

System Recovery Boost

*Unleash your capacity to
maximize your availability!*



Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

IBM*
ibm.com*
IBM logo*

* Registered trademarks of IBM Corporation

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library is a Registered Trade Mark of AXELOS Limited.

ITIL is a Registered Trade Mark of AXELOS Limited.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Zowe™, the Zowe™ logo and the Open Mainframe Project™ are trademarks of The Linux Foundation.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

UNIX is a registered trademark of The Open Group in the United States and other countries.

VMware, the VMware logo, VMware Cloud Foundation, VMware Cloud Foundation Service, VMware vCenter Server, and VMware vSphere are registered trademarks or trademarks of VMware, Inc. or its subsidiaries in the United States and/or other jurisdictions.

Other product and service names might be trademarks of IBM or other companies.

Notes:

Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

IBM products are manufactured from new parts or new and used parts. In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply."

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice.

Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products about this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

This information provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g. zIIPs, zAAPs, and IFLs) ("SEs"). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the "Authorized Use Table for IBM Machines" provided at www.ibm.com/systems/support/machine_warranties/machine_code/aut.html ("AUT"). No other workload processing is authorized for execution on an SE. IBM offers SE at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.

Copyright 2021 IBM Corporation

Instant Recovery: Leading the industry in IT resiliency

***Avoid downtime cost
Maintain user productivity***

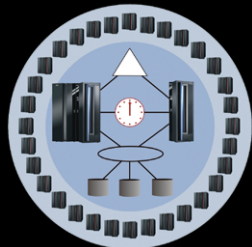
***Ensure access to critical applications
Remain open to clients 24/7***

IBM Z®



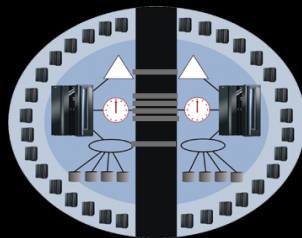
MTBF measured in decades.
Enhanced with IBM System
Recovery Boost.

Parallel Sysplex®



Run a cluster of systems
as one for high availability
and scalability.

GDPS®



An industry-leading solution
for continuous availability and
disaster recovery.

Storage synergy



Integrated by design
to maximize
technology advantages.

IBM z15 solutions are designed to deliver 99.99999% availability¹

Copyright 2021 IBM Corporation
Enterprise Knights Days January 25-28, 2021

Introducing IBM Z Instant Recovery / © 2020 IBM Corporation



1: Disclaimer: IBM Internal data based on measurements and projections was used in calculating the expected value. The z15 servers must be configured in a parallel sysplex using z/OS 2.3 or above; GDPS management of data and middleware recovery across Metro distance systems and storage, including GDPS Metro Multi-site Workload and GDPS Continuous Availability; and DS888X with IBM HyperSwap. Necessary resiliency technology must be enabled, such as System Managed CF Structure Duplexing, Sysplex failure management and Capacity Provisioning Manager. Other configurations may provide different availability characteristics.

IBM System Recovery Boost

Unleash your capacity to maximize your availability

Restore service and recover workloads substantially faster than on previous IBM Z generations, built into IBM z15 with **zero increase in IBM software licensing costs.**

Faster image shutdown and startup

Accelerate the shutdown, restart and recovery of images, middleware environments and client workloads to accelerate return to pre-shutdown SLAs.¹

Faster sysplex recovery activities

Accelerate Parallel Sysplex recovery processes to minimize disruption and expedite return to steady-state operations.²

1. Accelerated shutdown applies only to planned shutdown of z/OS images
2. Sysplex recovery functionality available September 15th, 2020

Faster GDPS automation actions

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

Faster elimination of backlogs

Utilize additional capacity for a fixed period during recovery, so you can work through your backlogs faster after planned or unplanned downtime.



System Recovery Boost Base Functionality

Unleash additional processing capacity using your already-entitled general-purpose processors (GPs) and zIIPs, during a fixed-duration performance increase known as the “boost period.”

- ✓ Faster image shutdown¹ and image startup.
- ✓ Faster middleware and workload restart
- ✓ Faster system recovery and workload execution
- ✓ Faster Parallel Sysplex recovery activities
- ✓ Faster and more parallelized GDPS reconfiguration and orchestration actions.

What's included:

- 30-minute boost for image shutdown
- 60-minute boost for image startup (IPL)
- Up to 30 minutes aggregate per LPAR of recovery process boosts for sysplex recovery, per consecutive 24-hour period²

1. Accelerated shutdown applies only to planned shutdown of z/OS images
2. Each recovery process boost lasts less than 5 minutes

1

Speed Boost

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

Supported by z/OS®, z/TPF, z/VM®, z/VSE & SADMP

2

zIIP Boost

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

Supported by z/OS. Requires defined zIIPs

3

GDPS enhancements

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

Supported by z/OS



System Recovery Boost Upgrade

Maximize performance and parallelism during the boost period

Build upon the SRB base functionality with System Recovery Boost Upgrade, an optional capacity-on-demand offering that lets you **unlock additional zIIP capacity to be used in conjunction with the zIIP boost capability.**¹

Benefits

- ✓ Unlock up to 20 additional zIIP processors for up to 6 hours per activation
- ✓ Additional physical zIIP capacity is shared across LPARs on the machine
- ✓ Use to augment the “base functionality” zIIP boost in one or more images, while the physical capacity remains active on a machine
- ✓ Multi-year subscription of up to five years
 - 30 activations available upon purchase, with the option for automatic replenishment
- ✓ 90-day free trial period available

1. System Recovery Boost Upgrade is only available on z15 T01



System Recovery Boost Upgrade

How to order

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

FC 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, as well as the 90-day free trial.

FC 6802:

SRB Upgrade Record

Enables temporary activation of additional physical zIIP processors to be used in conjunction with the base functionality.

FC 6799:

SRB Upgrade Years Ordered

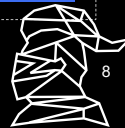
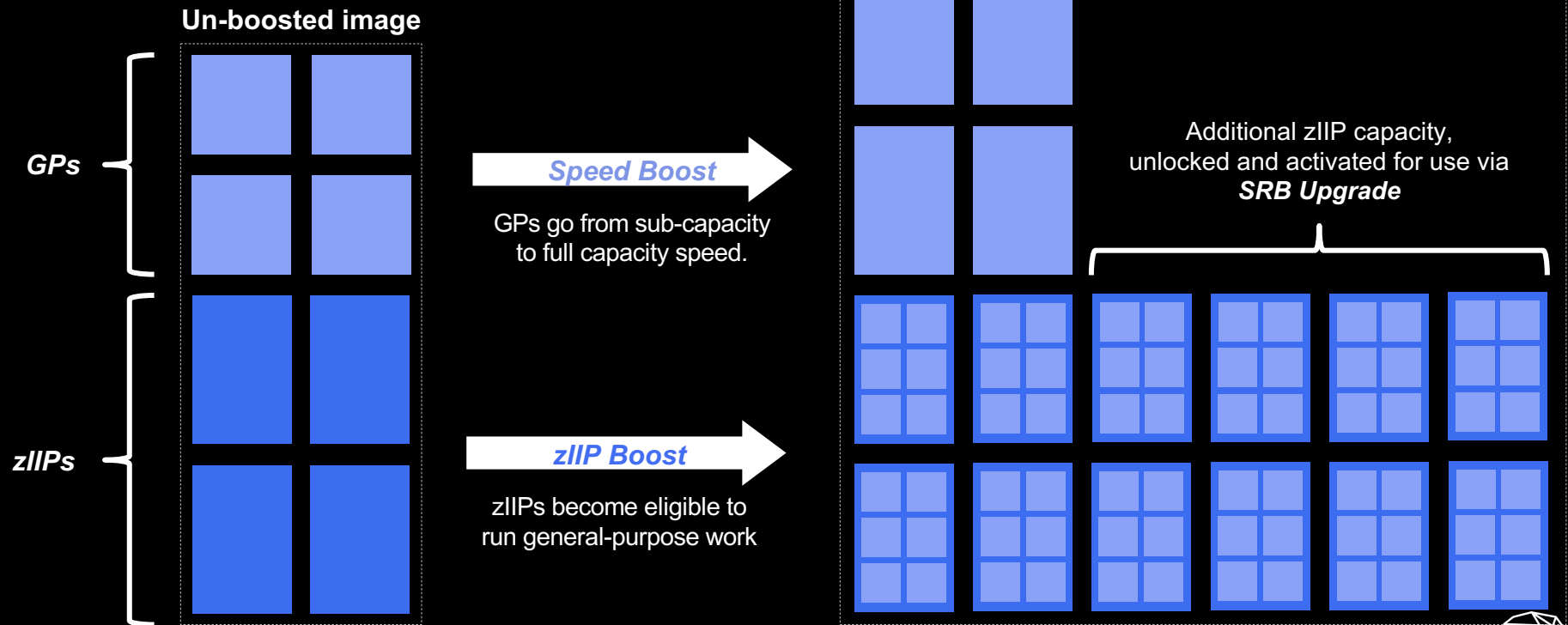
Records how many subscription years you purchase for SRB Upgrade, with each feature code purchase equating to a one-year subscription.

These feature codes can be ordered using the Customer Initiated tool on IBM Resource Link®, or by IBM sales and IBM business partners. Note that you must have one or more entitled zIIPs available in your CPC.



Visualized

Base functionality + System Recovery Boost Upgrade



System Recovery Boost: Beyond the IPL

Sysplex Recovery Process Boosts

System Recovery Boost: Beyond the IPL

It all starts with Parallel Sysplex

IBM Parallel Sysplex technology enables superior scalability, performance, and near-continuous availability by allowing concurrent access to all critical applications and data across multiple z/OS systems.

Parallel Sysplex provides redundancy throughout your environment, so when an outage or disruption occurs, ***your workloads can continue running***.

But... sysplexes still need to recover from failures

When part of a sysplex fails, your workload is still running, but the execution of workload may be delayed while the sysplex is working harder than usual to recover from the failure.

***Now, you have a new way to accelerate sysplex recovery
with System Recovery Boost***



System Recovery Boost: Beyond the IPL

Expedite Parallel Sysplex recovery with new capabilities

System Recovery Boost: Not just for IPLs

Leverage a new class of boost to accelerate sysplex recovery with ***zero increase in IBM software licensing costs.***

Reduce disruption

Expedite return to steady-state operations

Catch-up faster on workload backlog

Recovery Process Boosts

- New short-duration boosts (less than 5 minutes each)
- Use up to 30 minutes (in aggregate) of recovery process boosts per day (per LPAR)
- Can utilize both GP Speed Boost and zIIP Boost capabilities



System Recovery Boost: Beyond the IPL

Sysplex recovery processes explained

Sysplex recovery processes can cause transient workload disruptions...

Sysplex Partitioning

CF structure recovery

CF datasharing member recovery

HyperSwap®

Accelerate processing to recover quickly

Mitigate the effects of extra recovery work for the relevant systems in the Sysplex

Faster processing of backlog for expedited return to steady-state operations

Accelerate sysplex recovery to minimize disruption!



Summary of Requirements

Hardware

- z15 T01 or T02

Firmware

- Base z15 MCL levels – for IPL and Shutdown boosts
- LPAR MCL P46602.005 for z15 Driver 41C (Bundle S29) or higher – for Sysplex Recovery Process boosts

Software

- z/OS 2.4 or 2.3 with PTFs

All APARs for System Recovery Boost are included in the FIXCAT for [IBM.Function.SystemRecoveryBoost](#)



Setup and exploitation

Base Functionality – Setup

Includes Speed Boost, zIIP Boost and GDPS enhancements

- No z15 HW Feature Codes need to be activated
- Ensure that the BOOST= system parameter is set appropriately for all images (z/OS enables by default)
- Modify shutdown automation to invoke IEASDBS PROC to trigger the shutdown boost process
- Consider adjusting the level of parallelism present in startup and shutdown automation scripts
- If applicable, combine and modify GDPS SYSPLEX script verbs acting against multiple images to exploit GDPS enhancements



Setup and exploitation

System Recovery Boost Upgrade – Setup

Same steps involved as the base functionality, PLUS:

- z15 HW Feature Codes for SRB Upgrade:
 - 9930 – SRB Upgrade Authorization, 6802 – SRB Upgrade Record, 6799 – SRB Upgrade Years Ordered
- Define additional reserved logical zIIPs to be brought online for images that will use the additional recovery capacity.
- Consider updating your automation to drive activation/deactivation of the System Recovery Boost Record around shutdown/IPL windows.
- Consider automating changing zIIP weights while System Recovery Boost Record is active to ensure that recovering systems have access to the additional capacity.
- Consider using the zPCR tool to determine how many physical zIIPs you want to add to your CPC.



Learn more about System Recovery Boost

Check out the website

Instant Recovery on IBM z15

Get your critical business applications up and running faster during planned maintenance, site switching or unplanned downtime.

There is no tolerance for downtime

In today's always-on world, customers expect 24/7 service. According to a 2019 ITIC survey, one hour of downtime costs an average of USD 300,000, and one-third of firms surveyed say downtime costs exceed USD 2 million per hour. (1) And while demand for more frequent patches and updates is growing, the window to conduct such maintenance has decreased by 29% in the last two years. (2)

If disaster strikes, your business must recover swiftly. You need to accelerate service delivery, with your backing and support faster to any planned or unplanned event.

[Read the Content page](#) [Meet Your Customers](#)

What is Instant Recovery?

IBM Z® systems are the industry's most dependable infrastructure. Even so, planned or unplanned, downtime can occur.

IBM Instant Recovery is a capability which uses system recovery technologies, available exclusively on the new IBM z15™ System. It minimizes the duration and impact of downtime and accelerates the recovery of your mission-critical applications. Now, you can achieve service level excellence with no increase in MSU consumption or IBM software licensing costs.

[Watch the video \(0:46\)](#)

How our system recovery technologies work

Now you can meet your most stringent service level agreements after outages by unleashing additional zCPI processing capacity during a temporary performance increase known as the boost period.

By enabling general-purpose processors to run at full-capacity speed, and by allowing general-purpose workloads to run on zCPI processors, the boost period accelerates the entire recovery process in the partition(s) being boosted.

50%

Return to your pre-shutdown SLAs in up to 50 percent less time.

2x

Process your transactional backlog by up to 2 times faster.

2.5x

Process your batch backlog by up to 2.5 times faster.

See the content solution

IBM Z System Recovery Boost Content Solution

Welcome to the IBM Z System Recovery Boost content solution, your homepage for technical resources.

With the z15 machines, you have access to System Recovery Boost, which provides capabilities to minimize the impacts of stopping and restarting zOS. System Recovery Boost increases your processor capacity during startup and shutdown, decreasing the time it takes to process backlog. System Recovery Boost can also increase processor capacity to accelerate some ziplines recovery situations.

→ See what System Recovery Boost can do for your business.

Big Picture: System Recovery Boost

1. Startup boost is enabled by default and delivers extra processor capacity after an IPL to get you back up and running faster.
2. Recovery Process boost is automatically invoked to provide increased short-duration processor capacity for the acceleration of some ziplines recovery situations.
3. Shutdown boost enables a faster shutdown by delivering extra processor capacity upon indication that a shutdown is in progress.
4. Update your automation to ensure that System Recovery Boost is optimized for your system, and take advantage of System Recovery Boost upgrades.

How to get started with System Recovery Boost

Speed Boost	zCPI Boost	QDPS
Overview		
Speed Boost is a capability of System Recovery Boost that improves the recovery time of exploding operating systems when running on a subcapacity CPC.		
If you are running on a subcapacity CPC, then while System Recovery Boost is active, zCPI will require that the CPC firmware increase the CP speed of the image to full capacity model speed for the duration of the boost. After the boost ends, the image will return to the subcapacity model speed.		
Speed Boost applies to each of the three boost classes: Startup boost, Recovery Process boost, and Shutdown boost.		
Use the following links to learn more:		
→ Prerequisites		
→ Learn more about Speed boost		
→ Learn about Startup boost		
→ Learn about Recovery Process boost		
→ Learn about Shutdown boost		

Browse the FAQ

IBM System Recovery Boost

Frequently Asked Questions

What is Instant Recovery on IBM Z?

Instant Recovery is a capability that is enabled by a series of technologies, including System Recovery Boost, which is the core enabling technology behind Instant Recovery. Instant Recovery is further enhanced by Parallel Sysplex®, zQIPS®, and core IBM Z hardware functions including logging, repair and upgrade functions for processors, memory, drawers and I/O.

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 unleash additional processing capacity during a temporary performance increase known as the boost period. By enabling general-purpose processors to run at full-capacity speed, and by allowing general-purpose workloads to run on zCPI processors, the boost period accelerates the entire recovery process in the image(s) being boosted. By decreasing the time it takes to shut down, restart and process backlog, System Recovery Boost enables you to optimize your planned maintenance strategy, ensure service-level attainment, and accelerate execution of DR testing and site switch.

How will System Recovery Boost bring value to my organization?

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.

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

Unplanned outage

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

With System Recovery Boost:

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

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:

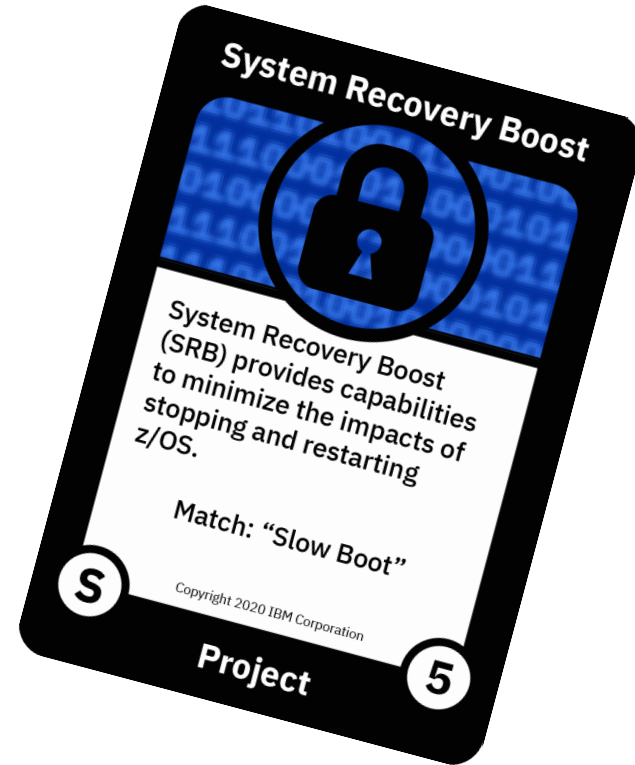
- Perform faster and less disruptive site switches
- Accelerate and simplify DR testing
- Meet DR compliance standards

1 | Page

Contact your sales rep to discover how you can achieve service level excellence with System Recovery Boost



“Collectible Cards”





Thank You!



Additional Information

Technical deep dive

Speed Boost

Enables general-purpose processors on sub-capacity machine models to temporarily run at full-capacity speed in the boosting image(s).

- 60-min IPL boost
- 30-min shutdown boost (IEASDBS PROC)
- Recovery Process boosts

Note that info regarding parmlibs, ENF, SMF apply only to z/OS and are not applicable to other OS's.

Controlled by a z/OS system parameter

- IEASYSxx BOOST=SYSTEM | ZIIP | SPEED | NONE

Applicable **ONLY** to images running on sub-capacity models

z/OS images configured to exploit speed boost will opt-in at IPL time and opt-out at the end of their Boost period

- IEASDBS PROC starts shutdown boost
- Start and End of Boost period starts new SMF interval

While in the Boost period, boosted GP capacity is ignored for all forms of LPAR and OS image and group capping – the GPs appear as if they are *un-boosted*

HMC/SE and z/OS displays show images that are opted-in for the Boost

While in Boost period, LPAR and CEC millicode will work together to dispatch GP processors so that *they will run at full-cap speed, for the Boosted images only ... while GP processors for other un-boosted images continue to run at sub-capacity speed*

While in the Boost period, SMF records used for pricing purposes will contain information about *un-boosted* GP capacity

While in the Boost period, some system performance and capacity indicators show the GP capacity associated with *sub-capacity processors* ... parts of the OS that need to understand “true” capacity will understand that the GPs are running with full-cap capacity and speed

Technical deep dive

zIIP Boost

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

- 60-min IPL boost
- 30-min shutdown boost (IEASDBS PROC)
- Recovery Process boosts

Note that info regarding parmlibs, ENF, SMF apply only to z/OS and are not applicable to other OS's.

HMC/SE and z/OS displays show images that are opted-in for Boost

z/OS images configured to exploit this capability will automatically opt-in at IPL time and opt-out at the end of their Boost period

While in Boost period, each z/OS image sets up its dispatching so that *general-purpose workload is eligible to be dispatched on zIIPs, effectively “blurring” available GP and zIIP capacity together...*

- “Entitled” GPs plus
- “Entitled” zIIPs plus
- Any additional zIIPs provided by the SRB Upgrade temporary capacity record, *if activated*

Controlled by a z/OS system parameter

- IEASYSxx
BOOST=SYSTEM | zIIP | SPEED | NONE

While in the Boost period, boosted zIIP capacity is *ignored* for all forms of image and group capping

If reserved logical zIIPs are available and backed by active physical zIIP processor capacity, images will automatically bring additional logical zIIP processors online to make use of the available physical zIIP capacity during the Boost period

- These additional logical processors are also automatically taken offline at the end of the Boost period

Technical deep dive

GDPS enhancements

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

Note that info regarding parmlibs, ENF, SMF apply only to z/OS and are not applicable to other OS's.

GDPS drives BCPii HW APIs for orchestrating activities such as CBU capacity activations, image activations, resets, and IPLs, for one or more images, in many planned and unplanned DR site-switch scenarios

- There is value in improving both the performance of, and the usage parallelism of, these HW services, in those scenarios

z15 Firmware changes support greater parallelism and performance improvements in the HW API services themselves

Exploitation/usage changes in GDPS software will take greater advantage of the available parallelism in the underlying services

- Implement additional multitasking to drive HW actions in parallel, taking advantage of available cross-CEC parallelism (limited intra-CEC parallelism)
- Avoid redundant per-action or per-system activities in the automation engine
- *Client GDPS scripting changes are required to take full advantage of these enhancements!*



Technical deep dive

GDPS enhancements

GDPS scripting enhancements

Address multiple systems in a single parallel script command:

SYSLEX **<BCPII_Command>** **<System_Criterias>** *Command_Options*

- **<BCPII_Command>** can be:
ACTIVATE, DEACTIVATE, RESET, LOAD, STOP, PSWRESTART
- **<System_Criterias>** can be:
 - List of systems with or without generic names:
SYSTEM (TSYS1, TSYS2, PS*, VM*)
 - Logical Group of systems:
GROUP(SITE1), GROUP(ALL), GROUP(ZOS), etc.
 - Customize group of systems using SYSTEM type, site parms:
GROUP(Type=YV,Site=*) or GROUP(Type=*, Site=*) or GROUP(Type=N,Site=1), etc.
 - Note: A KP, KX, KG, or KR System will never be addressed by a Group criteria

Examples:

- SYSLEX ACTIVATE GROUP(SITE1)
- SYSLEX LOAD GROUP (Type=YN,Site=*)
- SYSLEX RESET SYSTEM(G0C1,G0P*,SVM*)



Technical deep dive

Operating system support

System Recovery Boost is supported by:

z/OS 2.4, z/OS 2.3, z/TPF, z/VM 7.1, z/VSE®, and SADMP

Requires a z15 CPC with installation of required PTFs.

z/OS	z/TPF	z/VM	z/VSE	SADMP
Supports: <ul style="list-style-type: none">• Speed Boost• zIIP Boost• GDPS enhancements.• Sysplex recovery process boosts Boost period: <ul style="list-style-type: none">• 30' for shutdown• 60' for startup	Supports: <ul style="list-style-type: none">• Speed Boost Boost period: <ul style="list-style-type: none">• 30' for shutdown• 60' for startup* <i>*No more than 20' spent in catch-up phase after system has restarted completely.</i>	Supports: <ul style="list-style-type: none">• Speed Boost Boost period: <ul style="list-style-type: none">• 30' for shutdown• 60' for startup <p>z/TPF and z/VSE guests can inherit SRB benefits from the first-level VM system.</p>	Supports: <ul style="list-style-type: none">• Speed Boost• Standalone Dump Boost Boost period: <ul style="list-style-type: none">• 30' for shutdown• 60' for startup	Supports: <ul style="list-style-type: none">• Speed Boost Boost period: <ul style="list-style-type: none">• Duration of the dump, or up to 60'