IBM

Converting LPAR Weights to Logical Processor Allocation

Redbooks

Abstract

An IBM eServer zSeries or S/390 server can be divided into up to 15 logical partitions (LPARs). Each **LPAR** has its own allocation of system resources (memory, processor, and channels). Resources can be dedicated to an **LPAR** or shared among LPARs. This Tip describes how to calculate the portion of a shared logical processor assigned to an **LPAR**.

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An **LPAR** is granted control of processors based on time slices. Each **LPAR** gets time slices based on the weighting factor for the **LPAR**. For example, consider a system of 12 LPARs sharing seven logical processors. The example configuration is summarized below:

LPAR	Weight	Number of logical processors
A1	180	2
A2	10	2
A3	180	2
A4	10	2
A5	10	4
A6	10	2
A7	10	2
A8	10	2
A9	10	2
A10	10	2
A11	180	2
A12	10	2

To determine the **weight** of each logical processor assigned to the A12 **LPAR**, use the following calculation:

1. **Add up all the LPAR weights.**
   In the example, the sum of all **LPAR weight** is 630: (3 x 180) + (9 x 10) = 630.
2. **Divide the weight of the "interesting LPAR" into the total.**

This is the 'logical share" of the physical complex allocated to the "interesting **LPAR**". In the example, the A12 **LPAR** with a **weight** of 10 is assigned a 1.6% share of the seven shared processors: 10 / 630 = 0.0159.

3. **Divide the number of logical processors for the LPAR into the "logical share".**
   This is the share of each logical processor that is directly relative to the maximum speed that a logical processor will operate if capped. Thus, 1.6% of seven processors is equivalent to about 10% of one processor: 1.6 x 7 = 11.2. Divide this into the two logical processors used by A12 **LPAR**, and each processor would be allocated 5% of one processor.

This calculation is always applicable - even when the **LPAR** runs at less than 100% capacity. If an **LPAR** does not use its allocation, the extra CPU cycles are re-allocated based on existing weights defined to other uncapped LPARs requesting more CPU. However, capped LPARs cannot acquire more CPU cycles than their assigned **weight**, even if those cycles are available.

With dynamic timeslicing, the **LPAR weight** is a *guaranteed minimum*, not a maximum allocation CPU resource. If all LPARs use their allotted share, this would be the amount of processing that could be performed. If the A1-A11 LPARs had little activity, the A12 **LPAR** could get as much as 90% of each logical engine in its assigned time.

Special Notices