

Preface

Over the past several decades, computer technology advances have dramatically increased the processing power of central processors. Unfortunately, the improvements in I/O processing have not kept pace with the central processor advances. However, the data storage and accessing requirements of most installations continue to significantly increase as new applications are developed. The "DASD farm" often represents the largest investment in hardware in a large installation, and on-line applications require rapid access to data in order to meet response goals.

A variety of techniques have been implemented in an attempt to minimize the amount of I/O processing or to speed the access to data (dataspaces, virtual storage, expanded storage, and cached DASD are examples of techniques implemented to reduce the I/O requirement or to speed access). These techniques have had limited success in reducing the "I/O bottleneck" for most installations. Consequently, the DASD configuration still presents the largest potential for overall performance improvement and for performance improvement of specific applications. In fact, IBM has stated that *"over 75% of the problems reported to the IBM Washington System Center can be traced to some kind of I/O contention. Channel loading, control unit or device contention, data set placement, paging configurations, and shared DASD are the major culprits..."*¹

We believe that a typical Data Base Administrator can solve the more serious DASD performance problems with such information as:

- Which DASD devices offer the most potential for improved performance.
- Which DASD devices cause the most adverse effect on the performance of specific application systems (such as on-line applications).
- Which applications use these DASD devices and how much the applications use the DASD devices.
- Which applications interfere with on-line workload (such as TSO or CICS), and what is the effect of the interference.

The DASD Component of CPExpert is designed to identify DASD problems such as those listed above, and to provide the information necessary to solve the problems. Data Base Administrators can then focus on correcting the DASD problems identified.

¹MVS Performance Notebook, IBM publication GC28-0886

How to use this manual

This document describes how to use the DASD Component of CPEXpert to analyze major constraints to improved performance of your computer system. The manual is organized into six sections and one appendix.

Section 1 provides an introduction to the DASD Component. This section is organized into four chapters. Most of this section can be reviewed for general information.

- Chapter 1 provides a brief background of DASD performance problems and performance analysis.
- Chapter 2 provides an overview of the DASD Component of CPEXpert.
- Chapter 3 describes the sources of data used by the DASD Component to analyze DASD performance.
- Chapter 4 describes the performance data bases which CPEXpert can use to analyze performance.
- Chapter 5 briefly describes the types of analysis that the DASD Component performs.

Section 2 provides information on installing the DASD Component (please follow the instructions contained in the *CPEXpert Installation Guide* if CPEXpert has not been installed). The instructions in this chapter should be followed closely when installing the DASD Component, and may be required when you make changes to your I/O configuration. This section is organized into three chapters:

- Chapter 1 provides detailed instructions on how to install the modification to MXG necessary to collect information relating DASD use to specific applications (jobs, job steps, and service classes or performance groups). If you use MXG to create your performance data base, the instructions in this chapter will optionally be followed when you initially install the DASD Component.
- Chapter 2 provides detailed instructions on how to install the modification to NeuMICS necessary to collect information relating DASD use to specific applications (jobs, job steps, and service classes or performance groups). If you use NeuMICS to create your performance data base, the instructions in this chapter will optionally be followed when you initially install the DASD Component.
- Chapter 3 provides detailed instructions on how to (1) define workload categories, (2) associate service classes or performance groups with the workload categories, and (3) direct CPEXpert to perform analysis based upon the defined workload

categories. The workload definition is optional; you do not have to define any workloads. However, you must define workloads if you wish CPEXpert to analyze the DASD performance effects of contending workloads.

Section 3 describes how to provide guidance variables to the DASD Component using the CPEXPRT.SOURCE(DASGUIDE) PDS member. The instructions in this section will be important any time the guidance variables need to be changed. This section is organized into two chapters.

- Chapter 1 describes how to specify data selection and presentation guidance variables. The instructions in this chapter will be important if you wish to select specific measurement periods for analysis.
- Chapter 2 describes how to specify analysis control variables to guide the DASD Component in its analysis of system performance. The instructions in this chapter will be important if you wish to alter the defaults provided with the DASD Component.
- Chapter 3 describes how to exclude specific volumes from analysis.
- Chapter 4 describes how to select specific volumes for analysis.
- Chapter 5 describes how to analyze how well critical data sets meet response objectives.
- Chapter 6 describes how to analyze potential performance problems with VSAM data sets.
- Chapter 7 describes how to exclude specific VSAM data sets from analysis.

Section 4 provides information on executing the DASD Component. The instructions in this section should be followed closely when executing the DASD Component. The instructions in this section will be important each time the DASD Component is executed.

Section 5 describes DASD performance considerations. The information in this section should be appreciated before attempting to use the DASD Component. The section is organized into two chapters.

- Chapter 1 provides an overview of DASD performance considerations. This chapter describes the major components involved in a typical DASD I/O operation. The information in this chapter allows you to appreciate the importance of the areas analyzed by the DASD Component.

- Chapter 2 describes limitations and considerations involved in using SMF/RMF data to analyze DASD performance. The information in this chapter is essential in determining whether the analysis performed by the DASD Component is appropriate for your environment.

Section 6 describes how to use the DASD Component to analyze performance. The instructions in this section should be followed each time you execute the DASD Component.

Appendix A contains a detailed description of each rule that results in a finding based upon the DASD Component analyzing performance of your DASD. You may wish to briefly review the rules in this appendix to appreciate the problems that are encountered in different installations. However, it is not necessary to read all of the rules. It is necessary only to read the rules that are identified by the reports produced from the DASCPE Module.

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