



IBM System Recovery Boost

Frequently Asked Questions

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Instant Recovery

What is Instant Recovery on IBM Z®?

Instant recovery is a strategy designed to provide the industry's highest level of availability by leveraging a combination of key IBM Z platform capabilities:

- **Single-server availability** can be achieved with IBM Z architecture and design, including the many unique reliability, availability and serviceability characteristics integrated throughout the stack.
- **Site-level availability** can be achieved with Parallel Sysplex, a clustering technology that allows concurrent access to all critical applications and data, enabling near-continuous availability without impacting performance or data integrity.
- **Cross-site availability** can be achieved with GDPS® solutions, designed to provide not only the resource sharing, workload balancing, and near-continuous availability benefits of a Parallel Sysplex environment, but to also enhance the capability of an enterprise to recover from disasters with minimal impact.
- **Data availability** for disk subsystems can be achieved with GDPS HyperSwap® technology, which provides the ability to dynamically switch to secondary volumes without requiring applications to be quiesced.

With the new IBM z15™, we're introducing System Recovery Boost, the latest component of our instant recovery strategy that's designed to maximize availability of mission-critical workloads by reducing the duration and impact of downtime, planned or unplanned.

System Recovery Boost

What is IBM System Recovery Boost on IBM z15™?

Built into IBM z15, System Recovery Boost is an innovative solution that diminishes the impact of downtime, planned or unplanned, so you can restore service and recover workloads substantially faster than on previous IBM Z generations *with zero increase in IBM software MSU consumption or cost.*

With System Recovery Boost, you can use your already-entitled Central Processors and zIIPs to unleash additional processing capacity on an LPAR-by-LPAR basis, providing a fixed-duration performance boost to reduce the length and mitigate the impact of downtime:

Faster shutdown

Accelerate image shutdown to prepare for planned shutdown activities.

Faster GDPS automation actions

Drive faster and more efficient GDPS automation actions to rapidly reconfigure and recover your environment.

Faster restart & recovery

Expedite the restart and recovery of images, middleware environments and client workloads to accelerate return to pre-shutdown SLAs.

Faster elimination of workload backlog

Utilize additional capacity for a fixed period during recovery, so you can process backlog faster after planned or unplanned downtime.

How will System Recovery Boost bring value to my organization?

System Recovery Boost can provide improvements of up to:

- 2x faster return to pre-shutdown SLA's
- 2x faster processing of transactional backlog
- 2.5x faster processing of batch backlog
- 4x faster GDPS automated startup, shutdown, site switches, etc.

There are a number of scenarios in which organizations can benefit from accelerated recovery, including planned maintenance, unplanned downtime, and disaster recovery testing and site switching.

Planned maintenance

While demand for patches and updates is growing, the time windows to conduct such maintenance is decreasing.

Unplanned outage

When rare emergencies occur, the pressure is on to get the system back up and running as quickly as possible.

DR testing and site switching

Disaster recovery testing is done infrequently (or not at all) because the process is considered long and relatively complicated.

With System Recovery Boost:

- Accelerate planned maintenance
- Perform more updates within designated service windows
- Meet SLAs with time to spare and catch-up on backlog

With System Recovery Boost:

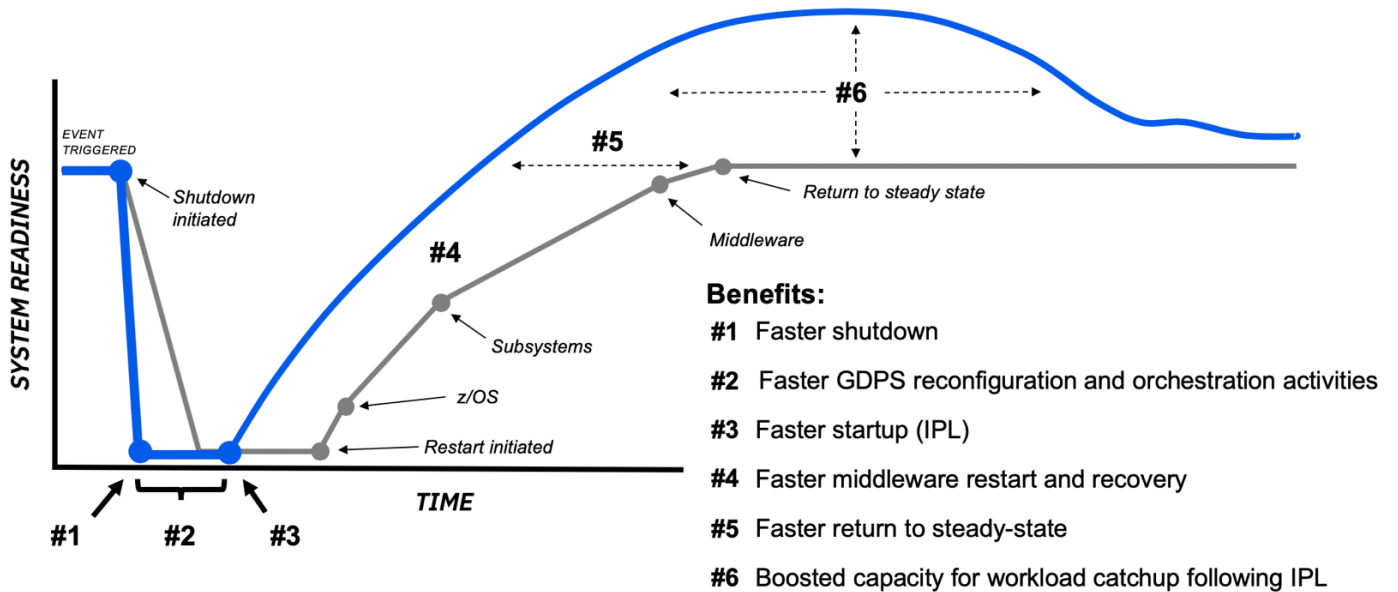
- Turbocharge service delivery
- Avoid workload bottlenecks
- Minimize business disruption

With System Recovery Boost:

- Perform faster and less disruptive site switches
- Accelerate and simplify DR testing
- Meet DR compliance standards

Consider this representation of a planned outage with/without System Recovery Boost:

- Without System Recovery Boost
- With System Recovery Boost



How does System Recovery Boost work?

System Recovery Boost provides a fixed-duration performance increase known as the “boost period,” which can be used twice per IPL (30-minute boost for shutdown, 60-minute boost for startup). The performance increase that occurs during the boost period is comprised of three primary functions: Speed Boost, zIIP Boost, and GDPS enhancements.

Speed Boost

Enables general-purpose processors on sub-capacity processors to run at full-capacity speed in the image(s) being boosted.

Speed Boost will improve the recovery time of exploiting operating systems when running on a sub-capacity CPC. If you are running on a sub-capacity CPC, then while System Recovery Boost is active, z/OS® will request that the CPC firmware increase the CP speed of the image to full capacity model speed for the duration of the boost. Speed Boost applies only to the image being boosted. After the boost ends, the image will return to the sub-capacity model speed.

zIIP Boost

Provides additional capacity and parallelism by enabling general-purpose workloads to run on zIIP processors that are available to the image(s) being boosted.

zIIP Boost can improve z/OS recovery time, assuming zIIP capacity is available to the image. z/OS is the only operating system that can exploit the zIIP Boost capability, as it's the only OS that can natively exploit zIIPs. While zIIP Boost is active, z/OS will start blurring the zIIPs in with the CPs, by making normally CP-only eligible work zIIP eligible, thus allowing most work to run on zIIPs if there isn't sufficient CP capacity available. This provides additional capacity and parallelism to accelerate processing during the boost periods.

GDPS Enhancements

Increases the speed at which GDPS drives hardware actions, along with the speed of the underlying hardware services.

The GDPS Enhancements are a combination of changes to GDPS processing/scripting itself, and GDPS taking advantage of new functionality being offered by the z15 Support Element. Various APIs used by GDPS on the SE are being streamlined and improved, while GDPS itself will be doing more in parallel when possible. In addition, GDPS will be enhancing its scripting language to allow multiple systems to be addressed in parallel by some commands, as opposed to sequentially as before, and making changes to some control flows to improve efficiency.

How much does it cost to use System Recovery Boost?

System Recovery Boost is built into the IBM z15. No increase in IBM z/OS software license charges for sub-capacity MLC or IPLA products will result from use of System Recovery Boost.*

How are ISVs handling IBM System Recovery Boost?

System Recovery Boost is largely transparent to middleware and software applications in general, so very little in the way of explicit ISV support is needed or expected.

ISVs have been supportive of the Speed Boost and Processor Capacity Boost technologies and IBM does not expect ISVs to increase the pricing of their products due to the presence of Boost periods (but this is up to the discretion of the ISVs).

Is it possible to get more capacity to utilize during the boost period?

Yes, see [What is the Temporary Capacity Record](#) for more information.

System Recovery Boost Upgrade

What is System Recovery Boost Upgrade?

In addition to the Speed Boost, zIIP Boost and GDPS enhancements capabilities that are included with z15 at no additional charge, you also have the option to unlock even more zIIP capacity via System Recovery Boost Upgrade, a new capacity on demand offering that lets you maximize performance and parallelism during the boost period.

System Recovery Boost Upgrade lets you use a new type of temporary capacity record to unlock up to 20 additional zIIP processors that can be used for up to 6 hours. These previously un-used engines provide additional processor capacity and parallelism and can be used in conjunction with one or more of the base functionality zIIP boosts.

System Recovery Boost Upgrade is simple to purchase and activate via [a set of z15 hardware feature codes](#), with no additional capacity planning required.

Note that System Recovery Boost Upgrade is not available on z15 T02.

Using System Recovery Boost Upgrade includes terms and conditions for limited use specifically for System Recovery Boost Upgrade.

What benefits can I expect from using System Recovery Boost Upgrade?

When needed for recovery purposes, you can bring this additional zIIP capacity online to your CPC. These zIIPs will then behave just like any other physical zIIP, in that the processors will be shared across the CPC based on their LPAR weights, and additional reserved zIIPs will be able to be brought online at the beginning of a boost due to the additional physical capacity being made available.

Where do these additional zIIP processors come from?

Any zIIP processors you want managed by z/OS as part of System Recovery Boost (i.e., automatically brought on and offline) have to be available to the CPC when the Boost is started. You also must have reserved logical processors defined in the image profile for z/OS to bring online. Physical processors that are made available after the boost has started will not be automatically brought online by z/OS.

How often can I use System Recovery Boost Upgrade?

System Recovery Boost Upgrade is available via a multi-year subscription, with the option to purchase up to five years of subscriptions with [feature code 6799](#). These subscriptions are available in one-year increments.

Upon purchase, 30 activations of System Recovery Boost Upgrade will be available, with the option to automatically replenish these activations via on-line buying during the subscription period.* Recall that each activation lets you unlock up to 20 additional zIIP processors that can be used for up to 6 hours. These additional zIIP processors can also be used in conjunction with one or more of the base functionality zIIP boosts.

**Activation replenishment, during the subscription period, is at IBM discretion.*

How do I order System Recovery Boost Upgrade?

To use System Recovery Boost Upgrade, you must purchase a set of z15 hardware feature codes:

9930: SRB Upgrade Authorization

Drives the necessary contracts to use the SRB Upgrade Record (6802), and is required to enable the ordering of SRB Upgrade Record.

6802: SRB Upgrade Record

Enables temporary activation of additional physical zIIP processors to be used in conjunction with the base functionality. You must have at least one entitled zIIP on the machine to be able to add additional zIIPs via this record (see section below).

6799: SRB Upgrade Years Ordered

Records how many subscription years you purchase for System Recovery Boost Upgrade, with each feature code purchase equating to a one-year subscription. Recall that the multi-year subscription is available in one-year increments of up to five years (i.e., up to five purchases of 6799).

System Recovery Boost Upgrade may be ordered through normal Sales channels, or via the CIU tool on IBM Resource Link[®]. Ordering System Recovery Boost Upgrade through Resource Link requires the ordering of the FC 9900 - on-line buying, and the signing of the on-line buying attachment and its associated supplement.

How many entitled zIIPs do I need to maximize benefit from System Recovery Boost Upgrade?

To provide an example of the different levels of benefit you can expect depending on the number of entitled zIIPs you have available when the boost is started, consider a CPC with 5 shared physical zIIPs and three LPARs, one with 0 initial zIIPs, one with 3 initial zIIPs and one with 5 initial zIIPs.

0 Entitled zIIPs

With 0 initial zIIPs, z/OS won't be able to take advantage of zIIP Boost unless the image has 1 or more reserved zIIPs defined. If there are one or more reserved zIIPs defined, during the boost period, up to 5 reserved zIIPs will be configured online by z/OS, and then configured offline once the boost period is over. If you have a temporary capacity record, then more zIIPs could be configured online during a boost period, up to the maximum allowed by the system definition or the physical number of zIIPs available.

3 Entitled zIIPs

With three initial zIIPs, z/OS will be able to take advantage of zIIP Boost. If one or more reserved zIIPs are defined, up to 2 reserved zIIPs will be configured online by z/OS at the beginning of the boost period, and then configured offline once the boost period is over. If you have a temporary capacity record, then more could be configured online during a boost period, up to the maximum allowed by the activation profile or the physical number of zIIPs available.

5 Entitled zIIPs

With five initial zIIPs, z/OS will be able to take advantage of zIIP Boost. However, unless you have a temporary capacity record, no more zIIPs will be able to be configured online by z/OS at the beginning of a boost period. If you have a temporary capacity record, then more could be configured online during a boost period, up to the maximum allowed by the activation profile or the physical number of zIIPs available.

System Recovery Boost Upgrade Ordering Process: Q&A

Are there advantages of ordering System Recovery Boost Upgrade online?

Ordering of the SRB record via IBM Resource Link has a number of advantages.

- Quicker turnaround. Records ordered from IBM Resource Link can be ready for installation within 15 minutes of ordering the record
- On-line ordering of replenishments - quick turnaround on ordering replenishment records to restore activations on your temporary record
- Optional automatic replenishment of activations. Records ordered on-line are eligible to be renewed automatically. Resource Link will monitor the usage of the SRB record's activations and will stage renewal records to take the activation back to the maximum whenever 50% of the activations have been used.

Is auto-replenishment of records available for records ordered via IBM or BP Sales

If on-line buying is enabled for the machine, even if the record was not purchased on Resource Link, you can enable the record for auto-replenishment.

How long will auto-replenishment go on?

Auto-replenishment will continue until the record expires. IBM does reserve the right to stop auto-replenishment at any time.

Will records purchased on-line automatically renew?

No. Renewals of records are allowed within 90 days of the record expiring. Records may be renewed either through IBM Resource Link or via sales.

What's the best way to take advantage of the System Recovery Boost Upgrade?

We envision that System Recovery Boost Upgrade will primarily be used to "cover" a planned change window during which multiple system images will be IPL'd and provide additional processor capacity for that entire change window.

Clients would activate System Recovery Boost Upgrade before the start of the change window and deactivate it at the conclusion of the change window.

During the change window, as individual images are being shut down and IPL'd, each image will go through its own individual shutdown and startup boost periods and will be able to take advantage of the additional zIIP capacity that the activation of the Boost record provided.

Don't forget that to get the most benefit out of the additional capacity, it's best to add additional standby logical zIIP processors to each z/OS system image that you expect to participate in the Boost process. These images will then automatically bring additional logical zIIP processors online during Boost periods, as needed, to take advantage of the additional physical zIIP capacity present on the machine.

Setup and Exploitation

What operating systems support System Recovery Boost?

System Recovery Boost is supported by z/OS 2.3 & 2.4, z/TPF, z/VM[®] 7.1* and SADMP. See table below for more details.

	z/OS	z/TPF	z/VM	SADMP
Supports:	Speed Boost zIIP Boost GDPS enhancements	Speed Boost	Speed Boost	Speed Boost
Boost durations:	30min for shutdown 60min for startup	30min for shutdown 60min for startup**	30min for shutdown 60min for startup	Duration of the dump, or up to 60min

*Second -level guests of VM (other than z/OS images) will “inherit” the GP Speed Boost from z/VM during these z/VM startup and shutdown periods –applies to second-level TPF, VSE, and potentially Linux images. However, individual startups and shutdowns of guests (in isolation from z/VM image startup and shutdown) are NOT boosted.

** No more than 20min may be spent in the catch-up phase after the system has restarted completely.

What about System Recovery Boost for Linux on Z?

Linux[®] on Z does not directly exploit System Recovery Boost. If running on sub-capacity general purpose processors as a second-level guest of z/VM, a Linux on Z guest would “inherit” the Speed Boost from z/VM, but that would be a very unusual Linux on Z configuration. IFL processors would typically be used.

How do I set up IBM System Recovery Boost?

System Recovery Boost is built-in to the IBM z15 and enabled by default on z/OS, requiring no z15 HW Feature Codes to be activated. For the base functionality (Speed Boost, zIIP Boost and GDPS Enhancements), setup is very simple:

1. Ensure that the OS enablement parameter is set appropriately for all images (z/OS enables by default).
2. If applicable, combine and modify GDPS SYSPLEX script verbs acting against multiple images to exploit GDPS enhancements.
3. Modify shutdown automation to invoke PROC to trigger the shutdown boost process.
4. Consider adjusting the level of parallelism present in startup and shutdown automation scripts.
5. If desired, automate on boost-related console messages.

How do I set up System Recovery Boost Upgrade?

Setting up System Recovery Boost Upgrade requires all the steps from the previous question, as well as the following additional steps:

1. Enable the following z15 HW Feature Codes:
 - a. 6799: SRB Upgrade Years Ordered
 - b. 9930 – SRB Upgrade Authorization
 - c. 6802 – SRB Upgrade Record
2. Define reserved logical zIIPs in the image profile for all images that will use the image activation profile.
3. Consider updating your automation to drive the activation/deactivation of the System Recovery Boost Record around IPL windows.
4. Consider automating changing zIIP weights while System Recovery Boost Record is active to ensure that recovering systems have access to the additional capacity.

5. Consider reviewing the tech doc, which explains how to configure an LPAR for the best performance.
6. Consider using the zPCR tool to determine how many physical zIIPs you want to add to your CPC.

How do I activate/deactivate System Recovery Boost Upgrade?

You can manually activate/deactivate System Recovery Boost Upgrade through the HMC/SE; or customer/GDPS automation activation and deactivation via BCPii.

Once activated, the LPAR shares the extra physical zIIP capacity normally across LPARs during the limited time the Temporary Capacity Record remains activated.

You should deactivate System Recovery Boost Upgrade at the end of the IPL or shutdown actions for which the use of the Temporary Capacity Record is intended to provide a boost. Each activation has a fixed 6-hour time limit.

There is no enforcement for deactivation at the end of any individual system's boost period, especially because the intended use of the record may span multiple IPLs and Shutdowns for multiple images as part of a larger rolling IPL or site switch/DR recovery scenario

If not otherwise deactivated, System Recovery Boost Upgrade will auto-deactivate itself after 6 hours.

Are there any recommended automation considerations when using System Recovery Boost?

Some types of automation you may wish to consider include:

- Activating the System Recovery Boost Upgrade temporary capacity record prior to shutdown, and then deactivating it after the recovery is complete (only applies if System Recovery Boost Upgrade has been purchased).
- Dynamically changing LPAR weights as required during a shutdown or startup boost, to prevent images from losing white space capacity to the boosted image.
- Add the starting of the IEASDBS proc to your existing shutdown automation.
- Changing the level of parallelism present in the workload at startup (e.g. starting middleware regions) and shutdown (e.g. doing orderly shutdown of middleware).
 - Automation may pace/throttle these activities to varying degrees; with Boost, less pacing / more parallelism may be desirable.
- To automate on the new z/OS messages that are issued at start/end of boost periods to take whatever actions are appropriate.
- In order to take full advantage of the GDPS Enhancements capability, scripting changes may be required in your GDPS automation scripts.

IBM System Automation or any ISV vendor automation product can be used to provide these automation capabilities.

How do I operate System Recovery Boost once it's set up?

System Recovery Boost can be controlled via the BOOST= parameter in your IEASYSxx parmlib member on z/OS.

- BOOST=SYSTEM is the default setting. It means that z/OS will take advantage of whatever boost(s) are available to it, given the system configuration.
- BOOST=ZIIP will only allow for zIIP Boost.
- BOOST=SPEED will only allow for Speed Boost.
- BOOST=NONE will disable all types of boosting.

How do I see my boost status?

In order to see your boost status, the new console command 'D IPLINFO,BOOST' will give you information as to the BOOST= setting, but does not tell you if an image is currently in a boost period. There are also indicators on the HMC that can tell you if an image is currently boosting or not; the Image Detail panel will tell you if an image is boosting, and there's a new column in the Systems Management list and Custom Groups list that will indicate if a boost is active, but not which type(s).

How to I control the startup boost?

If you haven't disabled System Recovery Boost in parmlib, Startup boost will automatically be enabled during IPL, and lasts for 1 hour on z/OS. If for some reason you want to stop the startup boost prior to the 1-hour time limit, you can run proc IEABE (IEA Boost End) to do so. IEABE will run very quickly and will immediately stop the boost once it's finished.

How do I control the shutdown boost?

Shutdown boost is controlled by BOOST= in IEASYSxx, just as Startup boost is. So, if you have disabled one or more varieties of System Recovery Boost in IEASYSxx, you won't be able to use it for Shutdown boost either. Shutdown boost will last for 30 minutes on z/OS, or until the system stops. So, if the system stops 15 minutes after the shutdown boost is started via the IEASDBS proc, the remaining 15 minutes doesn't carry over to the following IPL.

Additional Q&A

What is the relationship between IBM System Recovery Boost and Parallel Sysplex?

In a well-exploited Parallel Sysplex environment, when one system is down, much of the business workload can be routed to other active images in the sysplex and continue to run, so there is no real application or business workload outage.

In contrast, in non-sysplex environments, or where clients have single-image workloads that do not exploit sysplex, those workloads may become totally unavailable when the one system hosting them is down.

So Parallel Sysplex clients may naturally see less advantage to System Recovery Boost than non-sysplex clients do. Restoring the system (and thus, the business workload) as quickly as possible is absolutely paramount to a non-sysplex client.

But even in a Parallel Sysplex environment, there is always an advantage to restoring all of the normal capacity and redundancy inherent in the configuration as quickly as possible, and System Recovery Boost accelerates that restoration.

Are there any implications of System Recovery Boost for Tailored Fit Pricing, or any other pricing solutions?

We do not believe so. The boosted general-purpose processor capacity provided by Speed Boost is not generally visible to these pricing methodologies, and any boosted zIIP processor capacity for Processor Capacity Boost does not enter into the software pricing.

Are restarts/recycles of middleware and application regions able to benefit from System Recovery Boost?

No, System Recovery Boost only provides acceleration in the context of a system-level startup or shutdown, not for startups/shutdowns of individual address spaces, regions, etc.

**Tangential effects on other LPARs, such as zIIP work spilling onto general purpose processors due to a shortage of zIIP capacity as a result of System Recovery Boost, were not measured and may impact software license charges.*



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