

## Planning for nondisruptive upgrades

Online permanent upgrades, On/Off CoD, CBU, and CPE can be used to upgrade concurrently a z14 ZR1 server. However, certain situations require a disruptive task to enable capacity that was recently added to the system. Some of these situations can be avoided if planning is done. Planning ahead is a key factor for nondisruptive upgrades.

Disruptive upgrades are performed for the following reasons:

- ▶ LPAR memory upgrades when reserved storage was not previously defined are disruptive to image upgrades. z/OS and z/VM support this function.
- ▶ Upgrading from one CPC drawer feature to another (for example, from a Max4 to a Max12) by adding one or more PU SCMs is disruptive. Reasons for such an upgrade might be when:
  - More PU capacity is required
  - More physical memory is required
  - More PCIe Fanouts are required to install an ICA SR card or extra PCIe+ drawer
- ▶ Any installation of physical memory, also within the same CPC drawer feature, is disruptive.
- ▶ An I/O upgrade when the operating system cannot use the dynamic I/O configuration function is disruptive to that partition. Linux, z/VSE, z/TPF, and CFCC do not support dynamic I/O configuration.

You can minimize the need for these outages by carefully planning and reviewing “Guidelines to avoid disruptive upgrades” on page 324.

## Guidelines to avoid disruptive upgrades

Based on the reasons for disruptive upgrades (see “Planning for nondisruptive upgrades” on page 324), you can use the following guidelines to avoid or at least minimize these situations, which increases the chances for nondisruptive upgrades:

- ▶ By using an SE function that is called Logical Processor add (which is under Operational Customization tasks), CPs and zIIPs can be added concurrently to a running partition. The CP and zIIP and initial or reserved number of processors can be changed dynamically.
- ▶ The operating system that runs in the targeted LPAR must support the dynamic addition of resources and to configure processors online. The total number of defined and reserved CPs cannot exceed the number of CPs that are supported by the operating system. z/OS V1R13 with PTFs supports up to 100 processors. z/OS V2R1 and later supports 256 PUs per z/OS LPAR in non-SMT mode and 128 PUs per z/OS LPAR in SMT mode. For both, the PU total is the sum of CPs and zIIPs. z/VM supports up to 64 processors.
- ▶ Configure reserved storage to LPARs.

Configuring reserved storage for all LPARs before their activation enables them to be nondisruptively upgraded. The operating system that is running in the LPAR must configure memory online. The amount of reserved storage can be above the CPC drawer threshold limit, even if no other CPC drawer is already installed. With z14 servers, the current partition storage limit is 4 TB for z/OS V2.3, V2.2, and V2.1. z/VM 6.4 supports 2 TB memory partitions.
- ▶ Consider the plan-ahead memory option.

Use a convenient entry point for memory capacity, and select memory options that allow future upgrades within the memory cards that are installed on the CPC drawer. For more information about the offering, see 2.5.6, “Preplanned memory” on page 45.