



GOOD NEWS!

WHAT IS IT THAT CAN RESTRICT THE INTERACTIVE CAPABILITY ON THE AS/400, iSERIES & SYSTEM i?

Many of our IBM clients who own AS/400 models of the different families of 150/170/270 and 7xx, the iSeries 8xx and the 520/550/570/595 System i line of processors are put "on edge" because of constant decreases in **general performance** when a determined level of **Interactive CPW processor usage** is exceeded (known as the "CPWint Knee"). Unnecessarily, they accept this imposed "Interactive limit" even though they have purchased the hardware and may utilise it to its full potential for all other processing tasks. Alternatively, they can upgrade or purchase additional "Interactive features" to remove this restriction and suffer the additional costs commonly referred to as the "Interactive Tax".

Lest it slip our mind, what is *really* happening is that when the usage of Interactive jobs reach the "Interactive Limit", a (CFINT) job launches automatically and its only mission is to consume significant resources from the processor. The adverse performance effect is indiscriminate on *all* executing jobs ... whatever they are - Batch, Interactive, Transcriptors, Systems, Subsystems, etc. The **erratic behaviour** and **inconsistent performance** caused by the invocation of the CFINT job is bad for your business ... and, unpredictable.

So that one can get a better picture of this and clarify the concepts involved, we show you a technical description of the above situation fully exposed.

INTERACTIVE UTILISATION

When the interactive CPW utilization is beyond the knee of the curve (the "CPWint Knee"), the following formulas can be used to determine the effective interactive utilisation or the available & remaining client server (or Batch) CPW. These equations apply to all models.

CPWcs(maximum) = client/server CPW maximum value
CPWint(maximum) = interactive CPW maximum value
CPWint(knee) = interactive CPW at the knee of the curve
CPWint = interactive CPW of the workload

X is the ratio that says how far into the overhead zone the workload has extended:

$$X = [\text{CPWint} - \text{CPWint}(\text{knee})] / [\text{CPWint}(\text{maximum}) - \text{CPWint}(\text{knee})]$$

EIU = Effective Interactive Utilisation. In other words, the free running **[CPWint(knee)]** interactive plus the combination of interactive and overhead generated by **X**.

$$\text{EIU} = \text{CPWint}(\text{knee}) + X * [\text{CPWcs}(\text{maximum}) - \text{CPWint}(\text{knee})]$$
$$\text{CPW remaining for batch} = \text{CPWcs}(\text{maximum}) - \text{EIU}$$

Example 1:

A model 7xx machine has a Processor CPW of **240** and an Interactive CPW of **70**. The interactive CPU percent at the knee equals (70 CPW / 240 CPW) or **29.2%**. The maximum interactive CPU percent allowed (7/6 of the Interactive CPW) equals (81.7 CPW / 240 CPW) or **34%**.

Now if the interactive CPU is held to less than **29.2%** CPU (the knee), then the CPU available for the System, Batch, and Client Server work is **100%** minus the **Interactive CPU utilised**. However, if the interactive CPU is allowed to grow above the knee, say for example to **32.1 %** (110% of the knee), then the CPU percent remaining for the Batch and System is calculated using the formulas above:

$$X = (32.1 - 29.2) / (34 - 29.2) = .604$$

$$EIU = 29.2 + [.604 * (100 - 29.2)] = 71.9\%$$

$$CPW \text{ remaining for batch} = 100 - 71.9 = 28.1\%$$

Note: that a swing of + or - 1% interactive CPU yields a swing of effective interactive utilization (**EIU**) from 57% to 87%.

Also note that on custom servers and 7xx models, environments that go beyond the interactive knee may experience severe degradation and erratic behaviour.

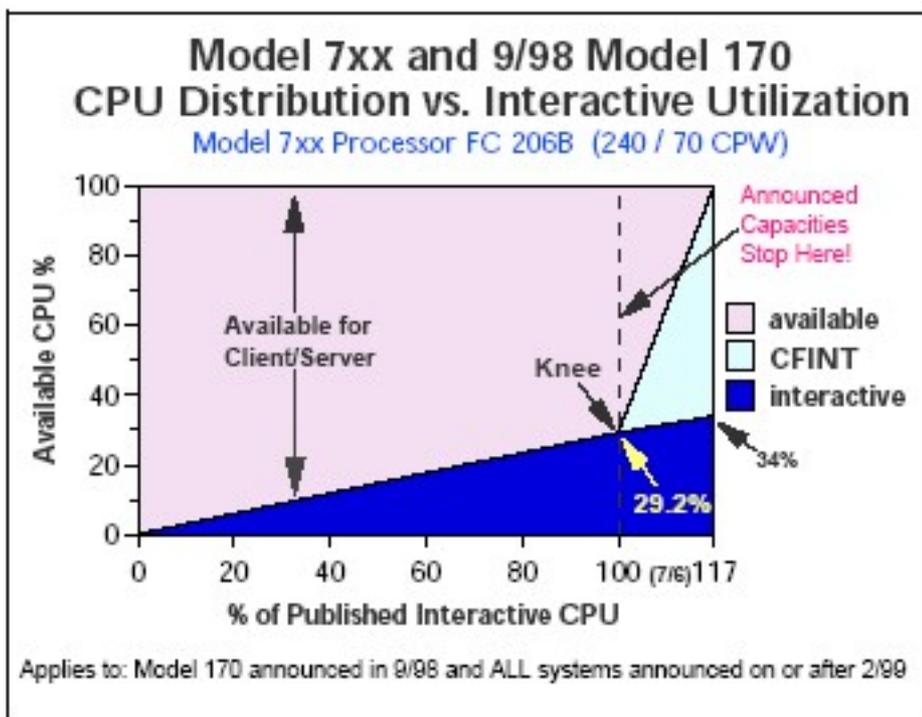


Figure 1: These processors “collapse” when reaching 29.2%

Example 2:

Let’s say another server model has a Client Server CPW of **450** and an Interactive CPW of **50**. The maximum interactive CPU percent equals (50 CPW / 450 CPW) or **11%**. The interactive CPU percent at the knee is 1/3 the maximum interactive value. This would equal **4%**.

Now if the interactive CPU is held to less than 4% CPU (the knee), then the CPU available for the System, Batch, and Client/Server work is **100%** minus the **Interactive CPU utilised**.

If the interactive CPU is allowed to grow above the knee, say for example 9% (or 41 CPW), then the CPU percent remaining for the Batch and System is calculated using the formulas described earlier

$$X = (9 - 4) / (11 - 4) = .71 \text{ (percent into the overhead area)}$$

$$EIU = 4 + (.71 * (100 - 4)) = 72\%$$

$$CPW \text{ remaining for batch} = 100 - 72 = 28\%$$

Note that a swing of + or - 1% interactive CPU yields a swing of effective interactive utilisation (**EIU**) from 58% to 86%. On earlier server models, the dynamics of the interactive workload beyond the knee is not as abrupt, but because there is typically less relative interactive capacity, the overhead can still cause significant inconsistency in response times.

GRAPHICS

Probably, understanding the concepts and formulas “unravelling” above can be hard, but the reality of the “Interactive limit” is without doubt. The graphic shown in Figure 1 above illustrates a very transparent and specific point in the behaviour of Interactive usage related to the other resources. It is important to see that at the point marked as **Knee = 29.2%**, which is the interactive usage at that instant, CFINT launches and ... **consumes and exhausts the rest of the CPU'S capacity**. In other words, almost 70% of the processor resources are **wasted and not usable**.

The graph in Figure 2 below presents a similar scenario for another group of processors, whose interactive **Knee limit is 1/3**. The limit is reached earlier and the progressive decrease of general performance occurs somewhat slower.

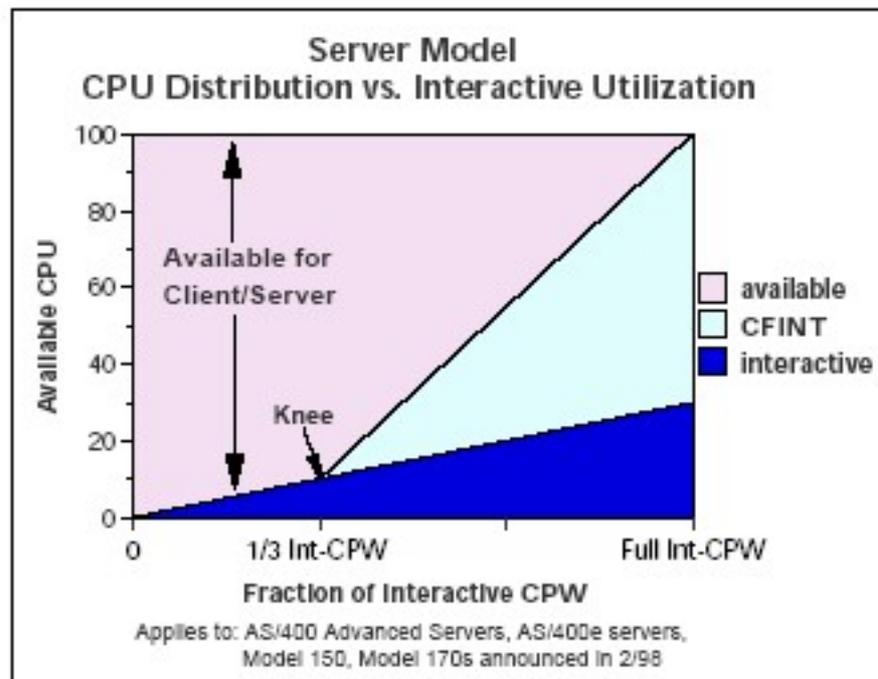


Figure 2: These processors degrade at 1/3 of the interactive

CONCLUSION

When the interactive CPW limit is reached, the rest of your jobs are artificially cramped by CFINT. The solution to avoid the severe degradation caused by the invocation of the CFINT job at the “knee” can be provided by the **GoFaster** software. Its mission consists of effectively “moving the knee” to the ceiling of the total CPW performance. **GoFaster works equally well** on “limited Interactive” models, “zero-rated” models and active processors without the Enterprise-Enablement feature. In this way, the Interactive limit is allowed to equal the total potential of the machine or active processor, irrespective of the model of AS/400, iSeries or System i.

Checking out its efficiency is easy ... “test drive the car for yourself”!! [Ask for a free trial.](#)