYWW

' ' '----------SP3

' '----------TL level

'--AIX release

The 'oslevel –s' command was updated to report this new name. The nice thing about this is not only can you tell when the SP was released, but you will also know which SP to move to on a new TL. When moving up to a new TL, you must move to a SP that is the same or later than your current SP. The SP number itself (IE SP3) will not be the same, because the Service Packs will be numbered consecutively as they are released, but the dates will tell you where you need to be on the new TL. In general, it is recommended that you apply the latest Service Pack when moving to a new TL.

Figure 1: Service Strategy Service Pack Name Detail

Applying individual PTF updates after a Service Pack will not be shown with the 'oslevel –s' command. Instead, use '***oslevel –s –g 5300-06-03-0732'*** to show what filesets are greater than the specified service pack.

The installp command was changed, as were the updates themselves, to not allow a system to apply any updates that are 'younger' than what is currently installed. This would cause regression. When moving to a new TL, we recommend moving to the latest SP, that way you are guaranteed it will pass the installp regression test.

Using the example above, if you are currently at **TL7 SP8 (5300-07-08-0845)**, then you would not be allowed to install **TL8 SP2 (5300-08-02-0830)**, because 0845 was released after 0830, and therefore will have fixes and hardware enablement that 0830 does not have.

The oslevel –s command will now print out the new SP format, but the other options will not change.

```
# oslevel
5300
# oslevel -r
5300-06
# oslevel -s
5300-06-03-0736
```

The installp command will also stop an update entirely if it sees any updates that are older (released before) in the list it is trying to apply. This is to make sure that part of a SP is not installed, if that was not your intention. If you see a message from installp about not being able to install a fileset update because of regression, then go to a newer SP (the latest) and try the install again.

Changing the M in VRMF

Starting with AIX 5.3 TL7, any filesets that are updated will get a new 'M' in the VRMF. For example, if the bos.rte.lvm fileset was updated, its update in TL7 would be 5.3.7.0 and the first update, in SP1, will be 5.3.7.1. The fileset updates won't necessarily correspond to the SP because an update for fileset bos.rte.install might not come out until SP3, but it would be called bos.rte.install 5.3.7.1. Likewise, if bos.rte.lvm had not changed since SP1, it would still be bos.rte.lvm 5.3.7.1 in SP3.

Technology Levels Must be Applied as a Group

Technology Levels must be applied as a group, using the 'smitty update_all' or 'install_all_updates' commands. Installing a Technology Level is an "all or nothing" operation. Initially, the plan was to add requisites to glue the TL together, but this was not done because of the complications of circular requisites. But, installing a partial Technology Level will not be recognized from a support standpoint.

Before applying a TL, you should always create a backup and plan on restoring that backup if you need to rollback to your previous level. Or, use alt_disk_install or multibos as a way to get back to your previous level. Technology Level updates should always be committed because they cannot be rejected. Committing the updates saves space in the / and /usr file systems and also makes it easier to track and reject service pack PTFs.

After the TL has been successfully applied and tested, another backup should be taken for disaster recovery situations.

Recommendation to apply the whole SP instead of just individual PTFs

For planned maintenance windows, customers are encouraged to apply Service Packs as a group, to simplify inventory and make it easier to report levels to service. Fix Central and SUMA will now download the entire SP for a specified APAR (search function). This was also done to simplify the ordering process.

For more information on Fix Central changes, see the paper:

Fix Central changes supporting AIX Service Strategy at
http://www14.software.ibm.com/webapp/set2/sas/f/best/home.html.

Even though the entire SP is downloaded, individual fileset updates or APARs can **still** be applied with SMIT ('smitty install_by_fix') or from the command line (installp or instfix). There is nothing in the Service Pack that glues all the updates in a Service Pack together. While most of the testing that occurs in the regression test lab is done as a group, applying individual updates is still fully supported.

For unplanned application of fixes (like security or HIPERs), changing the minimum amount of code is certainly the desired outcome.

For example:

- An interim fix was just released for a security issue and it requires an update from a service pack.
- The service pack would require a reboot of the system whereas applying just the individual PTF would not.

In these cases, just applying the individual APARs/PTFs may be the best solution. Service Packs, because they will always require a reboot, are recommended for planned maintenance windows or if the application of the fix will require a reboot anyway.

Service Pack schedules

Because there will be more Technology Levels shipping new fixes and because the Service Packs will be lined up to come out at the same time (with the same YYWW), the SP release schedules will be increased to approximately every 12 weeks. Occasionally, if a very critical problem is found (high severity security, for example) and it cannot wait for the next SP, a 'standalone PTF' will be released and will be made available via APAR search on Fix Central. The PTF will be included in the next Service Pack.

Technology Level Lifecycle and Support

With a valid Software Maintenance Agreement (SWMA), customers can continue to open PMRs to ask questions and report problems with AIX 5.2, AIX 5.3 and AIX 6.1. However, if a code defect is identified (i.e. an APAR is created) then the release and TL must be in the 'New Fixes Available' period to request a fix. This applies to both interim fixes and Service Pack updates.

More information about the System p Product Lifecycle dates can be found at:

http://www.ibm.com/software/support/systemsp/lifecycle

The following chart illustrates the entire lifecycle of a technology level, showing both the times where new fixes are delivered and when it is still supported via PMR for how to and usage questions and problem determination.

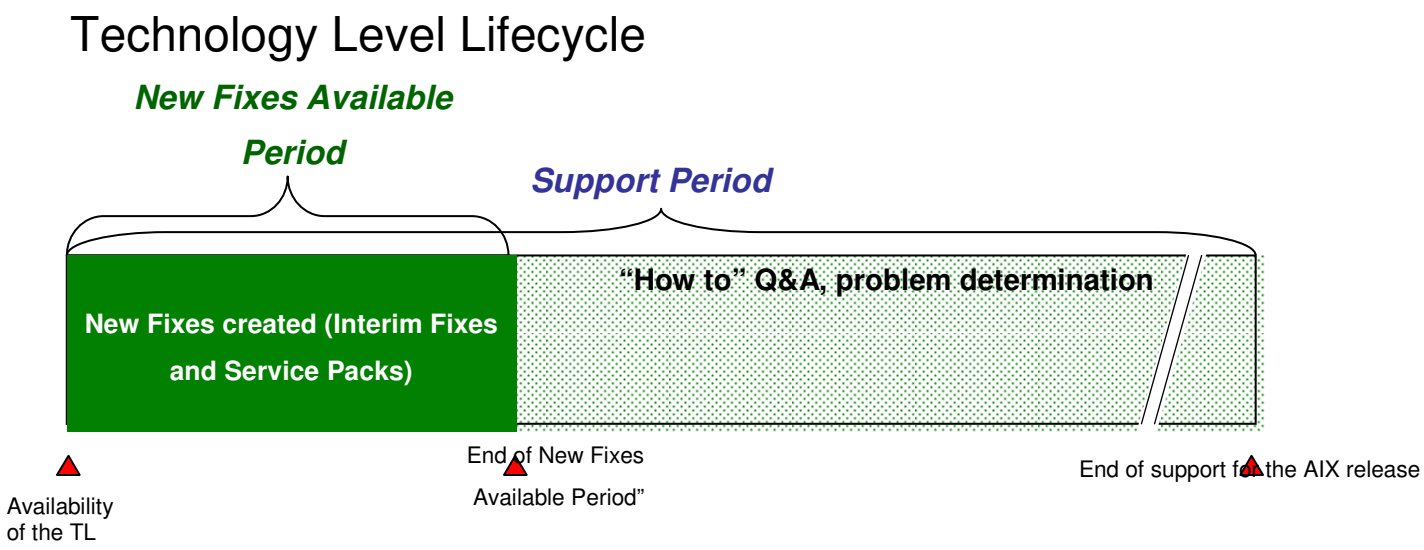

Figure 2: Technology Level Lifecycle

The chart below is a listing of the technology levels that have been released in the last two years. The chart highlights the differences in the timeframes of when fixes were available. AIX 5.2 TL8 and TL9 fell under the old service strategy and had a shorter time period of fixes, about one year from release. The new strategy allows new fixes to become available for approximately two years after release. Use this chart for comparison and planning.

Release	Release Date	Fixes Available Until
AIX 5.2 TL8	Feb-06	Feb-07
AIX 5.2 TL9	Jul-06	Nov-07
AIX 5.2 TL10	Jun-07	4/30/2009 **
AIX 5.3 TL5	Aug-06	11/30/2007
AIX 5.3 TL6	Jun-07	5/30/2009
AIX 5.3 TL7	Nov-07	2 years later
AIX 5.3 TL8	April-08	2 years later
AIX 5.3 TL9	Nov-08	2 years later
AIX 6.1 TL0	Nov-07	2 years later
AIX 6.1 TL1	April-08	2 years later
AIX 6.1 TL2	Nov-08	2 years later

Figure 3: New Fixes Available – NOTE: All future dates are subject to change.

* New Fixes will be made available until two years later or when the new TL is offered. In some cases this may mean slightly less than two years of support, in some cases it may mean slightly more. AIX will only make new fixes available for up to four Technology Levels for each release at any given time.

** For 5.2, the date for 'Fixes Available Until' and End of Support are the same date.

When selecting a TL for upgrade, keep the 'New Fixes Available' period in mind. The recommendation is to move to the latest TL and the latest SP when performing an upgrade, to get the longest period of support.

Interim Fix Guidelines/Policy for Maintenance

Interim fixes are fixes made available to our customers to offer relief for a problem until the customer is able to update to a Service Pack or Technology level that contains the fix. The general rule is that a customer can request an interim fix for Technology Levels that are in the 'New Fixes Available' period; it will then be evaluated by development. Development will make every attempt to supply an interim fix, however, there may be some that cannot be supplied due to complexity.

Here are the guidelines that the Service team will be following:

- If a client is at the latest level and finds a problem – they can request an Interim Fix
- If a client finds a problem that is already in a later SP - they will be asked to install the latest SP (or, at a minimum, the Service Pack that includes their fix or individual PTF that contains the fix)
- If it is a critical problem and/or the client can't install a SP - an interim fix can be requested, however it is recommend they move to the latest SP during their next maintenance window
- If a client finds a new, unique problem at any level that is making new fixes available - they can get an Interim Fix on their current level (if it's possible)
- If a client finds a new unique problem on a prior SP and has multiple Interim Fixes installed, which are included in a later SP - they must move to the latest SP before getting another Interim Fix
- If a client has multiple Interim Fixes and only some of them are in a later SP - they may be asked to move to the latest SP and another Interim Fix will be bundled with their prior Interim Fixes on the latest SP
- Clients should update to the SP that contains the fix as soon as they are able

Certified Interim Fixes

Interim fixes are offered to customers as a faster way to get temporary relief for a problem. Interim fixes are shipped in 'emgr' format instead of installp format. Interim fixes are also tracked via the 'lslpp –L' and 'emgr –l' commands.

Some interim fixes get additional functional and regression testing before they are released. These interim fixes are usually intended for a wider audience than other interim fixes, which are specific to a single customer.

Examples of certified Interim Fixes are security fixes that are released thru a vulnerability advisory or subscription notification.

Security Fixes

Security fixes for security vulnerabilities are published thru advisories. Customers will continue to be notified of security fixes by notices from IBM Subscription services at:

http://www14.software.ibm.com/webapp/set2/subscriptions/pqvcmjd

The security fixes published in the vulnerability advisories are posted here:

ftp://aix.software.ibm.com/aix/efixes/security

In the past, security interim fixes were offered for a longer period than other fixes to allow customers time to transition to the current levels. But, because the enhanced service strategy allows new fix availability for a longer period (even longer than the previous security fix policy of 3 total TLs), security fixes will be made available for the same time period as all other new fixes (see chart above). This offers consistency to the service strategy in regards to types of fixes offered in the New Fixes Available period.

To assist our customers with the transition to AIX 5.3 Technology Levels that support the enhanced service strategy, we will continue to generate 5.3 TL5 security interim fixes until 5.3 TL9 is shipped in 2H08 (approximately 10/2008). AIX 5.2 TL8 and AIX 5.2 TL9 support of security interim fixes will continue until 6/2008. AIX 5.2 TL10 will continue to be supported via Service Packs and interim fixes until end of support in April, 2009.

APAR Numbers for each TL

In the past, if a problem existed in two releases, only one APAR number was created for each release. Starting with AIX 5.3 TL7, a new APAR number will be created for every Technology Level where the problem is fixed. When PTFs were only made available on the current TL, only one APAR number was required. Now that multiple service streams exist per release, an APAR must be created for each one where a new fileset update (PTF) will be shipped.

If you've been given an APAR number for a particular problem, do a 'Fix Search' in Fix Central to verify the APAR number with the Technology Level. The search will return results for the other 'sister' APAR numbers, APAR numbers for the same release (e.g. 5.3) but different TLs, and also 'cousin' APARs for other releases (e.g. 6.1). The search will also show availability of the APAR and allow signup for a subscription notice if it has not been released.

For more information on searching for APAR and fixes, see the Fix Central paper at: http://www14.software.ibm.com/webapp/set2/sas/f/best/home.html.

Hardware Support with a Service Pack

When new hardware is released, the required TL's or SP's will be published in the release notes and RFA (Release For Announce). If the TL is still in the 'New Fixes Available' period, then the latest SP will have the hardware support.

If new boot media is required for an existing TL, then it will be made available for web download (ISO image) via the PRPQ process.

If you currently have the TL in your environment, then updating to the required SP and creating a mksysb backup media or image (NIM) will allow boot and install of the new hardware systems.

Moving to a New TL

You should move to a new TL:

- If your existing TL is out or is about to go out of the New Fixes Available period
- You want to use new function and/or features in a new TL. Hardware exploitation, such as large page space or new software function, such as multibos, will only be released in a TL.
- You are going to test a new level for distribution into your production environment and want to get the longest period of new fixes available. In this case, you should move to the latest TL.

Staying Current

If you are currently running on a TL where new fixes are being made available, then any SP will be supported for your interim fix needs. But, the risk in not updating to a service pack that contains your fix during a planned maintenance window is that you will require another interim fix to the same file. See the Interim Fix Guidelines for more information.

Updating twice a year to a new SP or TL is recommended to stay current.

Maximum Stability Model

Realizing that customers appreciated and relied on the CSP for planning their maintenance, and realizing that having a specific SP to recommend to customers that want to maintain the most stable environment and do not plan on moving up to a new SP before moving to a new TL, we would recommend using the SP that roughly would be delivered in the same time frame as the CSP. We would recommend planning around SP3.

This is not to say that other Service Packs in the TL are less stable than SP3, but because the TL has been out a few months and any major issues have usually been identified by that point in time, and there is still more than a year left for service, SP3 is a good one to target and our recommendation for maximum stability. This recommendation is meant as guidance for planning. Individual situations may require applying earlier or later SP's, depending on circumstances.

Additional Information

The IBM Service and Support Best Practices for UNIX® servers Web page at http://www14.software.ibm.com/webapp/set2/sas/f/best includes additional information on the AIX Release and Service Strategy, and best practices for managing the AIX and System p™ servers.

The **F**ix **L**evel **R**ecommendation **T**ool (FLRT) is a planning tool to help administrators determine what key components of your System p server are at the minimum recommended fix level. It can be found at: http://www14.software.ibm.com/webapp/set2/flrt/home.

Summary

The new AIX service strategy will offer customers more options for maintenance in their environment. Two years of new fixes per TL will help simplify and reduce cost for maintenance. Supporting new hardware on existing TL's will reduce complexity in customer environments.

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