z/OS 1.11 provided improved resource optimization and economies with the introduction of the capability to run System z Application Assist Processor (zAAP) eligible workloads on System z Integrated Information Processors (zIIPs).

This new support allows an installation to run zIIP and zAAP eligible workloads on installed zIIP processors.

- New capability is ideal for customers without enough zAAP or zIIP eligible workloads to justify a single engine processor. The combined eligible code and enable zIIP workloads might make the acquisition of a zIIP cost effective.
- The new capability is also of value to customers who have only a zIIP processor by making it possible to have J2EE and XML based workloads run on the existing zIIPs.

- The ZAAPZIP support is available on z/OS 1.11 and the support is also provided for z/OS 1.9 and z/OS 1.10 with the linux for z/OS QIAP dumps.

- Note: The supported operations system must be running on any System z980, System z10, System z10, or System z196 server.

System Set-Up:
ZAAPZIP is enabled through the use of a new keyword in the IEASYSxx member of SYS1.PARMLIB. The allowed syntax and defaults differ based on the z/OS release levels:

- z/OS v1.9 and z/OS v1.10
  - YES - zAAP eligible work is able to run on an available zIIP processor when no zAAP processors are present.
  - NO - zAAP eligible work cannot run on an available zIIP processor when no zAAP processors are present.

- z/OS v1.11
  - ZAAPZIP=YES - NO - zAAP eligible work is able to run on an available zIIP processor when no zAAP processors are present.

ZX/OZ YES | NO
z/OS is defined as an alias for ZAAPZIP.

System Requirements:
- Certain hardware configuration requirements must be met in order to use the ZAAPZIP support.
- The support is active only when the following list of conditions are met:
  1. The LPAR must be IPL’d in order for the support to work and all of the conditions must be met.
  2. Later configuration changes to make the hardware condition met are not sufficient.
  3. zAAPZIP=YES is specified or defaulted. Z2 syntax is also acceptable.
  4. There are (or could be, via dynamic CPU addition) zIIPs defined to this LPAR.
  5. No zAAP online.
  6. No online workloads defined in the configuration.
  7. The Global Performance Data Control setting is set for the LPAR.

- NOTE: This allows the given LPAR to determine the absence of zIIPs on the entire processor.

- The ZAAPZIP support does not remove the requirement to purchase and maintain one or more general purpose processors (GCP) for every zAAP processor on the server.

The following information should be understood for each condition:

1. zAAPZIP Specified
   - If there is a mistake in the IEASYSxx specification for ZAAPZIP the IPL will be halted and a WTO issued to allow the operator to correct the specification. See message IEAS41A for more information.
   - In z/OS 1.11 if the operator is going to use the WTO reply to correct the specification error then the keyword ZAAPZIP must be used and not the alias Z2. Specifying the alias Z2 only will be ignored by z/OS when the zIIP Self State is in the parmdef.
   - In earlier releases only the Z2 syntax was supported and can be used to reply to the WTO.

2. zIIP defined to the LPAR (potentially)
   - If a zIIP processor is online to the LPAR and all of the other ZAAPZIP conditions are met then all the previously zAAP eligible workloads will be reported as zIIP time.
   - There is no external method to determine in the zAAPZIP environment how much of the zIIP bus is being used by all the zIIPs on the machine.

3. zAAP online
   - If zAAPZIP is active (defined as being specified in YES in the IEASYSxx member used for the current IPL and all other hardware conditions were met at the time of the IPL), but there is no zIIP processor currently online then the zAAP eligible workloads will still be reported as zIIP eligible and be reported as zIIP time. (aCCPS time in SMP mode.) If a zIIP processor is dynamically added to the LPAR the zAAP eligible workloads will run on the zIIP processor automatically.

4. No zAAPs defined to the LPAR
   - The zAAPZIP support is active only when the following list of conditions are met:
   - The operator must issue a DISPLAY MCHP command in order to know if there are any zAAP eligible workloads online or offline to the LPAR.
   - It is also necessary to know if the LPAR definition panel for the LPAR to ensure the specified fields are set to zero for zAAPs.

5. zAAP configured on the CEC
   - In order for zAAPZIP support to work there cannot be any zAAPs installed on the server. This restriction applies to active OnDemand records which may specify, among other things, a zAAP. In order to permit the zAAPZIP support to work the active OnDemand record would have to be changed to not specify zAAPs and then the record reactivated.

- zm0, on either an IBM z10 Server or a IBM z196 Server, allows the dynamic activation of a zAAP even if the RESERVED field is 0.
- DynApdId must be specified as ENABLE (the default) in LOADcmd. In the situation where ZAAPZIP support is activated on a zAAP processor on an IBM z196 server, if a zAAP processor is dynamically added to the server configuration the ZAAPZIP support will be stopped.

Any zAAP eligible work will no longer be able to run on the zIIP and will instead have to be run by the general purpose CPUs. If the newly configured zAAP is brought online to the zI0S partition the zAAP eligible work will run on the available zAAP.

- NOTE: There is one exception to this requirement and this is for a z/VM environment. For testing purposes it is possible to have a z/VM partition and IPL the z/OS guest which specifies ZAAPZIP=NO and even if the processor has zIIPs installed and being used by other partitions. Of course for the support to work the z/OS guest must still be defined with no zAAP processors.

- A zIIP processor would also be needed in the z/OS guest to actually experience the zAAP eligible work moving to the zIIP. Without a zIIP guest the testing could only verify the IPL process changes.

5. Global Performance Data Control must be set.
   - Global Performance Data Control is an NISMOD parameter which is set on the PR/SM Image Security panel. See the PR/SM Planning Guide, SB10-7151 for more information. Exception for LPARs which require a highly treated environment most environments with this option turned on. This same option is required, for instance, for hyperdispatch support to work in z/OS.

Below is an example of the panel where this option must be set.

Global Performance Data Control
This parameter controls the data that is collected by the Global Performance Data Interface (GPDI) subsystem. The data that is collected can be used by IBM Support to analyze the system performance. This parameter should be set to ON if you want performance data to be collected.

- Global performance data control
- Global performance data control enable (GPE)
- Global performance data control disable (GPD)

No zAAP online
- No zAAP online

**Example - the specification of 3 reserved zAAPs would cause the disablement of the zAAPZIP function.**

The reserved field must be set to 0 to enable the support.