Rule DAS231: PEND TIME DELAY WAS CAUSED BY PATHS TO DEVICE

Finding: CPExpert has determined that the excessive PEND time was caused by utilization of the paths to the device.

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:

DAS200: Volume with the worst overall performance
DAS230: 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).

Large PEND times for devices that are not shared may mean that there are insufficient paths available to the device. Too much I/O may be directed to many devices on the path, control unit, or head-of-string. CPExpert computes the path utilization for paths to the device. Rule DAS231 is produced if the path utilization for paths to the device is sufficiently large to cause PEND delays.

Suggestion: High PEND caused by path utilization might be solved by redistributed data sets among different volumes on different paths, control units, or heads-of-string. This will reduce the hardware-level queuing. Alternatively, the entire volume may be moved to a different (less busy) head-of-string or path.

If redistributing the data sets or moving the volume is not feasible, then the device should have more paths. Depending upon the existing configuration, this may involve re-configuring existing channel paths, acquiring additional hardware, or upgrading the controller and device so that DLSE (four concurrent paths) can be installed.

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