To: Distribution

From: Kathleen Vogt Kissel

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Subject: Rewriting/Organizing   the   Multics   Administrators'
           Manuals

Send comments to:

Vogt.MPM @ MIT
Vogt.Pubs @ System M

or

Katie Kissel
Honeywell Information Systems
575 Tech. Sq.
Cambridge, Ma. 02139

or

Mail stop: MA22

or call:

617-492-9324
HVN 261-9324

INTRODUCTION

In a continuing effort to improve Multics documentation, the Multics documentation staff is redesigning the Multics Administrators' Manual set and the Multics Operators' Handbook (MOH). New plans for the MOH are discussed in detail in MTB-544. This MTB specifically addresses the first step in improving the MAM - System.

PROBLEM DEFINITION

Several shortcomings in the MAM and MOH have been identified. Among them are unclear audience identification, poor organization and presentation of material, and difficulty of use.

Audience Identification

An audience that the MAM - System (SAM) currently overburdens with reference material is the type of system administrator who serves as system manager, i.e., he "holds the purse strings" and sets site policy. He does not necessarily want to get his hands dirty. Those who DO get their hands dirty are the system maintainers. System maintainers are system programmers who run the operating system: they analyze dumps, solve user problems, deal with file system crashes, and perform system recovery when the standard procedures don't work. In addition, the system maintainer often serves as system administrator, doing the jobs of creating a Multics environment, controlling resource usage, and providing system security services, following the policies set forth by the system manager. Thus, the system maintainer may be registered on both a maintenance and an administrative project. Individual sites may also delegate specialized administrative tasks; they can designate separate, special identities for the security administrator and for the registration and accounting administrator. Additionally, sites generally have several project administrators whose experience and Multics expertise widely varies.

The MAM set attempts to address some of these different audiences already in its separate manuals for different types of administrators: system, project, registration and accounting, RCP, and communications. The SAM is probably the worst of these in terms of audience targeting and ease of use, partly because of its sheer volume of reference material and partly because of the myriad tasks involved with administering Multics efficiently.

To alleviate these problems, we are proposing a new system managers' manual that will contain some of the information from the SAM and new information aimed specifically at the system

managers. This new manual will concentrate on providing system managers with a concise guide to the options available on the Multics system and the practical information needed to set policies that will tailor their system to the needs of their users. It will describe the various concepts involved with Multics administration, and describe factors that must be considered in making informed decisions. Plans are for the current SAM to remain available for some time, until the complete restructuring described below is completed.

Organization and Presentation of Material

Current plans for the MOH are to develop three manuals from the existing one, in three phases. The first phase is to develop a cookbook manual for operators. The second phase will involve writing a separate cookbook on system operation for system maintainers. In the final phase, the present MOH will be reorganized into a reference for both operators and maintainers. Until that final phase the MOH will be available, essentially as is, for reference.

We also plan to develop three manuals from the SAM, in three phases as above. The first phase is the development of the system managers' manual. The second phase: maintainers (who are currently part of the SAM audience, together with system managers) will get a separate cookbook manual for system administration. In the final phase, the present SAM will be reorganized into a reference manual on system administration for administrators and maintainers. In the future, as resources permit, cookbooks for each presently defined administrative type, i.e., project, registration and accounting, security, RCP, and communications, will be provided. Depending on the size of these final cookbooks, they can either stand alone as separate manuals or be two-part manuals containing both the cookbook and reference material needed by their particular audiences.

Ease of Use

Ease of use is the expected result of the creation of the cookbooks. These cookbooks will describe the steps necessary to perform common, and some not-so-common, tasks. Each task will generally require the use of a number of commands, used in a particular order with certain arguments. Thus, users won't have to flip back and forth through the manual, or manuals, trying to locate all the command information necessary to perform some task, since it will be collected under the description of that task. Reference material will be consolidated, which should also save on manual-flipping. Additionally, we may also be able to produce pocket guides for those who prefer more portable reference manuals.

SUMMARY

Restructuring the MAM set and the MOH should corrct several long-standing problems with these books. That restructuring includes a proliferation of new manuals, but those new manuals also fulfill needs previously unmet by Multics documentation.

The two manuals adjudged in most need of improvement are the SAM and MOH. Below is a chart of the proposed plan for each of them.

	=>	*System Managers' Guide
SAM	=>	Maintainers' Cookbook - System Administration
	=>	Administrators' and Maintainers' Reference
	=>	*Operators' Cookbook
MOH	=>	Maintainers' Cookbook - System Operation
	=>	Operators' and Maintainers' Reference

The starred manuals above will be the first to be written. Two writers are currently assigned to the project, which will be carried out in several steps.

APPENDIX A

This appendix presents a tentative outline for the Multics System Managers' Guide (MSMG). The Guide will focus on system administrative options, but may also include other technical topics of interest to the system managers. Suggestions for other topics are welcome.

MULTICS SYSTEM MANAGERS' GUIDE

Introduction

How to use this guide

Definition of system manager and responsibilities

Definition of areas of the system requiring administration:
    system, security, accounting, projects, maintenance, machine operation, I/O daemon (bulk I/O), RCP, communications (with pointers to appropriate manuals)

Definitions of personnel to whom authority can be delegated:
    maintainers (system programmers) (SysAdmin and SysMaint), accounting and registration administrator (limited environment), security administrator

Configuration

Hardware - brief definitions:
    CPU, IOM, FNP, SCU, Main Memory
    Terminals
    Printers/punches/readers
    Disk/tape drives

Considerations:
    Number of operators needed
    Number of tapes/disks, etc.
    Paper and tape storage
    Power
    Wiring and communications lines
    Air conditioning
    Physical security and machine room access

Software - brief definitions:
    Physical volume, logical volume, organization of disk storage (e.g., root and public logical volumes, private logical volumes)
    Master directories
    Registration record of a logical volume
    Storage quota

Considerations:
    Volume management - logical volumes, paging volumes

Directory Structure and Daemons - System Hierarchy

SysDaemons - brief definitions:
    Backup, Dumper, GCOS, Initializer, IO, Repair, Retriever, Ring_1_Repair,
    Salvager, Utility

Daemons - brief definitions:
    Card_Input, Metering, Volume_Dumper, Volume_Reloader, Volume_Retriever

Directories under the Root - illustration and very brief descriptions:
    >system_control_1   contains site parameters (installation parameters)
    used in defining:
        system shifts
        prices for use of system resources
        CPU/memory configurations
    contains message_of_the_day, Person Name Table
    contains system logs:
        system control log
        perm_syserr_log
        iolog
    contains Master Group Table
        load units and Load Control Group
        work class and percentages
    contains System Administration Table
        registered project entries
    contains Project Definition Tables
        project users and attributes

    >udd>SysAdmin
        >admin   is working dir for accounting administrators, contains
        backup files, bills and statisitcal reports

        >lib   contains administrative tools

    >daemon_did_dir
        >cards >gcos >io_daemon_dir >volume_retriever

Customizing the Environment - Installation Parameters

Installation Parameters: Purpose, Definition, Special Considerations
    Site identification

    Login and Logout: login_time, inactive_time, warning_time, acct_update,
    tries

    Pricing: CPU time, connect time, memory usage, terminal I/O operations
    other resource usage
    Suggestions for figuring cost

Absentee Parameters: number and default values of queues

Device Tables

Shifts and Shift Table

AIM Information

Error Logs

ARPANet

Configuration Table

RCP Flags

Other Parameters

Project and User Registration

Project Registration - What it entails
    PDT and SAT - brief discussions
    "Delegation" to Project Administrator
    Information required for accounting purposes

User Registration - What it entails
    URF and PNT - brief discussions
    Information required for accounting purposes

Special User Identities

System Usage Load Control

Master Group Table - Definition and purpose
    Load Control Groups
        Definition
        Primary and secondary users
        Preemption and grace
        Considerations for setting up load control groups

    Work Classes
        Definition
        How to tune

    Absentee Usage
        Interactive vs. absentee usage
        Absentee usage quotas

    Queues

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Shifts
        Shift change exec_com

    Unattended Service

Security

Physical Security

Internal Access Controls
    Passwords

    Terminal Identification Codes

    Nondiscretionary Access Controls
        AIM

    Discretionary Access Controls
        ACLs, ACSs

    Intraprocess Access Controls
        Rings

    Auditing and Logging

    Accounting Cross-checks

Accounting

Setting Rates - recap
    Interactive - CPU time, real time, memory units

    Absentee - CPU time, memory units

    I/O Device Usage

    Disk Storage

    Registration Fee

    Resource Prices

    I/O Daemon Rates - resource price per queue/request pair

    Terminal Connect Rates

    Miscellaneous Charges

Accounting Update
    Definition and Timing

Disk Report
      Definition and Timing Considerations

Crank
      Definition and Timing Considerations

Billing
      Description and Timing, Storage Requirements, User Load

      Reports - brief descriptions
            MSUM
            Short Bill and Long Bill
            Daily Sumry
            Cutrpt
            Black and White
            Disk Usage

Resource Management

RCP - Definition

Resource Registration
      RTMF, RTDT

Resource Acquisition

Communications

Multics CS - Brief definition
      FNP for Channel Management
      User-ring and Supervisor for Terminal Management

Channel Types
      CDT, CMF - Descriptions, defaults, and considerations

Terminal Types
      TTT, TTF - Descriptions

Metering

Purposes:
      How users are using system
      What actions are occurring most often
      Pinpoints areas requiring tuning and where performance gains can be made

Some Helpful Metering Commands - brief discussion of kinds of info available
      Answering Service (as_who)
      Disk Usage/Config Deck (disk_usage_report, print_config_deck)
      RCP (meter_rcp)
      System Performance (system_performance_graph)

Using the Dump-printing and Metering Daemons

Modifying the System Message Table

Generating Alternative FNP Core Image