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IBM z/OS Continuous Delivery

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z/OS Continuous Delivery

Consumer expectations rose with the advent of the digital age, and are likely to continue to rise as technologies continue their advancement.

The adoption of agile methods and new approaches to delivering business applications that use the new technologies, such as mobile, cloud, and real-time analytics, present demands on IBM® z/OS® and its associated software products, including IBM DB2®, IBM IMS™, and IBM CICS®. Each area changed its approach and provides new functionality regularly to meet the demands.

How z/OS, IMS, CICS, and DB2 provide continuous delivery differs because of the unique role each plays. This IBM Redpaper™ publication describes z/OS continuous delivery.

What is z/OS continuous delivery?

For z/OS-based infrastructures that want to selectively implement new functionality at the earliest opportunity, continuous delivery offers opportunities through increased cadence in appropriate areas.

z/OS covers a substantial range of functionality. Some of these areas are better-suited for continuous delivery (such as SDSF and z/OSMF). Other areas align more closely with the version and release delivery cycle because they are more complex and might be tightly integrated with the microcode and hardware, for instance.

The z/OS continuous delivery complements your site's z/OS software maintenance and development strategy and can be absorbed into processes.

The z/OS continuous delivery also provides more granular opportunities to implement new functionality during the systems software maintenance cycle, as shown in Figure 1.

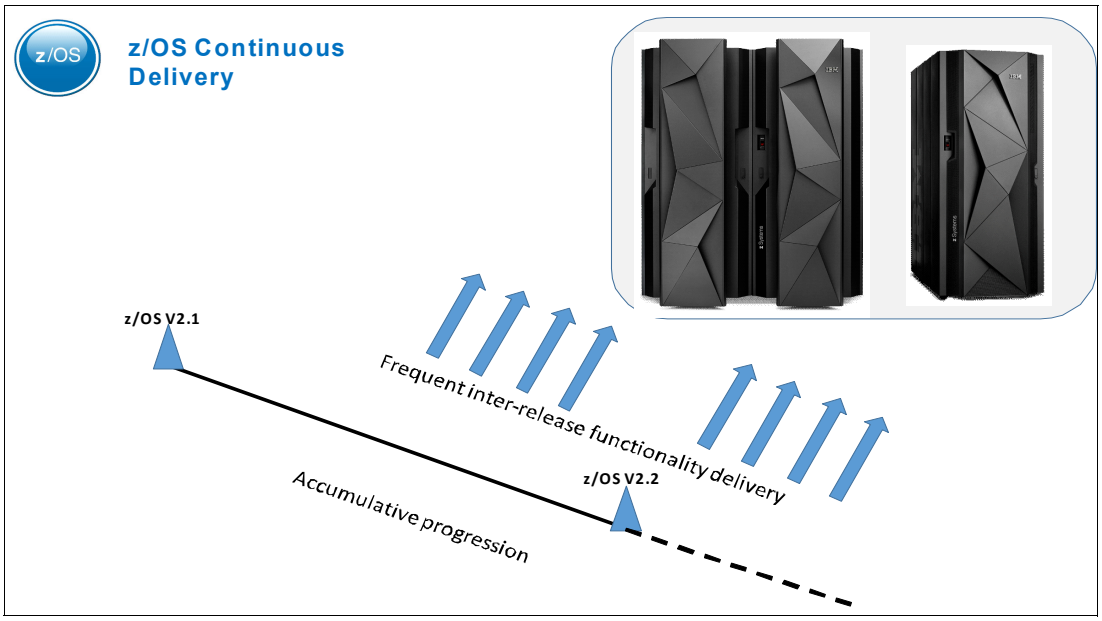

Figure 1 Inter-release continuous delivery

The z/OS continuous delivery offers discreet additions of functionality that you can choose to deploy on specific logical partitions (LPARs) or across sysplexes.

How continuous delivery can fit in with your strategy

Each IT department features a z/OS preventive system software maintenance and development strategy to meet local requirements. This type of strategy often is designed with the following objectives:

- Avoid known defects through the application of software maintenance.
- Maintain operating system support levels for new hardware.
- Include sufficient software levels to accommodate applications that use new technologies.
- Tightly integrate the operating system with the hardware, firmware, middleware, business applications, infrastructure management, security needs, and external collaborations.

The strategy also includes corrective maintenance aspects; however, these aspects are not included within the scope of this IBM Redpaper publication.

Two basic drivers are behind the objectives: availability and functionality. The availability driver refers to protecting the system availability, which often includes applying software maintenance for known defects to reduce the risk of experiencing unplanned outages. Functionality also is a form of availability in that if systems fall back a level, they lack the appropriate software levels to enable new functionality and the option to use that functionality is unavailable.

Achieving the strategy's objectives avoids the situation whereby the infrastructure becomes unable to support the new business applications that want to deploy to z/OS.

Each IT department has unique requirements and considerations for implementing change. The infrastructure must meet many expectations and some of these expectations can appear to conflict.

On the one hand, new functionality that gains business advantages ought to be introduced at the earliest opportunity. Also, system software maintenance levels must be high enough to reduce the risk from known defects. However, stability must be maintained with minimal disruption, and the opportunities to introduce new functionality through planned outages are competing with agile business application delivery and the demands of digital-started transactions. z/OS continuous delivery aims to provide you needed functionality in a timely manner while still delivering solid regression quality to not affect operations.

The z/OS continuous delivery model provides the opportunity to advance the availability of new functionality. When that new function arrives via the service stream or version or release upgrades, this process can provide you with a balanced approach by receiving some functions sooner than others. When new functions are provided via the z/OS service stream, the Recommended Service Units (RSUs) process is in place to provide a quality test in a robust environment for those program temporary fixes (PTFs).

The z/OS continuous delivery might use small programming enhancements (SPEs) to deliver the functionality (see Figure 2).

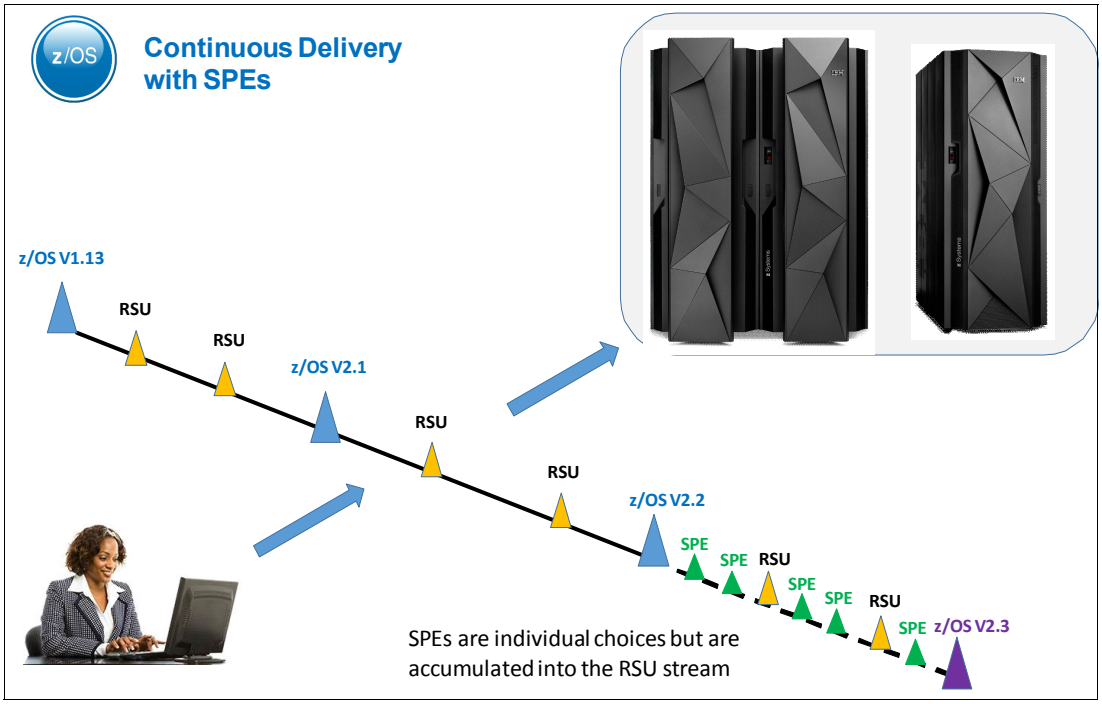

Figure 2 SPE option to gain early functionality improvement

IBM z/OS development takes base quality seriously. Several software development techniques are employed to protect users from the new functions if those users do not intend to use them.

SPEs are also included in the RSU stream per RSU guidelines so you can wait for the RSU if you want to install more than one SPE in a single instance. However, but waiting for the RSU extends the time to wait for the new functionality to be available on your systems.

Functionality rollback

Where applicable, z/OS continuous delivery offers new functionality rollback that helps by managing mixed levels of z/OS.

In certain cases, the SPE functionality can be implemented on lower-level systems, as shown in Figure 3.

Note: The option to roll back new functionality to a lower-level system is not available in all SPEs. Where it is available, the documentation indicates the required PTFs for the supported lower-level systems. In some instances, the PTFs for lower-level systems are for toleration only and does not enable the new functionality.

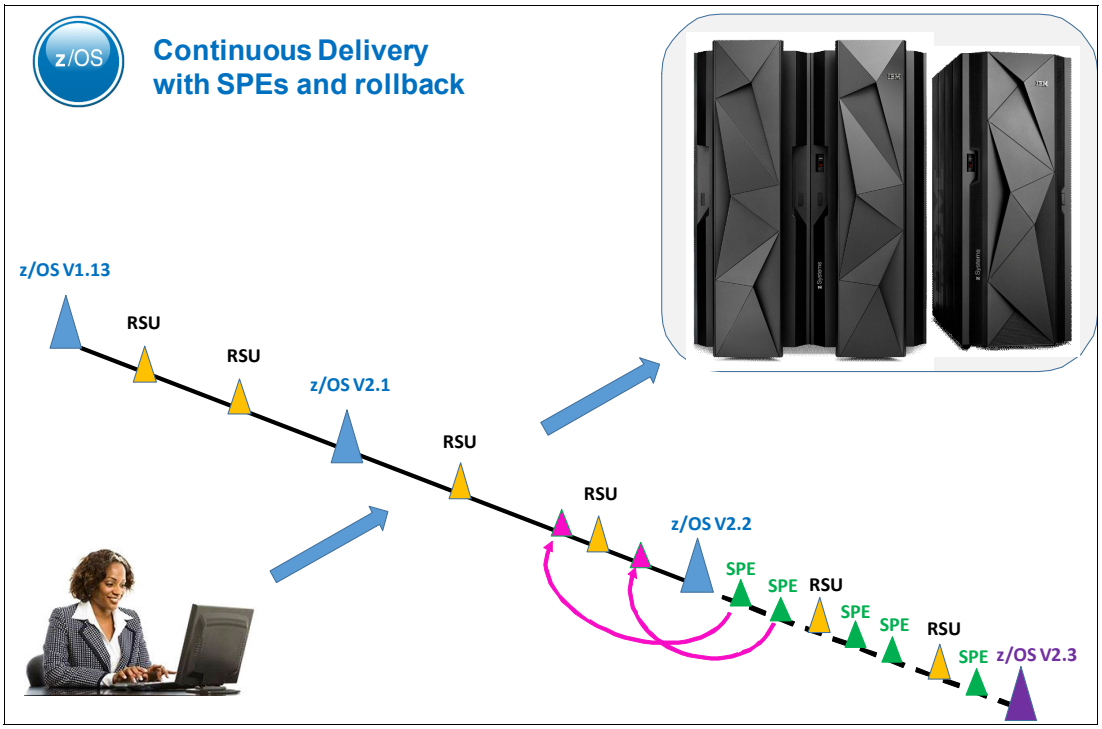

Figure 3 Some SPEs might be eligible to roll back to a lower-level system

Rollback might be useful for introducing new functionality into a lower-level system. An example might be a Sysplex that includes members at z/OS V2.2 and z/OS V2.1 The migration to V2.2 might be in progress; however, new functionality in a particular SPE for z/OS V2.1 can provide an advantage if it is deployed to the z/OS V2.1 systems in the sysplex before the complete conversion to z/OS V2.2.

As good practice, you can check that any upper level PTFs are also installed so that functions are not regressed whenever PTFs are installed on lower level releases in a shared environment.

Note: At the time of this writing, the product publications are updated only for the higher release of operating system (in this case, z/OS V2.2) but are *not* updated for the lower-level z/OS V2.1. Where appropriate, an IBM Redpaper publication might be available to provide you with information about and examples of deploying and using the new functionality that is provided from z/OS continuous delivery.

The current aim is to provide the SPEs turned off by default. They might be enabled by performing the appropriate actions as described in the supporting documentation or HOLD information that is provided in the PTF. Be sure to research your IBM and third-party vendors for required tasks, such as toleration maintenance, and to assess the effect on your current operational setup; for instance, automation message handling. Enable the new functionality only when you have all of the prerequisites in place. Always check the PTFs for instructions and references about how to implement the new functionality.

You might see scenarios in which the implementation steps for the new functionality are provided in z/OSMF Workflows. It is expected that providing this information will be more common in the future. For that reason, it is recommended that you activate z/OSMF and increase your skills in areas (such as Workflows) to use the functions in a timely manner (see Figure 4).

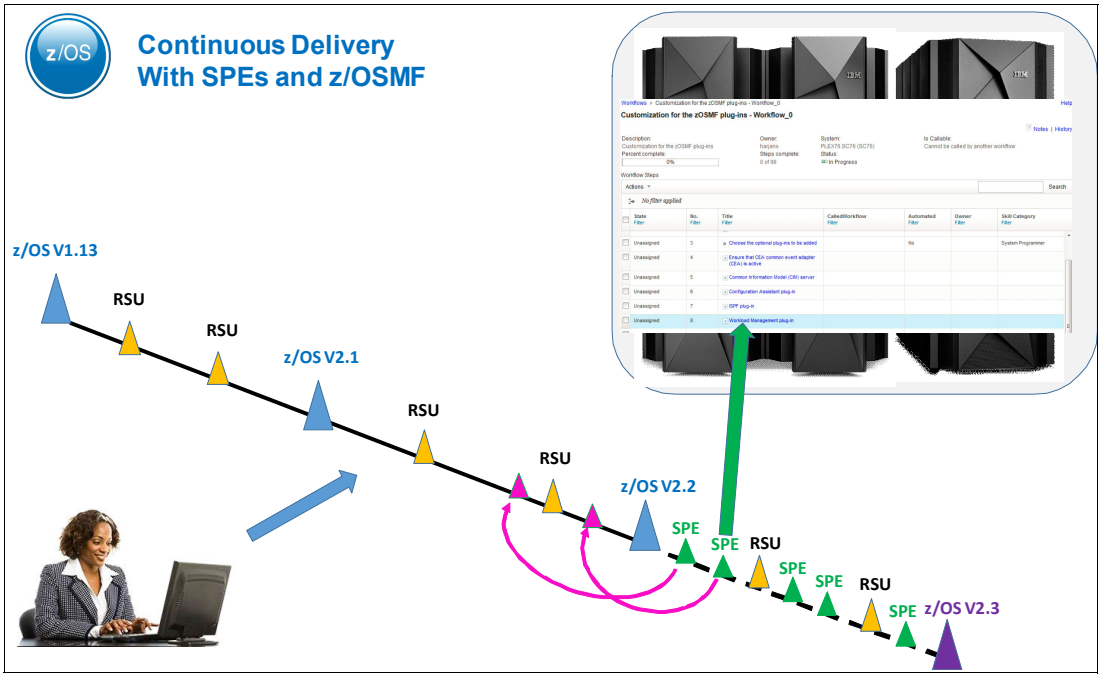

Figure 4 z/OSMF Workflow scenario

The role z/OSMF plays in each SPE varies according to the SPE's content and the necessary implementation tasks. The aim is to ease the implementation effort and provide a demonstrable consistency and accountability.

New function APAR notification

For more information about new functions that are available through z/OS continuous delivery, see the New Function APAR Notification page that is available at the following website and shown in Figure 5 on page 6:

`http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS5188`

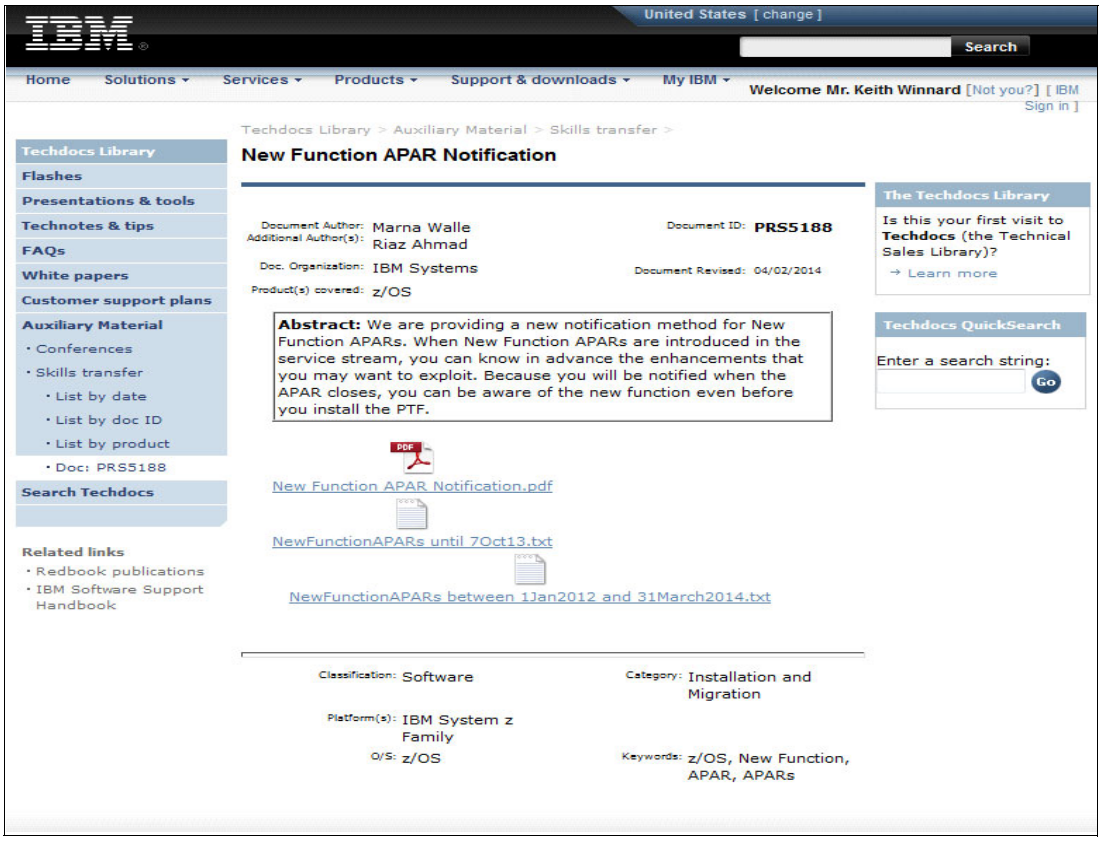

Figure 5 New Function APAR Notification page

Summary

z/OS continuous delivery offers the following opportunities:

- Select new SPE functionality and turn it on where it is most effective.
- Gain the advantages of the SPE's functionality before the next release availability.
- If available, implement the SPE functionality to lower-level systems. Check higher systems to avoid new functionality regression.
- Reduce the risk of introducing a large change at release level by implementing SPE functionality earlier.
- Use z/OSMF workflow if it is available with the SPE.
- Check notifications to keep up-to-date with opportunities for implementing new functionality.
- Absorb the SPE process into your normal system software update cycles.

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