
Rule DAS132: LARGE PEND TIME MAY BE CAUSED BY OTHER SYSTEM

Finding: A significant amount of the PEND time delay may have been caused by activity from another system sharing the volume, since the PEND time was not explained by high path activity. (Note that other activity not detectable by CPExpert could have caused high PEND time, so the cause may not be activity by another system.)

Impact: This finding may have a MEDIUM IMPACT or HIGH IMPACT on the performance of the device.

Logic flow: The following rules cause this rule to be invoked:
 DAS100: Volume with the worst overall performance
 DAS130: Major cause of I/O delay was PEND time

Discussion: PEND time is the time from the issuance of the SSCH instruction until the device is selected by the control unit. This time is caused by queuing for the path (wait for channel, wait for control unit or wait for head-of-string), and can be caused by other systems sharing the device (wait for device).

If the large PEND time was not explained by path utilization, CPExpert determines whether the IOCP macros indicated that the device was shared with another system. If the device is shared with another system, large PEND time may indicate contention with the other system.

Suggestion: Large PEND times in shared-device environments usually involve the following situations:

- Multiple data sets may be active on the volume. This situation is the most common and easiest to solve. The data sets can be redistributed among different volumes, to eliminate the queuing at the channel level (reflected as PEND time) for the single volume.

If some of the data sets are not required to be shared, then the Data Base Administrator has complete flexibility to move these data sets (subject, of course, to the performance implications of the target devices). These data sets should be moved to a non-shared device.

If the data sets are required to be shared, then they must be relocated to shared devices.

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- Multiple applications or users may be using the same data set on the volume. Depending upon the data set characteristics, duplicate copies of the data set may be placed on different volumes. This would solve the PEND problems caused by contending systems. If this option is feasible, the data sets could be placed on non-shared devices, likely resulting in even more performance improvement.
 - Multiple application systems may be using the volume experiencing high PEND times. In this case, perhaps application redesign or scheduling can solve the problem.
 - The other system may be issuing a RESERVE command for the device. The applications causing the RESERVE to be issued should be examined to determine whether the RESERVE is required. If the RESERVE **is** required, the above situations should be reviewed to determine whether improvements can be achieved.