

---

**Rule DAS360: Missed cache hits probably were caused by shared DASD conflicts**

---

**Finding:** CPEXpert believes that the missed cache hits performance problems were caused by shared DASD conflicts.

**Impact:** This finding is used to assess whether sharing DASD between systems or MVS images caused performance problems.

**Logic flow:** The following rules cause this rule to be invoked :

- DAS100: Volume with the worst overall performance
- DAS160: Missed cache read hits was major cause of I/O delay
- DAS300: Shared DASD conflicts caused performance problems

**Discussion:** If CPEXpert determines that cache missed read hits was the major cause of I/O response delay and if the device is shared, CPEXpert analyzes other systems in the performance data base which share the volume.

Cache read hits can be caused by another system if the other system reads data from devices attached to the cached controller. If the data required by the other system is not in cache, the data must be brought into the cache to replace data already in the cache. The data being replaced might subsequently be required by the system being analyzed, and thus missed cache read hits would occur.

- If the data required by the other system is already in the cache, the data transfer will be reflected as CONN time by the other system.
- If the data must be brought into the cache, the mechanical time for the device will be reflected in DISC time. This is the time to position the arm (seek time) and to rotate the disk to the proper sector (latency). Rule DAS110 and Rule DAS310 would be produced if CPEXpert estimated that seeking was a problem. Consequently, the residual time examined by Rule DAS360 is the latency delay.

In either of the above situations with cached shared devices, CPEXpert analyzes the amount of I/O operations from System A and System B to the cached controller.

- If System B does **not** generate a relatively large number of I/O operations to the device, CPEXpert concludes that there is **not** a conflict.

- 
- If System B **does** generate a relatively large number of I/O operations to the device, CPEXpert concludes that there **is** a conflict caused by sharing the device. The rationale for these conclusions is the same as was discussed in Rule DAS310 (seeking probably was caused by shared DASD conflicts).

**The standard analysis performed by CPEXpert may not detect a cache problem under two possible scenarios.**

- If only one cached controller is attached to System A, CPEXpert may not detect a problem with the device. This is because the logic employed by CPEXpert selects devices with the most performance improvement within each **type of device** and then selects the **overall** "worst" devices for detailed analysis.

CPEXpert considers cached devices to be a unique type. If all devices on the cached controller received bad service caused by shared cached problems, CPEXpert may not detect a performance problem with the cached devices. This is because all devices in the "device type" could have roughly equal poor service and no device would be **significantly** worse than the other devices in the device type. Consequently, CPEXpert might not select any of the cached devices for detailed analysis

If there are multiple cached controllers, there would be a larger number of "candidate" devices, and the standard analysis performed by CPEXpert is more likely to identify any problem caused by shared cache controllers.

- The analysis performed by CPEXpert may not detect a cache problem if the cache is being replaced with data from another volume. It is possible that System B could cause data from another volume to be loaded into the controller's cache. This volume could be a volume not be flagged as the "worst" performing volume when analyzing performance from the perspective of System A. From System A's perspective, accesses to the worst volume would simply not find required data in cache.

Without analyzing the IOCP information for all systems, CPEXpert cannot determine which volumes are attached to which controllers. Consequently, CPEXpert cannot at present relate (1) poor performance for one volume on System A and (2) I/O operations to a different volume by System B.

If you suspect problems because of shared cached devices, you can direct CPEXpert to analyze the specific devices (using the SELECT option in DASGUIDE). CPEXpert will then analyze only the devices selected.

---

**Suggestion:** You should use the information displayed by Rule DAS300 to assess the significance of the performance problems caused by shared DASD. Please refer to the suggestions associated with Rule DAS300 for alternative actions you may consider.