IBM 2007 IMPACT

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CICS Performance Analyzer for z/OS A Technical Introduction

Chris Baker
CICS Development

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Presentation Overview

- CICS PA Overview
- CICS PA Benefits
- CICS PA Dialog ...
  - Defining your CICS Systems, DB2 Subsystems, ...
  - Requesting Reports and Extracts
  - Tailoring ...
    - Report Forms, Selection Criteria, Object Lists, ...
- CICS PA Reports and Extracts
- CICS PA Historical Database
- CICS PA Online Statistics Reporting
- Summary

What is CICS PA ?

- CICS Performance Analyzer for z/OS
  - Comprehensive Performance Reporting and Analysis for CICS
  - CICS Monitoring Facility (CMF) data (SMF 110)
    - Performance, Resource and Exception
  - CICS Statistics and CICS Server Statistics data (SMF 110)
  - DB2 Accounting records (SMF 101)
  - WebSphere MQ Accounting records (SMF 116)
  - OMEGAMON XE for CICS records (SMF 112)
  - z/OS System Logger records (SMF 88)
- Program Product – 5697-N40
- Complements …
  - Tivoli OMEGAMON XE for CICS on z/OS V4.1.0
  - Standard CICS utilities – such as DFHSTUP and DFH0STAT

CICS PA Benefits

- Ease of use ...
  - No additional setup or customization required
  - Familiar CICS terms and concepts
- ISPF Dialog to build, maintain, submit reports
  - Tailor your reports easily using Report Forms
  - Extensive online help available, field descriptions, ...
- Extensive Tabular Reports and Graph Reports
  - List, List Extended, Summary, Wait Analysis, Cross-System, ...
  - Resource Usage, DB2, WebSphere MQ, z/OS System Logger
- Extract Data Sets
  - Cross-System Work, Export, Record Selection, System Logger
- Historical Database Capability
  - Trending, Capacity Planning, and Accounting
- Online Statistics Reporting Capability

CICS PA Benefits …

- CICS PA can help ...
  - Analyze CICS application performance
  - Improve CICS resource usage
  - Evaluate the effects of CICS system tuning efforts
  - Improve transaction response time
  - Provide ongoing system management and measurement reports
  - Increase availability of resources
  - Increase the productivity of system and application programmers
  - Provide awareness of usage trends
    - Assisting future growth estimates

CICS PA Benefits – Notes …

CICS PA reports on all aspects of your CICS system activity and resource usage. You can use the CICS PA Interactive System Productivity Facility (ISPF) dialog to generate your report and extract requests. The dialog assists you in building the reports and extracts specific to your requirements without you having to understand the complexity of the CICS Monitoring Facility (CMF) data, CICS Statistics, CICS Server Statistics, OMEGAMON XE for CICS data, and the DB2 and WebSphere MQ Accounting data.

CICS PA provides a comprehensive suite of reports and data extracts for use by:-

- System Programmers - to track overall CICS system performance, evaluate the effects of CICS system tuning efforts.
- Applications Programmers - to analyze the performance of their applications and the resources they use.
- DBAs - to analyze the usage and performance of CICS Resource Managers, such as WebSphere MQ and IP CICS Sockets, and database systems such as DB2 and IMS (DBCTL).
- Managers - to ensure transactions are meeting their required Service Levels and measure trends to help plan future requirements and strategies.

CICS PA Reports and Extracts

- CICS PA reports and data extracts analyze all aspects of your CICS systems, including ...
  - CICS application performance
  - CICS system resource usage
  - Cross-System performance ...
    - including MRO, ISC, IPIC and DB2 Subsystems
  - Transaction Resource Usage
    - File and Tsqueue resource usage
  - External Subsystems used by your CICS applications ...
    - including WebSphere MQ, DB2, DBCTL, and IP CICS Sockets
  - z/OS Workload Manager (WLM)
  - CICS Business Transaction Services (BTS)
  - Transaction Groups …
    - CICS Web Support, ECI over TCP/IP, IIOP, …

CICS PA Reports and Extracts – Notes

The flexibility of CICS PA allows you to easily tailor your report and extract requests to meet your specific performance reporting and analysis requirements. CICS PA allows you to keep pace with the ever-changing nature of CICS by providing a flexible and easy to use dialog that allows you to report on all aspects of your CICS system's performance.

CICS Transaction Server for z/OS Version 3.2 collects over 307 specific performance data fields in 19 groups. Also, if the monitoring MCT options APPLNAME=YES and RMI=YES are specified, then an additional 10 performance data fields in 2 groups are collected. And, if used, DBCTL adds a further 32 specialized fields and IP CICS Sockets adds a further 40 specialized fields. With the advent of CICS Transaction Server Version 3.2, the number of groups and data fields within existing groups continues to grow.

CICS PA can process CMF data from a single CICS system, or from multiple CICS systems that share the transaction workload by using MRO, ISC, or IPIC. Using the **Cross-System report** provides a consolidated report showing the complete transaction activity across connected CICS systems.

The **Transaction Resource Usage reports** provide a detailed analysis of the Resource class records collected by the CICS Monitoring Facility (CMF).

The **Workload Activity report** provides a detailed and/or summary report highlighting the MVS Workload Manager (WLM) Service Class and Report Class, and reporting phase for each transaction.

The CICS **Business Transaction Services (BTS) report** is a detailed report that shows the correlation of the transactions performed by the same or different CICS systems on behalf of a single CICS Business Transaction Services (BTS) process.

CICS PA Reports and Extracts …

- CICS PA reports and data extracts analyze all aspects of your CICS systems, including ...
  - Exception events that cause performance degradation
    - File or LSRPOOL string and buffer waits, CICS storage waits, …
  - DB2 reports using DB2 Accounting records
    - List, Short Summary, Long Summary, ...
  - MQ reports using WebSphere MQ Accounting records
    - List, Summary, ...
  - OMEGAMON reports using OMEGAMON XE for CICS records
    - List, Summary (by Transaction or by Database), …
  - System Logger reports using z/OS System Logger records
    - List, Logstream Summary, Structure Summary, ...

CICS PA Reports and Extracts – Notes

For the **DB2 reports**, CICS PA processes CICS CMF (SMF 110) performance class records and DB2 Accounting (SMF 101) records to produce detail and/or summary reports of the DB2 usage by your CICS systems. The DB2 List report shows the DB2 activity of each transaction and the DB2 Summary report (Short or Long) summarizes the DB2 activity by transaction and program within APPLID. The information provided in the CICS PA DB2 Reports can be used to assist in further analysis using DB2 performance reporting tools such as IBM DB2 Performance Expert (DB2 PE).

For the **WebSphere MQ reports**, CICS PA processes WebSphere MQ Accounting (SMF 116) records to produce detail and/or summary reports of the MQ usage by your CICS systems. The MQ List reports provide a detailed analysis of the comprehensive data contained in the Class 1 (Subtype 0) and Class 3 (Subtypes 1 and 2) accounting records. The MQ Summary reports provide, summarized by either CICS Transaction ID and/or MQ queue name, an analysis of the MQ system and queue resources used and the transactions they service.

For the **OMEGAMON reports**, CICS PA processes OMEGAMON XE for CICS (SMF 112) records to produce detail and/or summary reports on the usage by your CICS systems of third-party database systems monitored by OMEGAMON.

For the **System Logger reports**, CICS PA processes z/OS System Logger (SMF 88) records to provide information on the z/OS System Logger logstreams and coupling facility structures that are used by CICS Transaction Server for logging, recovery and backout operations. These reports, when used in conjunction with the CICS Logger reports produced by the standard CICS statistics reporting utilities, provide a comprehensive analysis of the logstream activity for all your CICS systems and provide a more extensive and flexible performance reporting solution than the IXGRPT1 sample program.

CICS PA Reports and Extracts …

- CICS PA reports and data extracts analyze all aspects of your CICS systems, including ...
  - Performance Data Extracts ...
    - Cross-System Work
      - Provides a complete view of a transaction's CICS resource usage
    - Export (Detail or Summary)
      - Import performance data into PC Spreadsheet and Database Tools
    - Record Selection Extract ...
      - Creates a new SMF Data Set - data volume reduction
        - CICS SMF 110 CMF and CICS Statistics Records
        - DB2 SMF 101 and WebSphere MQ SMF 116 Accounting Records
        - OMEGAMON XE for CICS SMF 112 Records
        - z/OS System Logger SMF 88 Records
    - System Logger
      - List type Extract (SMF 88 Record Subtype 1 only)
        - Import data into PC Spreadsheet and Database Tools

CICS PA Reports and Extracts – Notes

The **Cross-System Work Extract** combines the CMF performance class records belonging to the same network unit-of-work into a single CMF record in order to provide a complete view of a transaction's CICS resource usage. The Cross-System Work Extract can then be used as input to other CICS PA reports or extracts for further analysis.

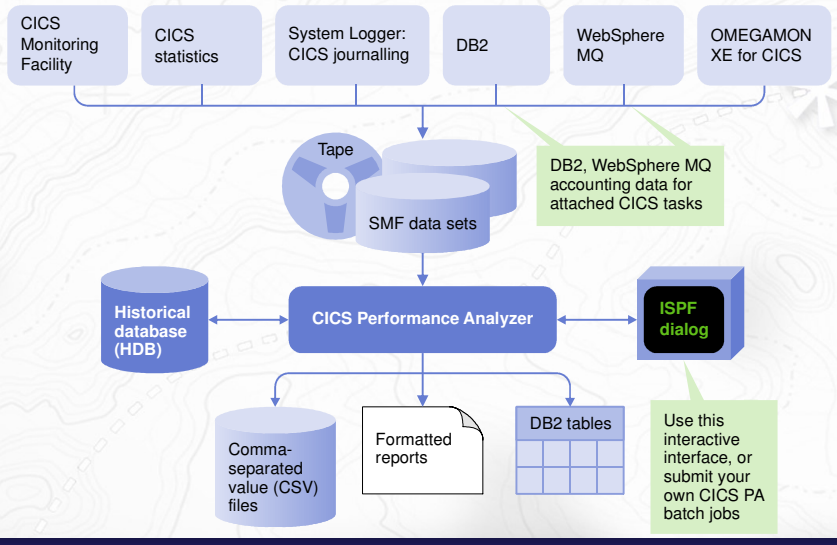
The **Export Data Extract** is a performance data extract formatted as a delimited text file which can be then imported into PC spreadsheet or database tools for further processing and analysis. Detail and/or Summary Data Extracts can be created and the record format can be tailored using Report Forms to include information to meet your specific reporting and analysis requirements.

The **Record Selection Extract** is a facility that allows you to create a smaller extract file containing only the CICS SMF (and optionally DB2 Accounting, WebSphere MQ Accounting, and OMEGAMON) records that are of interest to you. The Record Selection Extract filters large SMF files, that can then be used as input to CICS PA, allowing more efficient reporting and analysis.

The **HDB Load** provides a facility that loads SMF data into a Historical Database (HDB). This same facility is available from Primary Menu option 5 Historical Database. However, from Report Sets you have the advantages of allowing you to run your reports, extracts and produce historical performance and statistics data in one job and also in a single pass of the SMF input file.

The **System Logger Extract** is a facility that allows you to create a data extract formatted as a delimited text file which can then be imported into PC spreadsheet or database tools for further processing and analysis. Selection criteria is also available which can be used to help identify poorly performing logstreams more easily.

CICS PA Overview



CICS PA Overview - Notes

The CICS PA analysis programs use the performance and accounting data written to MVS System Management Facility (SMF) data sets. This includes the data collected by the CICS Monitoring Facility (CMF), CICS Statistics, and CICS Server Statistics written as SMF type 110 records, DB2 Accounting data written as SMF type 101 records, WebSphere MQ Accounting data written as SMF type 116 records, the z/OS System Logger data written as SMF type 88 records, and the OMEGAMON XE for CICS data written as SMF type 112 records.

You can produce all the CICS PA reports and extracts by simply defining your CICS Systems (APPLIDs), MVS Images, DB2 Subsystems, MQ Subsystems (WebSphere MQ Queue Managers), and z/OS System Logger along with their associated unloaded SMF data sets.

Other CICS PA data sets include:-

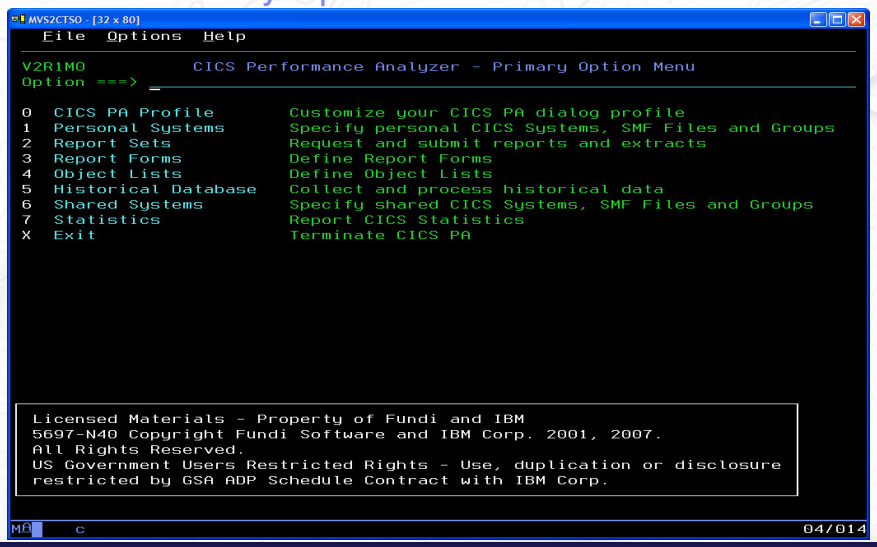
- Report Sets define your report and data extract requests.
- Report Forms enable you to tailor your reports and extracts to include the information that you want to see.
- Object Lists enable you to group objects for reporting purposes, e.g. Analyze the resource usage of a particular group of transactions or users.
- HDB Register is the inventory of all information associated with the CICS PA Historical Database Manager.

More on the CICS PA data sets later in the presentation.

CICS PA – ISPF Dialog

- CICS PA Primary Option Menu ...
  - CICS PA Profile and Settings, CICS PA Data Sets, ...
  - System Definitions - Personal Systems, Shared Systems
  - Report Sets
    - Specify the reports and extracts
    - Specify the record selection criteria (optional)
    - Submit Report Sets
  - Report Forms
    - Tailor the report format and content (optional)
  - Object Lists
    - Enable record selection by a group of objects (fields)
  - Historical Database
    - Definition and maintenance of Historical Databases (HDBs)
    - Submit HDB load and report requests, Export HDB data sets to DB2
  - Statistics - Online Statistics Reporting

CICS PA Primary Option Menu …



CICS PA Primary Option Menu - Notes

The CICS PA Interactive System Productivity Facility (ISPF) dialog allows you to request and submit your report and data extract requests easily. For the more experienced user, a batch command interface is also available to request the reports and extracts.

Follow the dialog to meet your reporting and analysis requirements:-

1. Customize your CICS PA dialog profile (optional). CICS PA will use default settings and prompt you to allocate data sets (with default allocation attributes) when required.
2. Define your CICS Systems (APPLIDs), MVS Images, DB2 Subsystems, MQ Subsystems (WebSphere MQ Queue Managers), z/OS System Logger and their associated unloaded SMF data sets.
3. Report Sets define your report and data extract requests. Here you request and tailor the required reports and extracts, then submit them for batch processing.
4. Report Forms enable you to tailor your reports and extracts to include the information that you want to see. You simply edit the report or extract format and content to meet your specific requirements. Comprehensive online help is available for every CMF field, so you never need to reference a manual.
5. Object Lists enable you to group objects for reporting purposes, e.g. Analyze the resource usage of a particular group of transactions or users.
6. Historical Database enables you to collect, process and manage historical performance and statistics data for your CICS systems.
7. Report CICS Statistics provides comprehensive online reporting of CICS Statistics, either directly from an unloaded SMF data set or from a CICS PA Historical Database.

CICS PA System Definitions

- CICS PA Personal System Definitions ...
  - CICS Systems (APPLIDs)
  - MVS Images
  - DB2 Subsystems
  - MQ Subsystems (WebSphere MQ Queue Managers)
  - z/OS System Logger
  - SMF File Management
  - Maintain Group definitions
  - Definition Take-Up from SMF File
    - Extract System Definitions from an SMF data set

CICS PA System Definitions – Notes

You define your CICS Systems (APPLIDs), MVS Images, DB2 Subsystems, MQ Subsystems (WebSphere MQ Queue Managers), and z/OS System Loggers to CICS PA so that:-

- they can be requested for report and data extract processing
- the SMF files containing the data can be defined.

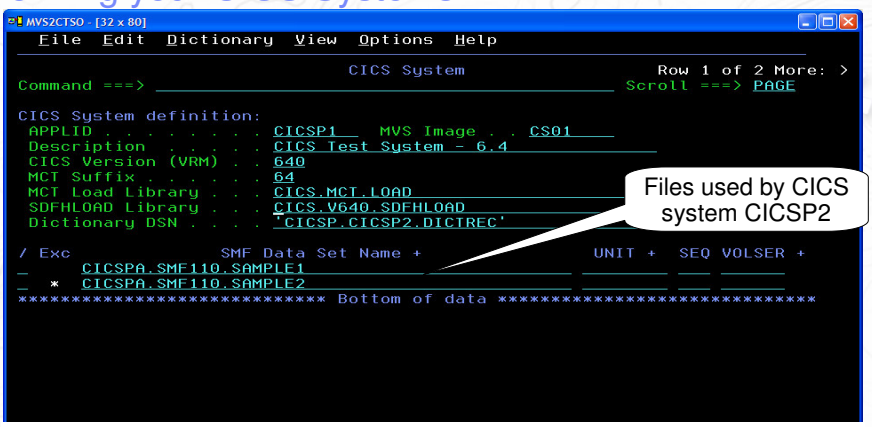
You can specify SMF data sets for each System (CICS, DB2, MQ, Logger) and/or for each MVS System (Image) where they execute.

In addition, each CICS System can belong to one or more Groups. This allows you to easily use CICS PA to "connect" CICS Systems (APPLIDs) that are connected using MRO or APPC and also to their DB2 Subsystems, MQ Subsystems (WebSphere MQ Queue Managers), and z/OS System Logger for reporting purposes. CICS PA Reports and Extracts can be requested for:-

- All CICS Systems (APPLIDs) that are defined to CICS PA
- Selected CICS Systems (APPLIDs)
- CICS Systems (APPLIDs) belonging to a particular MVS Image
- CICS Systems (APPLIDs) belonging to a Group, in order to create consolidated reports, e.g. a group of related regions using MRO or a particular DB2 Subsystem or MQ Subsystem.
- DB2 Subsystem or MQ Subsystem (WebSphere MQ Queue Manager)
- z/OS System Logger.

The main purpose of this panel and the other related panels is to connect the input SMF data sets to CICS Systems, MVS Images, DB2 Subsystems, MQ Subsystems, and z/OS System Loggers.

Defining your CICS Systems



- You need only define the APPLID to start reporting
- All other fields are optional, but ...
  - Specify the MVS Image in order to simplify the SMF file definition

Defining your CICS Systems – Notes

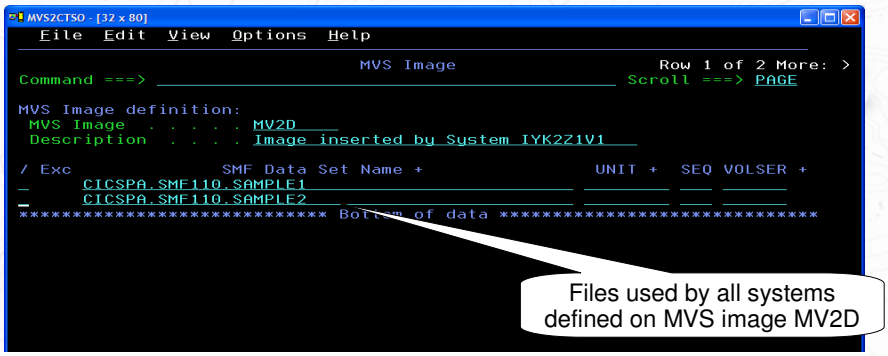
You define your CICS Systems generic **APPLID** here to prepare it for report and extract processing. You need only define the APPLID to start reporting. All other fields are optional. Specify an **MVS Image** to define which system the CICS System (APPLID) belongs to. This enables you to:-

- Request reporting by MVS Image - CICS Systems (APPLIDs) belonging to that MVS Image are selected
- Define SMF files to the MVS Image so that you need only define your SMF files once - CICS Systems (APPLIDs) on this MVS Image can share SMF files.

Specify the **MCT Suffix** to include your CMF User Fields.
Build a **Dictionary DSN** to contain the CMF dictionary record for those times when the SMF file does not contain one, so that reporting can start immediately. CICS CMF uses a dictionary record to "map" the CMF performance class records. CICS writes a dictionary record when the CICS Monitoring Facility starts, but not when SMF switches data sets. CICS PA only needs a dictionary record if you wish to include your CMF User Fields (from user defined EMPs in the MCT) in your reports and extracts. Otherwise, CICS PA uses the default dictionary record for the version of CICS you are reporting.

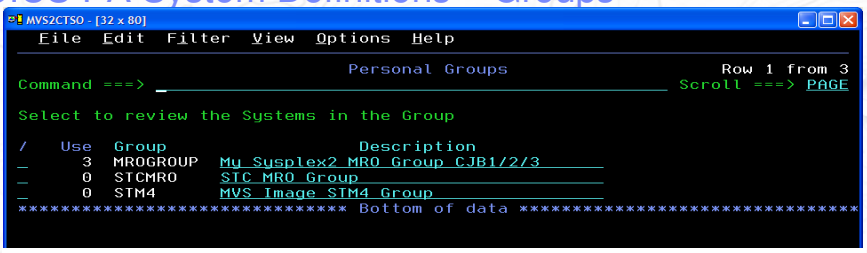
You can specify **SMF Files** that are used by this CICS system. Specific SMF data sets can be Excluded which means they will not be used in reporting. You can also specify the **Groups** that this CICS System belongs to (scroll Right). Define MRO or ISC connected regions to the same Group. When you request reporting by Group, all CICS systems belonging to the same Group are selected for consolidated (i.e. Cross-System) reporting.

Defining your MVS Images



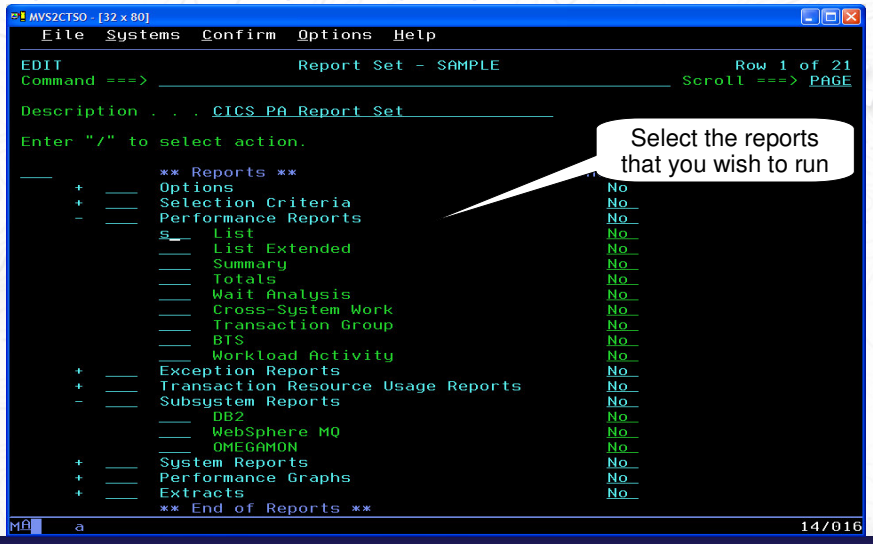
- Report on all Systems on an MVS Image
  - Define SMF data sets to the MVS Image ...
  - All Systems on the image will use these SMF data sets
    - Specific SMF data sets can be Excluded
  - You can also specify SMF data sets for each specific System

CICS PA System Definitions – Groups



- Display and/or Update the Systems in a Group
  - Used to relate a group of systems for reporting purposes
    - MRO regions (TOR, AOR, etc) and the DB2 Subsystem(s) or WebSphere MQ Queue Manager(s) they use
  - Request reporting by Group ...
    - CICS Systems (APPLIDs), DB2 Subsystems, and WebSphere MQ Queue Managers belonging to that Group can be selected for consolidated (i.e. Cross-System Work, DB2 List, DB2 Summary, MQ List or MQ Summary) reporting

Report Sets – Requesting Reports and Extracts …



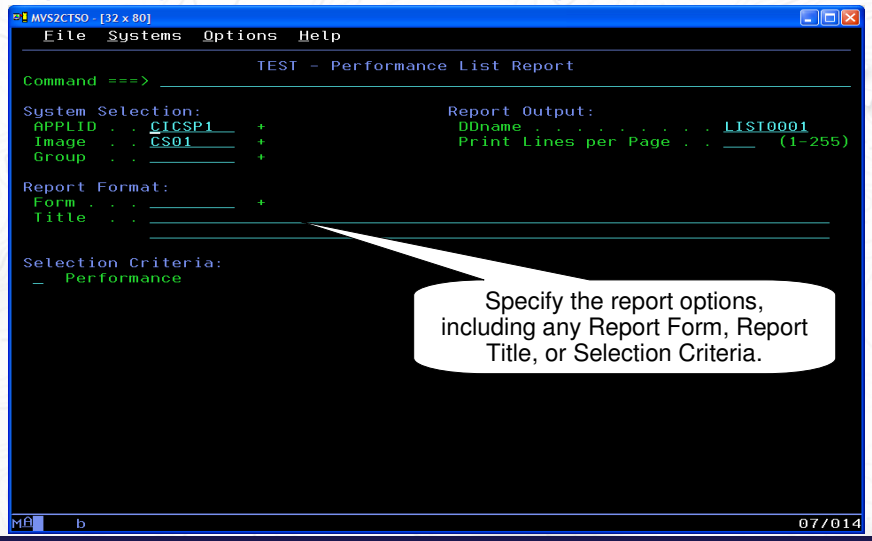
Requesting Reports and Extracts - Notes

Report Sets are where you specify, save and run your report and extract requests. A Report Set contains a set of report and extract requests to be submitted and run as a single job. Reporting options and record selection criteria can be specified at the global-level to apply to all the reports and extracts in the Report Set, or at the report-level to apply to the individual report or extract. Report-level specifications take precedence unless at run time you choose to override them.

In a Report Set, you can request any number of reports and extracts, and any number of instances of them with different reporting options specified. For example, you might request three variations of the Performance List report, one Performance Summary report, and two different Cross-System Work extracts.

When you run a Report Set, CICS PA first prompts you to specify run-time options. Then CICS PA generates a one-step JCL deck with a command stream including active reports and extracts in active report categories.

Requesting a Performance List Report



Requesting a Performance List Report – Notes

The Performance List Report provides a detailed list of the CMF performance class records.

Each CICS PA report has a panel showing all the options available for that report.

The most common report options are:-

- **System Selection** - The APPLID, Image, or Group of Systems that are to be reported.
- **Report Output** - The DDname of the output file to contain the report. CICS PA will automatically generate a unique DDname for each report.
- **Report Format** - The Report Form that will be used to select the report columns. e.g. show the File Control (FC) request counts and elapsed times.
- **Title** - The Title of the report. Specify up to 128 characters of text to describe the report which CICS PA will print at the top of each page of the report below the heading.
- **Selection Criteria** - Filter the report based on date and time, or any CMF field values; e.g. Report Transaction IDs matching HR* with a response time greater than 0.5 seconds.

Performance List Report – Default Format

```
V1R2M0                                          CICS Performance Analyzer
                                                  Performance List

LIST0001 Printed at 15:17:27  1/21/2002    Data from 11:10:29  2/04/1999                        APPLID IYK2Z1V1      Page        1
```

Tran	SC	Term	Userid	RSID	Program	TaskNo	Stop Time	Response Time	Dispatch Time	User CPU Time	Suspend Time	DispWait Time	FC Wait Time	FCAMRq	IR Wait Time
CSSY	U		CBAKER		DFHAPATT	16	11:10:29.803	.0139	.0007	.0006	.0133	.0000	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	17	11:10:29.809	.0185	.0010	.0014	.0175	.0001	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	18	11:10:29.861	.0674	.0196	.0027	.0479	.0269	.0000	0	.0000
CGRP	U		CBAKER		DFHZCGRP	12	11:10:30.194	.4123	.0420	.0074	.3702	.3223	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	15	11:10:30.207	.4204	.0568	.0100	.3636	.1744	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	13	11:10:30.456	.6743	.0728	.0134	.6015	.4000	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	10	11:10:30.531	.7498	.1910	.0228	.5588	.1997	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	14	11:10:31.121	1.3344	.3202	.0378	1.0142	.2626	.0000	1	.0000
CSSY	U		CBAKER		DFHAPATT	11	11:10:31.211	1.4292	.1497	.0313	1.2794	.3461	.0000	0	.0000
CPLT	U		CBAKER		DFHSIPLT	7	11:10:45.642	15.9915	.3383	.0369	15.6532	.0155	.0000	0	.0000
CSSY	U		CBAKER		DFHAPATT	III	11:10:45.856	16.0761	9.3488	2.3435	6.7273	1.1645	.9522	2059	.0000
CWBG	S		CBAKER		DFHWBGB	24	11:10:46.196	.0262	.0248	.0041	.0013	.0012	.0000	0	.0000
CRSQ	S		CBAKER		DFHCRQ	25	11:10:46.856	.0818	.0449	.0040	.0369	.0367	.0000	0	.0000
CXRE	S		CBAKER		DFHZXRE	27	11:10:47.134	.2255	.0243	.0049	.2011	.2009	.0000	0	.0000
CLR2	TO	R11	CBAKER		DFHLUP	29	11:10:48.317	.0263	.0030	.0020	.0232	.0000	.0000	0	.0232
CSFU	S		CBAKER		DFHFCU	26	11:10:48.471	1.6968	1.5899	.1136	.1069	.0294	.0000	0	.0000
CSAC	TO	SAMA	CBAKER		DFHACP	31	11:10:51.227	.5217	.0028	.0011	.5189	.0002	.0000	0	.0000
CLQ2	U		CBAKER		DFHLUP	28	11:10:51.840	3.8259	.0818	.0068	3.7441	.0035	.0000	0	3.7344
CEMT	TO	SAMA	CBAKER		DFHEMTP	32	11:10:51.942	.1877	.1842	.0264	.0035	.0030	.0000	0	.0000
CEMT	TO	SAMA	CBAKER		DFHEMTP	33	11:10:52.549	.0091	.0068	.0026	.0023	.0001	.0000	0	.0000
CEMT	TO	SAMA	CBAKER		DFHEMTP	34	11:10:53.074	.0092	.0068	.0025	.0024	.0000	.0000	0	.0000
CSAC	TO	SAMA	CBAKER		DFHACP	35	11:10:54.113	.5109	.0042	.0012	.5067	.0001	.0000	0	.0000
CSAC	TO	SAMA	CBAKER		DFHACP	36	11:10:55.159	.5150	.0011	.0011	.5139	.0001	.0000	0	.0000

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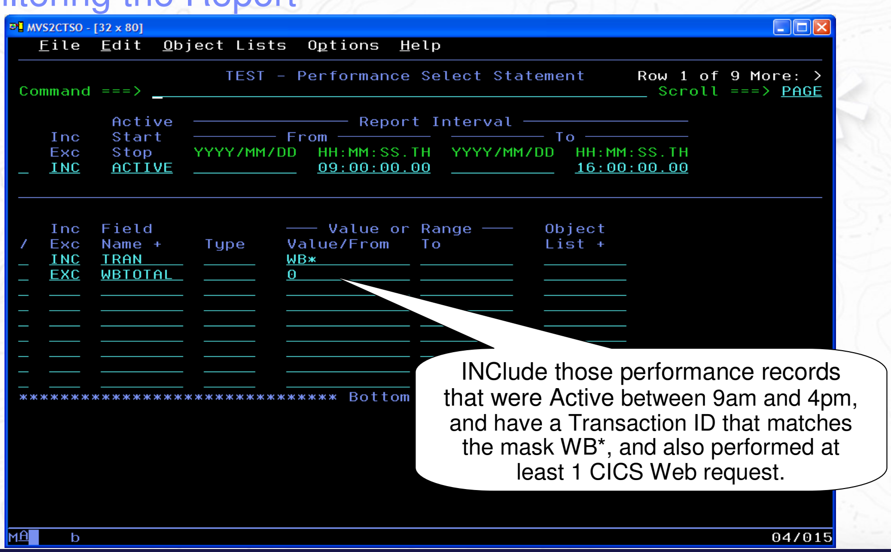
Filtering the Report



Filtering a Report - Notes

All the CICS PA reports and extracts can be filtered using Selection Criteria. You can specify:-

- Global Selection Criteria that applies to all the reports and extracts in a report set
- Local Selection Criteria that applies to a single report or extract.

You can also specify Selection Criteria in a Report Form in order to apply filtering that is applicable to the resources being reported.

The example shown on the visual demonstrates the power of the Selection Criteria. In this example, the transactions are only considered for reporting if:-

- They were active between 9am and 4pm
- Transaction ID names match the mask WB*
- They performed at least 1 CICS Web request.

For character fields, the masking characters % and * are allowed as well as the ability to select null fields by specifying two single quotes.

Most of the CMF fields can be specified in Selection Criteria. Not knowing the field names is never a problem. Simply select from a pop-up list of the CMF field names, which includes a description, the CMF ID, and optional extended information. You can use the FIND command to help locate the field in the list.

Job Submission

- Using the CICS PA ISPF dialog ...
  - Select from Report Sets (menu option 2)
  - Select the RUN option to build the JCL
  - Review the JCL, modify, SUBMIT the job stream for execution
    - Save the job stream(s) in a JCL library (optional)
      - Submit them from there or ...
      - ... as part of any job scheduling or automation process
- To view the output ...
  - Use SDSF (System Display Search Facility), or ...
  - ISPF option 3.8, Outlist Utility

Job Submission – Notes

You can use the CICS PA ISPF dialog to generate the JCL to run a CICS PA Report Set and then use the TSO SUBMIT command to submit the job stream for execution.

After the job has been executed you can then use either the SDSF (System Display Search Facility) or ISPF option 3.8, Outlist Utility, to view the reports.

You can also capture the job streams created by CICS PA and save them in your JCL library and submit them from there or as part of any job scheduling or automation process.

When you submit a CICS PA report request using the RUN command, you are prompted to supply:-

1. System Selection - specify the CICS system or Group of systems that you wish to report against. Use the automatic prompt facility to select the required system or group.
2. Override System Selections - specify this option to override all System Selections in the Report set (Global Options and individual reports) with the System Selection specified here at run-time.
3. Report Time Range - optionally specify the date and time range of the SMF data that you wish to report. This reduces the volume of data and enables more efficient processing.

Report Forms

- Report Forms allow you to ...
  - Tailor the content and format of your Reports and Data Extracts
    - Report Titles and Selection Criteria may also be specified
  - Over 150 sample Report Forms are provided with CICS PA
    - Every aspect of CICS transaction activity and resource usage ...
      - CPU, Storage Usage, Request Analysis, ...
      - CICS RMI Analysis, Abend Analysis, DBCTL, ...
      - Worst CPU, File, Temporary Storage, Transient Data usage, ...
      - Response Time Distribution, ...
      - OMEGAMON, z/OS Communications Server IP CICS Sockets, …
- Supported on ...
  - Performance List, List eXtended, and Summary Reports
  - Cross-System Work Report
  - Performance Data Extract
  - HDB Reports and Extracts

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Report Forms - Notes

Report Forms are used to define the content and format of your reports and data extracts. The various form types can be used by different reports and data extracts, depending on whether they are compatible. i.e. Summary style reports/extracts use Summary Forms. The available form types are:-

- List
- List eXtended (Sorted)
- Summary
- Model (use an existing Report Form as a basis for a new form)
- Model (use an HDB Template as a basis for a new form).

Report Forms allow you to tailor your reports and extracts to include the information that you want to see. You simply edit the report and/or extract format and content to meet your specific reporting or analysis requirements.

Comprehensive online help is available for every CMF field, so that you never need to reference a manual.

When creating a report form you can edit the report or extract format by selecting fields from either a list of all the CMF data fields or just the fields from a specific field category. Some examples of the field categories that are defined in CICS PA are for a terminal-owning or application owning region, or the standard CMF field groups such as DFHCICS, DFHSTOR or DFHTASK.

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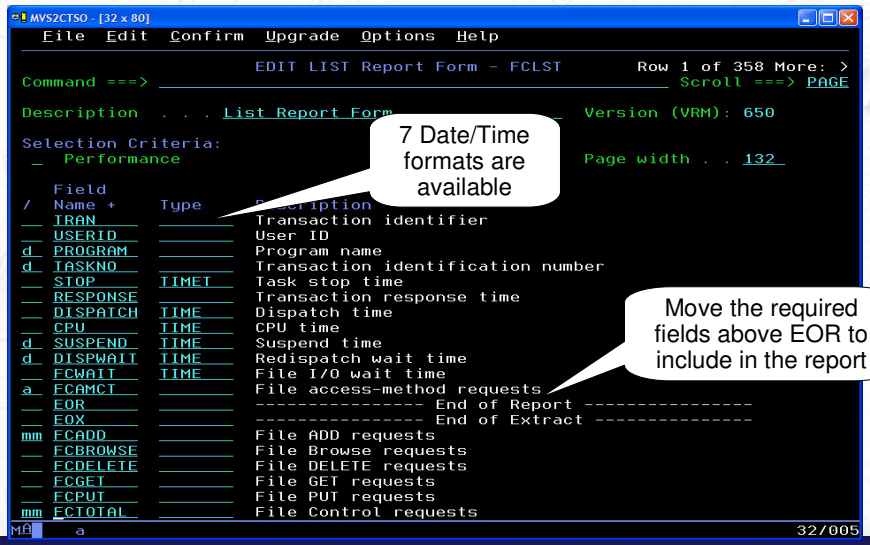
Tailoring the Performance LIST Report Format



Tailoring Performance LIST Report Format - Notes

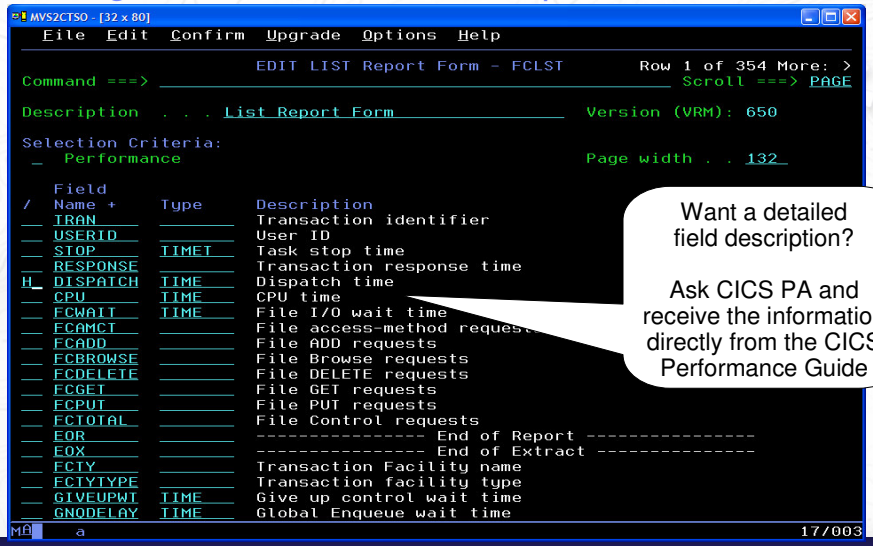
When you request a new Report Form, a table of the CMF fields is presented that you can then edit. The Report Form initially consists of 2 sections:-

1. The top section of the Report Form shows the fields in the default report, across the page from left to right.
   The 'EOR' marker defines the page width boundary for the report and the 'EOX' marker defines the end of the record for an extract. Fields below the 'EOR' marker are not included in the report and CICS PA will automatically adjust the 'EOR' marker when you edit your Report Form, so that you are aware of where your report finishes.
2. Fields below the 'EOR' marker will not appear in the report and fields below the 'EOX' marker will not appear in the extract. To include any of these fields in the report or extract, simply move them above the 'EOR' or 'EOX' markers, and remove any unwanted report fields.

The Report Form (shown on the previous slide) shows the edit commands necessary to include File Control requests in the Performance List Report.

The Report Form also allows the inclusion of Selection Criteria to apply filtering that is applicable to the resources being reported by the Report Form.

Tailoring the Performance List Report Format



Tailoring the Performance List Report Format – Notes

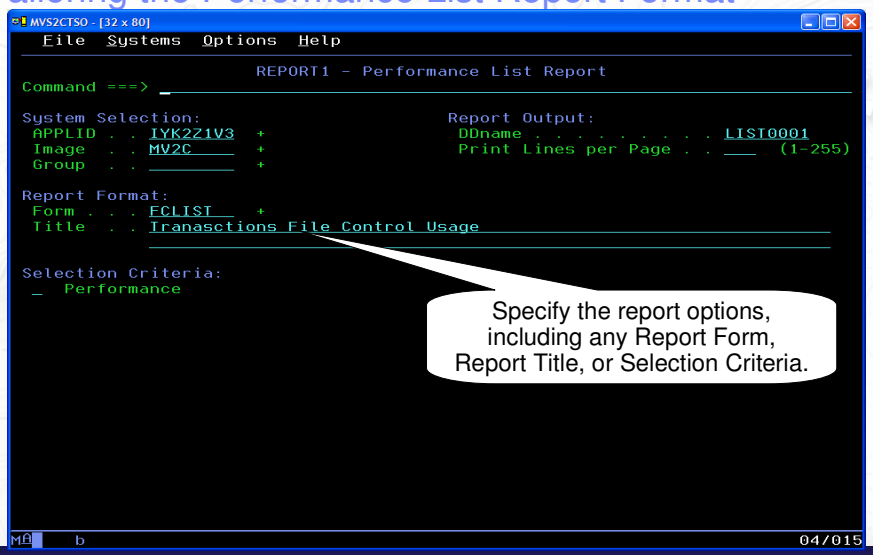
The Report Form (shown on the previous slide) shows the result of the edit commands to include the File Request fields. After you have saved this Report Form, you can request it by name in as many Performance List Reports or Performance Export Extracts as you like.

Each field has a short description. You can also request (using line command H) a full explanation of each field, which is taken from the CICS Performance Guide.

Scroll right to:-

- Enter a title for the report defined by the Report Form, or ...
- To view the fields' CMF Dictionary definition, e.g. FCAMCT DFHFILE A070. CMF Clock Fields have two (2) components:-
  - Elapsed time
  - Count.
- Both can be requested from the dialog, so for Dispatch time, you can report the:-
  - Elapsed time that the transaction was dispatched by CICS
  - Number of times that the transaction was dispatched by CICS.

Tailoring the Performance List Report Format



Performance List Report – File Requests

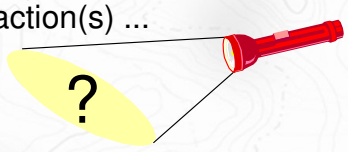
```
V1R2M0                                          CICS Performance Analyzer
                                                     Performance List

LIST0001 Printed at 10:32:09  2/07/2002    Data from 11:17:21  2/04/1999                    APPLID IYK2Z1V3      Page       4
Transaction File Control Usage

 Tran Userid   Stop          Response Dispatch User CPU  FC Wait   FCAMRq    FCADD FCBROWSE FCDELETE    FCGET    FCPUT FC Total
              Time           Time     Time     Time      Time
 TRUE BRENNER 11:17:23.394   2.0973    .0014    .0010    .0000         0        0        0        0        0        0        0
 MENU BRENNER 11:17:26.064    .0019    .0019    .0015    .0000         0        0        0        0        0        0        0
 SAL1 BRENNER 11:17:31.629    .1657    .0074    .0061    .0186        12        2        0        0        4        2       10
 RED1 BRENNER 11:17:32.050    .5333    .0055    .0040    .0000         0        0        0        0        0        0        0
 STOC BRENNER 11:17:32.053    .5145    .0033    .0030    .0000         0        0        0        0        0        0        0
 SALE BRENNER 11:17:32.054    .5675    .0263    .0124    .0493        28        6        0        0        8        4       22
 INV1 BRENNER 11:17:32.090    .0359    .0059    .0051    .0096        11        1        0        1        3        1        7
 CITS CBAKER  11:17:33.282    .0126    .0036    .0031    .0000         0        0        0        0        0        0        0
 DEL1 BRENNER 11:17:33.286   1.2323    .0057    .0051    .0099        15        1        0        1        3        1        7
 SALE BRENNER 11:17:33.309   1.2198    .0086    .0047    .0130        10        0        0        1        4        2        9
 SALE BRENNER 11:17:33.366    .0800    .0091    .0084    .0378        20        1        0        1        6        3       14
 SALE BRENNER 11:17:33.417    .0519    .0083    .0076    .0203        16        1        0        1        6        3       14
 STAT CBAKER  11:17:35.081   1.8129    .0178    .0028    .0000         0        0        0        0        0        0        0
 SAL1 BRENNER 11:17:37.764    .0019    .0019    .0015    .0000         0        0        0        0        0        0        0
 SALE BRENNER 11:17:38.653    .0566    .0083    .0069    .0312        18        2        0        1        6        3       15
 REM1 BRENNER 11:17:38.677    .0243    .0050    .0047    .0085         9        1        0        1        3        1        7
 SALE BRENNER 11:17:38.716    .0389    .0067    .0062    .0157        16        1        0        1        6        3       14
 SAL1 BRENNER 11:17:39.265    .0015    .0014    .0013    .0000         0        0        0        0        0        0        0
 PAYM BRENNER 11:17:42.168    .0014    .0014    .0013    .0000         0        0        0        0        0        0        0
 SALE BRENNER 11:17:43.924    .0826    .0082    .0073    .0563        16        1        0        1        6        3       14
 REM1 BRENNER 11:17:43.960    .0367    .0054    .0052    .0181         9        1        0        1        3        1        7
 SALE BRENNER 11:17:44.042    .0824    .0072    .0069    .0561        16        1        0        1        6        3       14
 SALE BRENNER 11:17:49.129    .0463    .0074    .0068    .0189        16        1        0        1        6        3       14
```


Performance List Extended Report

- Similar to the Performance List Report
  - But allows you to Sort the data for your report
- Sorting Criteria ...
  - Up to three sort fields - ascending or descending
    - Subset of the CMF data fields can be sorted upon
  - Any CMF data field can be included in the report
- For Example .... which Transaction(s) ...
  - have the longest Response time
  - have the longest Suspend time
  - used the most CPU time
  - did the most File or Temporary Storage requests



Performance Summary Report

- Sort and Summarize the performance data in your report
- Sorting Criteria ...
  - Up to eight sort fields ...
    - Ascending or Descending sequence (in any combination)
- Statistics functions available include …
  - Avg, Min, Max, Total, Std Deviation, Peak Percentile, Range, ...
- Reporting Options ...
  - Time Interval
  - Totals Level ...
    - Blank - Suppress totals
    - 0 through 8 - Optional Grand Totals

Performance Summary Report – Notes …

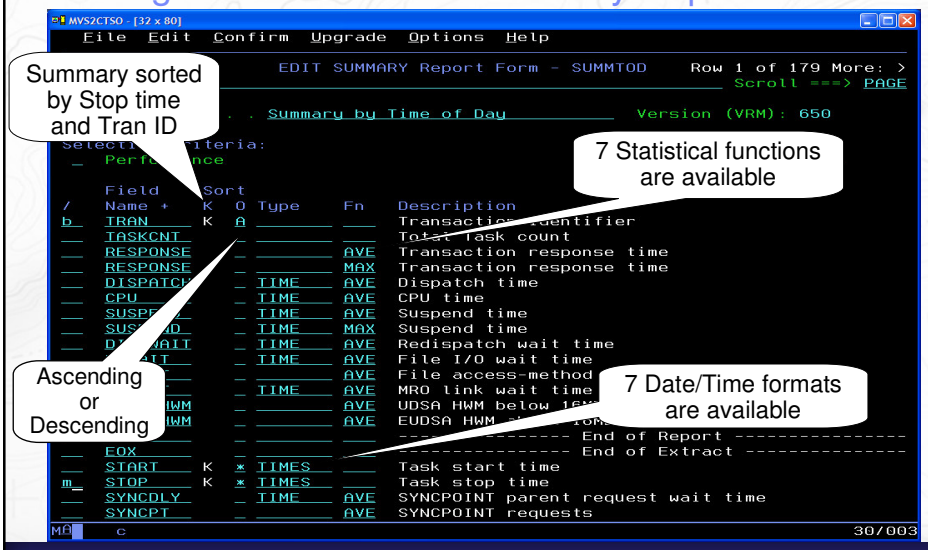
The Performance Summary Report provides a summary of the CMF performance class records. The default report format summarizes the performance class records by Transaction ID. The Task Count (#Tasks) shows the number of performance class records processed during the reporting period.

The report format can be tailored to include information more specific to your reporting requirements. Any CMF field (including fields from User-Defined EMPs) can be included in the Performance Summary Report.

Summary Report Forms also allow you to Sort and Summarize your report. The Clock and Count fields can be summarized statistically. The statistical functions available with CICS PA are:-

- Average (this is the default)
- Minimum
- Maximum
- Total
- Standard deviation
- nnn Peak Percentile (in the range 50 to 100)
- Range (Distribution).

Tailoring the Performance Summary Report …



Tailoring the Performance Summary Report – Notes

The Report Form (shown on the previous slide) shows the edit commands required to alter the report format to summarize transaction activity by time of day. After you have saved this Report Form, you can request it by name in as many Performance Summary Reports or Performance Export Extracts as you like.

The time interval defaults to 1 minute. The Summary Report options can override this, so that this Report Form may be used for multiple reports using any time interval.

The Performance Summary Report (shown on the slide) summarizes the transaction activity for each 1 minute time interval. This report can be easily changed to display other performance related data. Many sample Report Forms are provided with CICS PA for this purpose.

You can specify the time interval anywhere from 1 second to 24 hours (rounded down to align to the hour or day).

You can also write your Performance Summary report data to an extract data set. This is done using the Export facility with a SUMMARY Report Form to define the record layout and summarization criteria. An example of using the Export facility in this way will be shown later in the presentation.

Performance Summary Report by Time-of-Day

```
 V2R1M0                                          CICS Performance Analyzer
                                                   Performance Summary

SUMM0001 Printed at 16:18:47  1/21/2002     Data from 11:10:29  2/04/1999 to 08:10:06  2/16/1999                    Page       1

                                 Avg       Max       Avg       Avg       Avg       Avg       Avg       Avg       Avg       Avg       Avg
Stop     Tran       #Tasks Response  Response Dispatch User CPU  Suspend DispWait  FC Wait    FCAMRq   IR Wait SC24UHWM SC31UHWM
Interval                      Time      Time      Time      Time      Time      Time      Time                 Time
11:10:00 CEMT            6   .0608     .1877     .0579     .0105     .0029     .0011     .0000         0    .0000         0         0
11:10:00 CGRP            2   .5862     .7601     .0571     .0076     .5291     .4134     .0000         0    .0000         0         0
11:10:00 CLQ2            2  2.0731    3.8259     .0628     .0068    2.0103     .0820     .0000         0   1.9054         0         0
11:10:00 CLR2            2   .0604     .0946     .0030     .0020     .0574     .0000     .0000         0    .0135         0         0
11:10:00 CPLT            2 18.3106   20.6297     .3495     .0372   17.9611     .0176     .0000         0    .0000         0         0
11:10:00 CRSQ            2   .0731     .0818     .0416     .0039     .0315     .0313     .0000         0    .0000         0         0
11:10:00 CSAC            5   .5138     .5217     .0023     .0011     .5115     .0001     .0000         0    .0000         0         0
11:10:00 CSFU            2  2.7193    3.7417    2.2322     .1714     .4871     .0232     .0000         0    .0000         0         0
11:10:00 CSSY           18  2.5720   20.7042    1.3231     .3193    1.2489     .2908     .1534       269    .0000         0       180
11:10:00 CSTE            2   .1338     .1420     .1250     .0125     .0088     .0086     .0000         0    .0000         0         0
11:10:00 CWBG            2   .0267     .0273     .0255     .0039     .0012     .0010     .0000         0    .0000         0         0
11:10:00 CXRE            2   .1275     .2255     .0265     .0049     .1010     .1008     .0000         0    .0000         0         0
11:10:00 CZUX            1   .0344     .0344     .0331     .0078     .0013     .0016     .0000         0    .0000         0     43552
11:10:00 CZXS            1   .0907     .0907     .0340     .0078     .0567     .0016     .0000         0    .0000         0     43712
-------------------------------------------------------------------------------------------------------------------------------------
11:10:00                49  1.9914   20.7042    .6140     .1292    1.3773     .1347     .0564        99    .0783         0      1847

11:11:00 ABRW            1   .5819     .5819     .0783     .0121     .5037     .0127     .0000         0    .4908      1072         0
11:11:00 AMNU            1   .1724     .1724     .1720     .0091     .0004     .0004     .0000         0    .0000       512         0
11:11:00 CATA            4   .0409     .0537     .0253     .0084     .0156     .0003     .0000         0    .0000         0         0
11:11:00 CEMT            4  2.1512    4.3841    .0047     .0019    2.1465     .0000     .0000         0    .0000         0         0
11:11:00 CESN            8   .0319     .0806     .0304     .0094     .0015     .0014     .0000         0    .0000         0         0
11:11:00 CQRY            7   .3709     .7437     .0114     .0020     .3595     .0009     .0000         0    .0000         0         0
11:11:00 CSMI            1   .5116     .5116     .4563     .0395     .0552     .0032     .0056         6    .0246        96         0
11:11:00 CZUX            1   .0092     .0092     .0056     .0050     .0037     .0003     .0000         0    .0000         0     29792
-------------------------------------------------------------------------------------------------------------------------------------
11:11:00                27   .4776    4.3841    .0428     .0073     .4348     .0013     .0002         0    .0191        62      1103
```


Performance Summary Report – Distributions

```
 V2R1M0                                          CICS Performance Analyzer
                                                   Performance Summary

SUMM0003 Printed at 15:14:26  2/14/2007     Data from 08:27:42  1/30/2007 to 09:19:35  1/30/2007                    Page       8
Transaction Response Time Distribution Summary (Percentage) by Time-of-Day

                                <0.1 0.1-0.25 0.25-0.5 0.5-0.75 0.75-1.0  1.0-1.5  1.5-2.0 2.0-10.0    >=10.0       Max       Avg
Stop     Tran       #Tasks Response Response Response Response Response Response Response Response Response  Response  Response
Interval                      Time      Time      Time      Time      Time      Time      Time      Time      Time      Time      Time
09:16:00 WMSC            24 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0004     .0004
09:16:00                 29  89.66     6.90      3.45       .00       .00       .00       .00       .00       .00     .2788     .0212

09:17:00 CEDF             9  11.11      .00       .00     22.22     11.11     22.22     22.22     11.11       .00    2.1832    1.1744
09:17:00 CEMT             1    .00      .00       .00       .00       .00       .00       .00       .00    100.00   14.9315   14.9315
09:17:00 WMSC            24 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0004     .0004
09:17:00                 34  73.53      .00       .00      5.88      2.94      5.88      5.88      2.94      2.94    14.9315    .7503

09:18:00 CATA             1 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0332     .0332
09:18:00 CEDF             3    .00      .00       .00       .00       .00     33.33       .00     33.33     33.33   32.6115   13.0935
09:18:00 CEJR             2  50.00      .00     50.00       .00       .00       .00       .00       .00       .00     .3164     .1583
09:18:00 CEMT             3 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0588     .0216
09:18:00 CESN             1    .00   100.00       .00       .00       .00       .00       .00       .00       .00     .2283     .2283
09:18:00 CGRP             1    .00   100.00       .00       .00       .00       .00       .00       .00       .00     .1779     .1779
09:18:00 CISC             1    .00   100.00       .00       .00       .00       .00       .00       .00       .00     .1499     .1499
09:18:00 CPIR             7  57.14    28.57     14.29       .00       .00       .00       .00       .00       .00     .3686     .0875
09:18:00 CPLT             1    .00      .00       .00       .00       .00       .00       .00    100.00       .00    6.2207    6.2207
09:18:00 CQRY             1    .00   100.00       .00       .00       .00       .00       .00       .00       .00     .1021     .1021
09:18:00 CRSQ             1 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0998     .0998
09:18:00 CSSY             9  33.33    44.44     11.11       .00       .00       .00       .00     11.11       .00    6.3256     .8250
09:18:00 CWBG             1 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0420     .0420
09:18:00 CXRE             1 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0552     .0552
09:18:00 DPL3             1    .00      .00       .00       .00       .00       .00       .00       .00    100.00   50.0251   50.0251
09:18:00 WMSC            19 100.00      .00       .00       .00       .00       .00       .00       .00       .00     .0005     .0004
09:18:00                 53  64.15    18.87      5.66       .00       .00      1.89       .00      5.66      3.77   50.0251    1.9781

Total                  1317  75.40     4.56      2.96      4.86      2.51      3.19      1.75      3.04      1.75 1887.437    6.3369
```

Performance Wait Analysis Report

- Summary of transaction activity by wait (suspend) time
  - Summary data and Suspend Detail data
- Summarized by transaction ID (default), highlights ...
  - the resources that cause a transaction to be suspended
  - the CICS system resource bottlenecks that may be causing bad response time
- Enables a detailed analysis to be more easily performed
  - Focusing on the problem resources identified

Performance Wait Analysis Report …

```
V1R3M0                                          CICS Performance Analyzer
                                                   Wait Analysis Report

WAIT0001 Printed at 14:01:01  7/24/2003    Data from 19:26:39  7/14/2003 to 19:38:16  7/14/2003                    Page       1

------------------------------------------------------------------------------------------------------------------------------------
Tran=CBM1
  Summary Data                                                 -------- Time ---------     ------ Count ------     ------ Ratio ------
                                                                     Total     Average       Total    Average
    # Tasks                                                                                   3962
    Response Time                                              39174.1585      9.8875
    Dispatch Time                                               4860.6282      1.2268      347472       87.7     12.4% of Response
    CPU Time                                                     179.7728      0.0454      347472       87.7      3.7% of Dispatch
    Suspend Wait Time                                          34313.4642      8.6606      347472       87.7     87.6% of Response
    Dispatch Wait Time                                         26770.4022      6.7568      343510       86.7     78.0% of Suspend
    Resource Manager Interface (RMI) elapsed time               4302.4135      1.0859      191768       48.4     11.0% of Response
    Resource Manager Interface (RMI) suspend time               2641.0973      0.6666       19211        4.8      7.7% of Suspend

  Suspend Detail                                               ------------------- Suspend Time -------------------- ----- Count -----
                                                                     Total     Average   %age  Graph                      Total  Average
    N/A      Other Wait Time                                   21836.2138      5.5114  63.6% |***********              332847     84.0
    MAXOTDLY MAXOPENTCBS wait time                              4094.5942      1.0335  11.9% |**                         639      0.2
    LU62WTT  LU6.2 wait time                                    3035.7758      0.7662   8.8% |*                          5238      1.3
    DSPDELAY First dispatch wait time                           2398.0299      0.6053   7.0% |*                          3962      1.0
    MXTDELAY > First dispatch MXT wait time                      374.7682      0.0946   1.1% |                            87      0.0
    LMDELAY  Lock Manager (LM) wait time                        2206.6980      0.5570   6.4% |*                         2621      0.7
    GVUPWAIT Give up control wait time                           437.0868      0.1103   1.3% |                          277      0.1
    JCIOWTT  Journal I/O wait time                               305.0656      0.0770   0.9% |                         1888      0.5

------------------------------------------------------------------------------------------------------------------------------------
Tran=CBPB
  Summary Data                                                 -------- Time ---------     ------ Count ------     ------ Ratio ------
                                                                     Total     Average       Total    Average
    # Tasks                                                                                     13
      ....
```

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Cross-System Work Report

- Provides a report that correlates the CMF data by Network Unit-of-Work id ...
  - Default report includes only the performance class records that have the same network unit-of-work in multiple records in a single or multiple systems
- Records sorted by ...
  - Network Unit-of-Work Prefix and Suffix
  - Syncpoint count concatenated with either …
    - the task stop time (descending order), or
    - the task start time (ascending order)
  - Generic APPLID
- Report format can be tailored using Report Forms
- Selection Criteria ...
  - Record selection and/or Unit-of-Work selection

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Cross-System Work Report - Default

```
 V1R2M0                                           CICS Performance Analyzer
                                                     Cross-System Work

CROS0001 Printed at 12:09:28  1/24/2002 Data from 11:10:51  2/04/1999 to 08:10:28  2/16/1999                         Page       3

                                         Request           Fcty  Conn                         UOW                  R              Response A
Tran Userid   SC TranType Term  LUName    Type   Program  T/Name Name NETName                 Seq APPLID      Task T  Stop Time     Time   B

ABRW BRENNER  TP U        S23D  IGCS23D  AP:     DFHúABRW T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      61 T 11:13:20.275    .0080
CSMI CBAKER   TO UM       R11   IYK2Z1V1 FS:F--- DFHMIRS  T/R11  CJB1 GBIBMIYA.IGCS23D          1 IYK2Z1V3      57 T 11:13:20.274    .0044

ABRW BRENNER  TP U        S23D  IGCS23D  AP:     DFHúABRW T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      62 T 11:13:21.332    .0064
CSMI CBAKER   TO UM       R11   IYK2Z1V1 FS:F--- DFHMIRS  T/R11  CJB1 GBIBMIYA.IGCS23D          1 IYK2Z1V3      58 T 11:13:21.331    .0039

CEDA BRENNER  TO U        S23D  IGCS23D  AP:     DFHEDAP  T/S23D      GBIBMIYA.IGCS23D          3 IYK2Z1V1      72 T 11:16:28.284   1.1025
CEDA BRENNER  TO U        S23D  IGCS23D  AP:     DFHEDAP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      72 C 11:16:27.181   3.0046
CEDA BRENNER  TO U        S23D  IGCS23D  AP:     DFHEDAP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      72 C 11:16:24.177   2.2127
CEDA BRENNER  TO U        S23D  IGCS23D  AP:     DFHEDAP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      72 C 11:16:21.964  46.5125
CEDA BRENNER  TO U        S23D  IGCS23D  AP:     DFHEDAP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1      72 C 11:15:35.451    .6794

CEMT BRENNER  TO U        S23D  IGCS23D  AP:     DFHEMTP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     140 T 11:21:24.062  51.3442
CEMT BRENNER  TO U        S23D  IGCS23D  AP:     DFHEMTP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     140 C 11:20:32.718   8.3481
CEMT BRENNER  TO U        S23D  IGCS23D  AP:     DFHEMTP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     140 C 11:20:24.370    .0042

CEMT BRENNER  TO U        S23D  IGCS23D  AP:     DFHEMTP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     174 T 11:21:28.662   1.1930
CEMT BRENNER  TO U        S23D  IGCS23D  AP:     DFHEMTP  T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     174 C 11:21:27.469    .0041

RMST BRENNER  TO U        S23D  IGCS23D  TR:CJB3          T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     178 T 11:22:38.447  48.9210
STAT CBAKER   TO U        R11   IYK2Z1V1 AP:     DFH0STAT S/S23D CJB1 GBIBMIYA.IGCS23D          1 IYK2Z1V3     349 T 11:22:38.433  66.7720
RMST BRENNER  TO U        S23D  IGCS23D  TR:CJB3          T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     178 C 11:21:49.526  10.0524
RMST BRENNER  TO U        S23D  IGCS23D  TR:CJB3          T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     178 C 11:21:39.473   7.8027
RMST BRENNER  TO U        S23D  IGCS23D  TR:CJB3          T/S23D      GBIBMIYA.IGCS23D          1 IYK2Z1V1     178 C 11:21:31.671    .0110
```

Extract Data Sets – Record Selection Extract

- Creates a new SMF Data Set
  - CICS SMF 110 CMF and Statistics Records
  - DB2 SMF 101 Accounting Records
  - WebSphere MQ SMF 116 Accounting Records
  - OMEGAMON XE for CICS SMF 112 Records
  - z/OS System Logger SMF 88 Records
- SMF Data volume reduction
  - Filter large SMF files, ...
- Record selection ...
  - CICS, DB2, WebSphere MQ and Logger System Selection
  - Performance and Exception Record Selection Criteria
  - Run-time SMF reporting interval
- Extracts can be played back into CICS PA

Transaction Resource Usage Reports

- Transaction Resource Usage Reports ...
  - Transaction Resource Usage List
    - File and Temporary Storage Queue
  - Transaction File Usage Summary
  - Transaction Temporary Storage Usage Summary
  - File Usage Summary
    - File Usage by Transaction ID
  - Temporary Storage Usage Summary
    - Tsqueue Usage by Transaction ID
- Transaction Resource Usage Reports ...
  - CMF Resource Data and Performance Data

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Transaction Resource Usage Reports – Notes

The CICS PA Transaction Resource Usage Reports provide a detailed analysis of the Resource Class records collected by the CICS Monitoring Facility (CMF). The reports include:-

- Transaction Resource Usage List
- Transaction File Usage Summary and Temporary Storage Usage Summary
- File Usage Summary and Temporary Storage Usage Summary.

The Transaction Resource Usage List report provides a list of all Transaction resource class records in the sequence that they appear in the SMF file. It gives Transaction Information, detailing their individual File and Temporary Storage Queue usage.

The Transaction File Usage Summary report summarizes File usage by Transaction ID. For each Transaction ID, it gives Transaction information and File Control statistics followed by a breakdown of File usage for each File used.

The File Usage Summary report (shown on the next slide) summarizes File activity. For each File, it gives a breakdown of File usage by Transaction ID.

The Transaction File Summary Usage report summarizes File usage by Transaction ID. For each Transaction ID, it gives Transaction information and File Control statistics followed by a breakdown of File usage for each File used.

There is a similar set of Summary reports available for Temporary Storage Queue usage.

You can specify Performance Selection Criteria to provide record selection for the Transaction Resource Class data and Performance Class data, including Filename and Temporary Storage Queue Name.

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Transaction Resource Usage Reports – Usage List

```
 V1R3M0                                   CICS Performance Analyzer
                                      Transaction Resource Usage List

RESU0001 Printed at 15:18:36  6/19/2003    Data from 14:49:42  6/19/2003                                      Page       7

                                     Request           Fcty  Conn                                  UOW R                  Response
Tran  Userid   SC TranType Term   LUName   Type   Program  T/Name Name        NETName       APPLID   Task Seq T  Stop Time    Time
---- -------- -- -------- ----  -------- ------- -------- ------ ---- ----------------- --------  ---- --- - ------------ --------
AUPD CBAKER   TP U        TC28  IYCWTC28 AP:     DFHúAALL T/TC28      GBIBMIYA.IYCWTC28 IYK2Z1V1    91   1 T 15:13:39.474    .0072

                               ********************* FC Calls ******************** ******* I/O Waits ********  AccMeth
  File                           Get      Put     Browse    Add     Delete    Total     File     RLS      CFDT   Requests
 --------                      -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
 FILEA              Elapse      .0001    .0047    .0000    .0000    .0000    .0048    .0032    .0000    .0000
                    Count           1        1        0        0        0        2        1        0        0        4

---- -------- -- -------- ----  -------- ------- -------- ------ ---- ----------------- --------  ---- --- - ------------ --------
CECI CBAKER   TO U        TC05  IYCWTC05 AP:     DFHECIP  T/TC05      GBIBMIYA.IYCWTC05 IYK2Z1V1    69   1 T 15:14:26.435 266.7346

                               ********************* FC Calls ******************** ******* I/O Waits ********  AccMeth
  File                           Get      Put     Browse    Add     Delete    Total     File     RLS      CFDT   Requests
 --------                      -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
 FILEA              Elapse      .0000    .0000    .0001    .0000    .0000    .0002    .0000    .0000    .0000
                    Count           0        0        5        0        0        6        0        0        0        7

                               ************* TS Calls ************ *** I/O Waits ***          ********* TS Item ********
  TSQueue                         Get    Put_Aux Put_Main  Total      TS     Shr_TS              Get    Put_Aux Put_Main
 ----------------              -------- -------- -------- -------- -------- --------          -------- -------- --------
 TESTQ1             Elapse      .0000    .0000    .0017    .0017    .0000    .0000
                    Count           0        0        3        3        0        0  Length          0        0      360

 TESTQ2             Elapse      .0000    .0000    .0000    .0000    .0000    .0000
                    Count           0        2        0        2        0        0  Length          0      120        0

 Total              Elapse      .0000    .0000    .0017    .0017    .0000    .0000
                    Count           0        2        3        5        0        0  Length          0      120      360
```

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DB2 Reports

- DB2 Reports ...
  - CMF Performance Data - SMF 110
  - DB2 Accounting Data - SMF 101
  - List, Long Summary, Short Summary, Recap
  - Class 1, Class 2 and Class 3 Timing, ...
  - Buffer Manager Summary, Locking Summary, ...
  - SQL Data Manipulation Language (DML), ...
  - Information provided to 'link' to DB2 PE or DB2 PM Reports ...
    - Timestamps, Thread Correlation, ...
    - UOWID, UOWSEQ, ... LUWID, LUWSEQ
- Tailoring DB2 Reports
  - List, Summary (Short or Long)

DB2 Reports – Notes

The CICS PA DB2 Reports combine the CICS CMF performance class records (SMF 110) with the DB2 Accounting records (SMF 101) belonging to the same network unit-of-work that includes some DB2 activity to produce detail and/or summary reports showing DB2 usage for your CICS systems.

The CICS PA DB2 Reports are:-

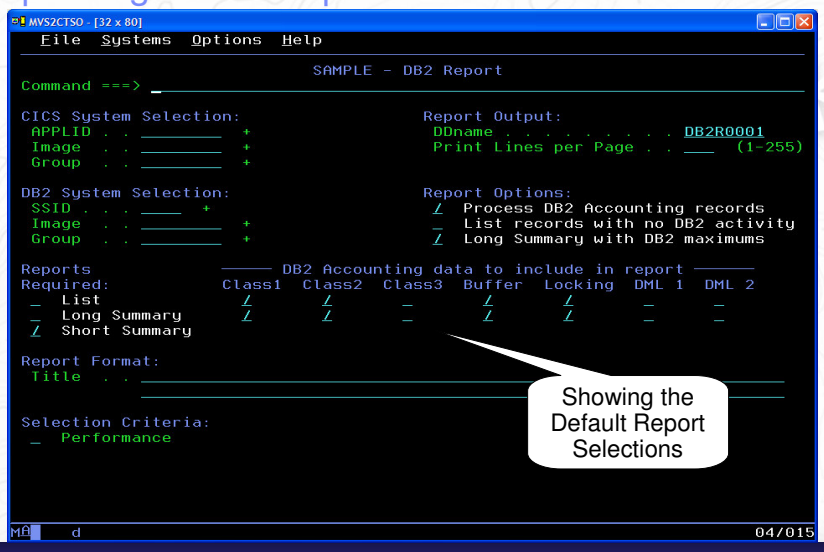
- List
- Summary (Short or Long)
- Recap (record processing statistics).

To produce the DB2 Reports, you need to accumulate DB2 Accounting statistics (SMF 101 records) and define your CICS-DB2 resources with **ACCOUNTREC(TASK)** or **ACCOUNTREC(UOW)**. CICS PA Version 2 Release 1 supports the DB2 Accounting statistics data from DB2 Version 6, Version 7, Version 8, and Version 9.

The information provided in the CICS PA DB2 Reports can be used to assist in further analysis using DB2 performance reporting tools such as the IBM DB2 Performance Expert (DB2 PE) or DB2 Performance Monitor (DB2 PM).

The CICS PA DB2 List report is at its most effective when used in conjunction with the CICS PA Cross-System Work report.

Requesting a DB2 Report



Requesting a DB2 Report – Notes

The DB2 Report panel shows the options available when requesting a DB2 Report:-

- You can request a detailed List report, a Long Summary report and/or a Short Summary report.
- CICS System Selection identifies the CICS Systems (APPLIDs) that you want to report against.
- DB2 System Selection identifies the DB2 Subsystems (used by the specified CICS systems) that you want to report against. You do not need to specify this if:-
  - Your CICS System Selection specifies a Group that contains DB2 SSIDs, or
  - The DB2 Accounting records are contained in the same files as the CICS System's CMF Performance records.
- Select Process DB2 Accounting records to process DB2 Accounting (SMF 101) records. Otherwise, CICS PA reports only the DB2 statistics contained in the CMF Performance records.
- Select List records with no DB2 activity to report CMF performance records with DB2REQCT=0 provided they are part of a network unit-of-work that has some DB2 activity. This option applies only to the DB2 List report.
- Select Long Summary with DB2 maximums to include average and maximum values in the DB2 Accounting detail lines of the report. Otherwise, only average values are reported.
- Specify Selection Criteria to Include or Exclude:-
  - CMF Performance records based on (a) specified time intervals and/or (b) particular field values.
  - DB2 Accounting records based on (a) whether the DB2 thread Begin-End times are within the specified time intervals and/or (b) UOWID field values.

DB2 Reports – List

```
V1R2M0                                          CICS Performance Analyzer
                                                       DB2 - List

DB2R0001 Printed at 10:14:46  2/13/2002    Data from 13:31:17  1/24/2002 to 13:32:08  1/24/2002                    Page       1


Tran/ Userid/ Program/                UOW R               ..DB2 Wait Time..   DB2    User CPU                                  Response A
SSID  Authid  Planname  APPLID    Task Seq T Term  LUName   Connect  Thread   ReqCnt    Time     Start Time    Stop Time     Time   B

WROS RAIMAN   CRWWPPOS STM4IRA1  34695   1 T <ADQ STM4IRT1    .0000    .0000       18    .3112  13:31:23.053 13:31:34.349  11.2956

CH1G STM4IRA1 CRWWPPOS STM4IRA1  34695  Thread Identification   ID=ENTRWROS0037  NETName=USIBMSY.LE000081   UOWID=16372A6C7E14
                                                               Begin Time: 13:31:23.056  1/24/02  End Time: 13:31:35.378  1/24/02
                                       Class1: Thread Time     Elapsed= 12.3218  CPU= .310480
                                       Class2: In-DB2 Time     Elapsed= 11.2359  CPU= .309914
                                       Class3: Suspend Time    Total  =  6.5988  I/O=  2.3726  Lock/Latch=  4.2262  Other=    .0000
                                       Buffer Manager Summary  GtPgRq=     8120  SyPgUp=        8
                                       Locking Summary         Suspnd=       11  DeadLk=        0  TmeOut=        0  MxPgLk=        1
                                       SQL DML Query/Update    Sel=          2  Ins=           0  Upd=           0  Del=           0
                                       SQL DML 'Other'         Des=          0  Pre=           0  Ope=           3  Fet=          13  Clo=          0

WRNO RAIMAN   CRWWPPNO STM4IRA1  34869   1 T <ACY STM4IRT1    .0000    .0000       67    .0114  13:31:38.853 13:31:45.875   7.0220

CH1G STM4IRA1 CRWWPPNO STM4IRA1  34869  Thread Identification   ID=ENTRWRNO0051  NETName=USIBMSY.LE000081   UOWID=1637397E8927
                                                               Begin Time: 13:31:38.854  1/24/02  End Time: 13:31:45.808  1/24/02
                                       Class1: Thread Time     Elapsed=  6.9534  CPU= .010208
                                       Class2: In-DB2 Time     Elapsed=  6.8909  CPU= .008283
                                       Class3: Suspend Time    Total  =  6.3783  I/O=   .0000  Lock/Latch=  6.3783  Other=    .0000
                                       Buffer Manager Summary  GtPgRq=      173  SyPgUp=       36
                                       Locking Summary         Suspnd=       2  DeadLk=        0  TmeOut=        0  MxPgLk=       15
                                       SQL DML Query/Update    Sel=          1  Ins=          12  Upd=          11  Del=           0
                                       SQL DML 'Other'         Des=          0  Pre=           0  Ope=          12  Fet=          21  Clo=         10
```

CMF performance data

Associated DB2 Accounting data

DB2 Reports – List - Notes

The DB2 List report provides a detailed list by transaction of all network units-of-work with DB2 activity. Records that are part of the same network unit-of-work are printed sequentially in groups with a blank line separator. A data line (column format) is presented for each CMF performance class record, and a block of data lines (row format) is presented for each associated DB2 Accounting record.

The report includes the following DB2 information (depending on the selected options):-

1. DB2 Thread Identification, for easy cross-reference to DB2 PE or DB2 PM reports
2. Class 1 Thread elapsed and CPU times
3. Class 2 In-DB2 elapsed and CPU times
4. Class 3 Suspend times
5. Buffer Manager statistics
6. Locking statistics
7. SQL DML statistics.

The DB2 Short Summary report (shown on the next slide) is an abridged version of the Long Summary report. It provides averages only (no maximums). Both the CMF performance and DB2 accounting record details are presented in column format.

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DB2 Reports – Short Summary

V1R2M0 CICS Performance Analyzer

DB2 - Short Summary

DB2R0001 Printed at 10:14:46 2/13/2002 Data from 13:31:17 1/24/2002 to 13:32:08 1/24/2002 APPLID STM4IRA1 Page 1

Tran/	Program/	#Tasks/	...........Average Elapsed Time...........					.....Average CPU Time.....			.....Average Count.......			#Abends
SSID	Planname	#Threads	Response	Thread	In-DB2	DB2ConWt	DB2ThdWt	User	Thread	In-DB2	DB2Reqs	GetPage	SysPgUpd	
WRCI	CRWWPPCI	10	.1085			.0000	.0000	.001112			1.0			0
CH1G	CRWWPPCI	6		5.4859	.0037				.000439	.000327		3.0	.0	
WRDF	CRWWPPDF	9	1.2535			.0000	.0000	.006832			46.0			0
CH1G	CRWWPPDF	5		6.5634	.9419				.006247	.004860		61.2	28.0	
WRDI	CRWWPPDI	3	.3111			.0000	.0000	.001578			4.0			0
CH1G	CRWWPPDI	2		12.1418	.2181				.000811	.000593		8.0	.0	
WRIT	CRWWPPIT	69	.1350			.0000	.0000	.001920			3.0			0
CH1G	CRWWPPIT	61		.9696	.0038				.001297	.001127		6.0	.0	
WRNO	CRWWPPNO	121	3.7267			.0000	.0000	.010867			67.0			0
CH1G	CRWWPPNO	110		4.5374	3.6016				.009893	.007788		149.8	38.3	
WROI	CRWWPPOI	45	3.2526			.0000	.0000	.002918			10.0			0
CH1G	CRWWPPOI	33		4.5092	2.2503				.002029	.001618		18.5	.0	

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WebSphere MQ Reports

- WebSphere MQ Reports ...
  - WebSphere MQ Accounting Data - SMF 116
    - Class 1 (Subtype 0), Class 3 (Subtypes 1 and 2) records
      - Accounting data for each task, at thread and queue level
  - List ...
    - Class 1, Class 3, ...
  - Summary ...
    - Class 1, Class 3, ...
    - Summarized by ...
      - CICS Transaction ID and/or MQ queue name
- Tailoring WebSphere MQ Reports
  - Queue Name, ...
    - Masking characters % and * are supported

WebSphere MQ Reports - Notes

The new CICS PA MQ reports use the WebSphere MQ Accounting data (SMF 116 records) to provide a detailed performance analysis of the CICS transactions that access an MQ queue manager.

The CICS PA MQ List reports provide a detailed trace of the WebSphere MQ accounting records, reporting the comprehensive performance data contained in the Class 1 (Subtype 0) and Class 3 (Subtypes 1 and 2) records. The MQ Summary reports provide, summarized by either CICS Transaction ID or by MQ queue name, an analysis of the MQ system and queue resources used and the transactions they service.

To produce the CICS PA MQ Reports, you need to accumulate WebSphere MQ Accounting statistics (SMF 116 records). CICS PA Version 2 Release 1 supports the WebSphere MQ Accounting statistics data from IBM WebSphere MQ for z/OS Version 5.3.1 and Version 6.

The WebSphere MQ SupportPac "MP1B: WebSphere MQ for z/OS V6.0 - Interpreting accounting and statistics data" provides information on the use and interpretation of the accounting and statistics available in WebSphere MQ for z/OS Version 5.3.1 and Version 6 and also provides information about the layout of the SMF records and suggests ways of analysing the data.

Integration with Tivoli OMEGAMON XE for CICS

- CICS PA Performance List and Summary reports …
  - CICS SMF 110 performance record extensions support
    - As defined to CICS by the OMEGCICS Event Monitoring Point
  - Third-party systems monitored by OMEGAMON ….
    - Adabas, CA-IDMS, CA-Datacom, Supra
  - Resource Limit Warnings …
    - DB2, DLI, VSAM, MQ, Adabas, CA-IDMS, CA-Datacom, Supra
    - CPU time, Elapsed time, DSA, EDSA, EXEC Calls, User Events
  - User work area
- Support for OMEGAMON XE for CICS SMF 112 records
  - CICS PA File and Transaction Resource Usage style reports …
    - Third-party systems monitored by OMEGAMON ….
      - Adabas, CA-IDMS, CA-Datacom, Supra
  - CICS PA Record Selection Extract …
    - Optionally include the OMEGAMON XE for CICS SMF 112 records

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Integration with Tivoli OMEGAMON XE for CICS

V1R4M0

CICS Performance Analyzer
Performance Summary

SUMM0001 Printed at 9:25:19 10/05/2006 Data from 16:41:03 9/18/2006 to 19:26:14 9/18/2006 Page 1
OMEGAMON Third Party Support - Summary

Tran	#Tasks	Avg IDMSREQ Time	Avg IDMSREQ Count	Avg ADABREQ Time	Avg ADABREQ Count	Avg SUPRREQ Time	Avg SUPRREQ Count	Avg DCOMREQ Time	Avg DCOMREQ Count	Avg USREVNT Time	Avg USREVNT Count
ADA3	6736	.0000	0	.0002	8	.0000	0	.0000	0	.0000	0
ADA4	16840	.0000	0	.0003	16	.0000	0	.0000	0	.0000	0
ADA5	3369	.0000	0	8.3947	7	.0000	0	.0000	0	.0000	0
ADA6	1	.0000	0	8.5790	8	.0000	0	.0000	0	.0000	0
DCO1	6736	.0000	0	.0000	0	.0000	0	.0026	15	.0000	0
IDM1	6736	.0026	10	.0000	0	.0000	0	.0000	0	.0000	0
OMEG	4	.0000	0	.0000	0	.0000	0	.0000	0	.0000	0
SUP1	10104	.0000	0	.0000	0	.0029	11	.0000	0	.0000	0
Total	50526	.0004	1	.5601	6	.0006	2	.0003	1	.0000	0

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OMEGAMON Reports …

```
MVS2CTSO - [32 x 80]
  File  Systems  Options  Help

                      SAMPTEST - OMEGAMON Report
Command ===> _

CICS System Selection:                  Report Output:
 APPLID . . ________ +                   DDname . . . . . . . . . OMEG0001
 Image  . . ________ +                   Print Lines per Page . . ___  (1-255)
 Group  . . ________ +

Reports Required:                       Summary Options:
 _  List                                 /  Average       _  Total
 /  Summary                              _  Minimum       /  Maximum
    /  By Transaction                    _  Deviation
    /  By Database                       _  Peak . .  90   (50-100%)

Statistics to include:                  DBMS Selection:
 /  Total DBMS activity                  /  Adabas        /  Supra
 /  Individual Database                  /  CA-Datacom    /  CA-IDMS

Report Format:
 Title  . . ____________________________________________
            ____________________________________________

Selection Criteria:
 _  Performance

MA      d                                                             04/015
```

Select the Reports required: List and/or Summary; and the level of report content detail required

OMEGAMON Reports …

```
V2R1M0                                  CICS Performance Analyzer
                                  OMEGAMON - CA-Datacom Transaction Summary

OMEG0001 Printed at 11:18:30  1/24/2007    Data from 23:01:08 18/09/2006 to 23:14:10 18/09/2006                    Page       2

    #Tasks   Database              Add     Count   Delete  Get Next  Get Set Loc Spec   Read    Release  Select   Sel Set  Update
    -------- --------  ---------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
           2 TBL000    Elapse Avg 15.4665   .9830   .8192   .8192  2.7197   .1311   .2621   .1638   .0983   .0983   .0983
                                  Max 15.9252   .9830   .9830   .9830  4.2598   .1966   .3932   .2621   .1311   .1311   .1311
                       Count  Avg       1       1       1       1       1       1       1       1       1       1       1
                              Max       1       1       1       1       1       1       1       1       1       1       1

    #Tasks   Database              Add     Count   Delete  Get Next  Get Set Loc Spec   Read    Release  Select   Sel Set  Update
    -------- --------  ---------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
           2 TBL001    Elapse Avg  .0328   .0000   .0000   .0000   .0000   .0000   .0000   .0328   .0000   .0000   .0000
                                  Max  .0655   .0000   .0000   .0000   .0000   .0000   .0000   .0655   .0000   .0000   .0000
                       Count  Avg       1       1       1       1       1       1       1       1       1       1       1
                              Max       1       1       1       1       1       1       1       1       1       1       1

.....
.....
.....

    #Tasks   Database              Add     Count   Delete  Get Next  Get Set Loc Spec   Read    Release  Select   Sel Set  Update
    -------- --------  ---------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
           4 TBL999    Elapse Avg 21.7907   .8192   .4751   .4915  2.0316   .0819   .0983   .2949   .0819   .0819   .0819
                                  Max 43.5159  2.4904  1.0486  1.1796  4.3909   .1966   .2621   .9830   .1966   .1966   .1966
                       Count  Avg       1       1       1       1       1       1       1       1       1       1       1
                              Max       1       1       1       1       1       1       1       1       1       1       1

    #Tasks   Database              Add     Count   Delete  Get Next  Get Set Loc Spec   Read    Release  Select   Sel Set  Update
    -------- --------  ---------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
        2984 *Total*   Elapse Avg  7.4255   .2357   .2646   .2624   .8060   .0699   .0670   .0732   .0760   .0784   .1070
                                  Max 249.4300  3.3423 44.4989  3.6700 21.2992 48.1034 12.4518 46.3340 42.2707 53.8706 68.6162
                       Count  Avg       1       1       1       1       1       1       1       1       1       1       1
                              Max       1       1       1       1       1       1       1       1       1       1       1
```


z/OS System Logger Reports

- System Logger Reports
  - SMF 88 Records …
    - Subtype 1 (Logstream Usage) and Subtype 11 (ALTER)
  - List and Summary by Logstream Name
  - Summary by Structure Name
  - List Structure ALTER events
- More extensive and flexible System Logger reporting
  - Alternative to the IXGRPT1 sample program
- Tailoring System Logger Reports
  - Logstream Name, Structure Name, ...
    - Masking characters % and * are supported
  - Selection Criteria
    - Including time range or individual field values
      - Allows poorly performing Logstreams to be more easily identified

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z/OS System Logger Reports – Notes

The CICS PA z/OS System Logger reports process the System Logger (SMF 88) records to provide information on the System Logger logstreams and coupling facility structures that are used by CICS Transaction Server for logging, recovery and backout operations.

The CICS PA z/OS System Logger reports, when used in conjunction with the CICS Logger reports produced by the standard CICS statistics reporting utilities, such as DFHSTUP, provide a comprehensive analysis of the logstream activity for all your CICS systems and provide a more extensive and flexible performance reporting solution than the IXGRPT1 sample program.

You can request a List report and/or a Summary report. The System Logger List report shows information on Logstream writes, deletes, and events (Subtype 1), as well as Structure Alter events (Subtype 11) for each SMF recording interval. Structure Alter events apply to Structures, not individual Logstreams, and are reported with a Logstream name of *ALTER*. The report can be sorted either on Logstream name or Structure name and/or by Time.

The System Logger (SMF 88) records can be filtered by Logstream and/or Structure name patterns; masking characters % and * are also supported. You can also use selection criteria to filter records by time range or individual field values which allows you to identify poorly performing Logstreams more easily.

The System Logger Summary report summarizes Logstream and Structure statistics so that you can measure Logger performance over a longer period of time.

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z/OS System Logger Reports – Logstream Summary

```
 V1R2M0                                          CICS Performance Analyzer
                                             System Logger - Logstream Summary

LOGR0001 Printed at 16:10:07  2/13/2002     Data from 22:55:00:00  1/05/2002 to 23:55:00:00  1/05/2002                Page      61

Logstream name              MVSID  Structure name          First interval start    Last interval stop      Total Interval
IYOT1.DFHLOG                 SYSD  LOG_JG_20M              23:00:00.00  1/05/2002  23:46:22.38  1/05/2002      0000:46:22
```

	IXGWRITES Count	IXGWRITES Total Bytes	IXGWRITES Average Bytes	Bytes Writn to Interim Storage	DELETIONS Count With DASD Write	DELETIONS Count Without DASD Write	DELETIONS Bytes After Offload w. DASD	DELETIONS Bytes Int Stor w/o DASD Write
Total	628147	172706K	275	301535K	216244	467717	59484K	128572K
Rate(/Sec)	225	62080		108388	77	168	21382	46216
Minimum	4	4292		4864	0	0	0	0
Maximum	94200	25898K		45218K	32740	71810	9004730	19739K

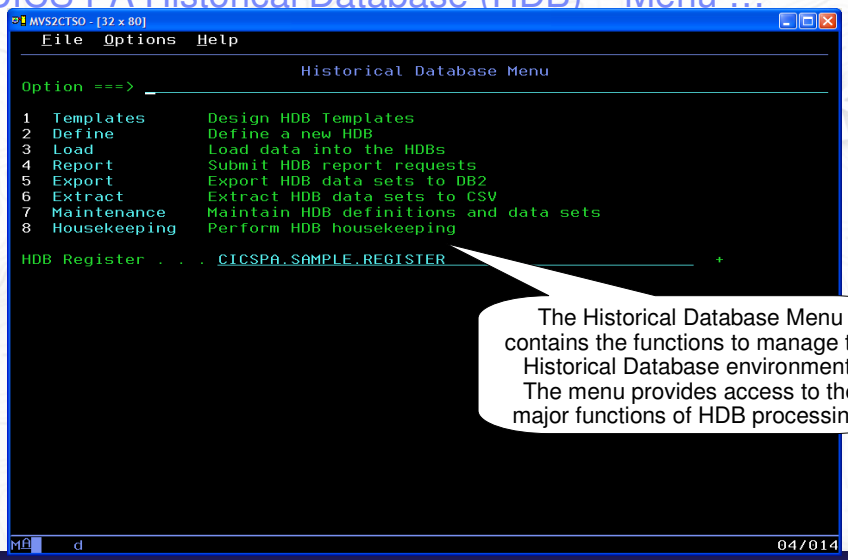
	EVENTS Offloads	Staging Threshld	Demand DASD Shifts	Block Length	Staging Full	Entry Full	Struct Full	Demand Init'd Offloads
Total	314	0	78		0	0	0	0
Rate(/Sec)	0	0	0		0	0	0	0
Minimum	0	0	0	116	0	0	0	0
Maximum	48	0	12	1427	0	0	0	0

	EVENTS Type1	EVENTS Type2	EVENTS Type3	EVENTS Struct Rebuilds Init'd	EVENTS Struct Rebuilds Complt'd	DASD Writes Count	DASD Writes Total Bytes	DASD Writes Average	DASD Writes Waits
Total	612865	15277	5	0	0	551	68133K	0	315
Rate(/Sec)	220	5	0	0	0	0	24491		0
Minimum	4	0	0	0	0	0	0		0
Maximum	91995	2458	5	0	0	84	10314K		48

CICS PA Historical Database (HDB)

- Flexible and easy-to-use facility for collecting and managing historical performance and statistics data for your CICS systems
- The CICS PA history database (HDB) function provides ...
  - Short term history data detailing individual transaction performance for use in performance problem analysis
  - Long term history data summarized over time that can be used for trend analysis, capacity planning and accounting purposes
  - Statistics history data for performance analysis and reporting purposes
  - Powerful and flexible definition facility for historical data repositories based on Report Forms
  - Comprehensive reporting facilities
  - Export history data to a DB2 table or into a CSV format data set
  - Definition and management of the historical databases (HDBs) from the CICS PA ISPF dialog
- Performance analysis, trending, and capacity planning

CICS PA Historical Database (HDB) – Menu ...



The Historical Database Menu contains the functions to manage the Historical Database environment. The menu provides access to the major functions of HDB processing.

CICS PA Historical Database - Notes

The Historical Database Menu contains the functions to manage the Historical Database environment. The menu provides access to the eight major functions of HDB processing.

The HDB Register dataset is the inventory of all information associated with the CICS PA Historical Database Manager. The HDB register contains the following information:-

- HDB Templates
- HDB Definitions, including the dataset definitions for HDB repositories (containers)
- Selection Criteria
- Object Lists
- Container data set information
- Load audit records
- Shared System definitions.

You can define as many HDB Registers as required; however only one Register can be used at a time and each Register acts independently. Information cannot be shared between Registers.

CICS PA Historical Database – HDB Template

- HDB Templates define the type and format of the performance data in the Historical Databases (HDBs)
- Similar to Report Forms, they provide HDBs with ...
  - Flexibility ...
    - you decide what and how much information is recorded in the HDB
  - Ease of use ...
    - the editor provides a simple way of tailoring the template
  - Transparency ...
    - you can see at a glance what information is recorded in the HDB
- Each Template contains the following definition information about the HDB ...
  - Type of HDB - List or Summary
  - Field names and associated attributes

CICS PA Historical Database – HDB Template - Notes

CICS PA HDB Templates define the type and format of the performance data in the Historical Database (HDB). HDB Templates apply to List and Summary type HDBs and are similar to Report Forms and provide HDBs with:-

- Flexibility - you decide what and how much information is recorded in the HDB
- Ease of use - the editor provides a simple way of tailoring the template
- Transparency - you can see at a glance what information is recorded in the HDB.

Each Template contains information on the type of HDB (List or Summary), along with the field names and their associated attributes.

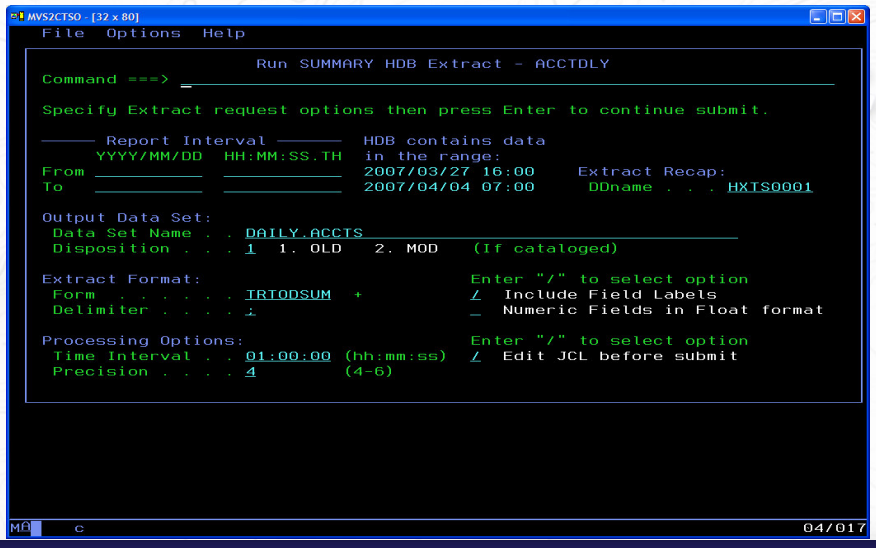
When you request a new Template, a table of the CMF fields is presented (shown on the next slide) that you can then edit. The HDB Template initially consists of 2 sections:-

1. The top section of the Template shows the fields in the default HDB template. The 'EOD' marker defines the end of the historical database record, fields below the 'EOD' marker are not included in the records.
2. To include any of these fields in the HDB records, simply move them above the 'EOD' marker, and remove any unwanted fields.

CICS PA Historical Database - Functions ...

- Load ...
  - Creates the JCL that builds the HDBs
    - HDB Load requests can also be requested in a Report Set
  - HDB Load Audit
    - Verify that load requests have completed, Highlight data gaps, …
- Report ...
  - Generates the Report JCL for HDBs, options include …
    - Report Form, Report Interval date/time selection, …
- Export an HDB data set to DB2 ...
  - Creates the DDL to define the DB2 Table
  - Generates the JCL to load an HDB into a DB2 Table
- Extract an HDB to CSV data set …
  - Generates the JCL to extract an HDB into CSV format data set
    - Allows analysis of both CICS Monitoring and CICS Statistics historical data off-host using PC spreadsheet or database tools

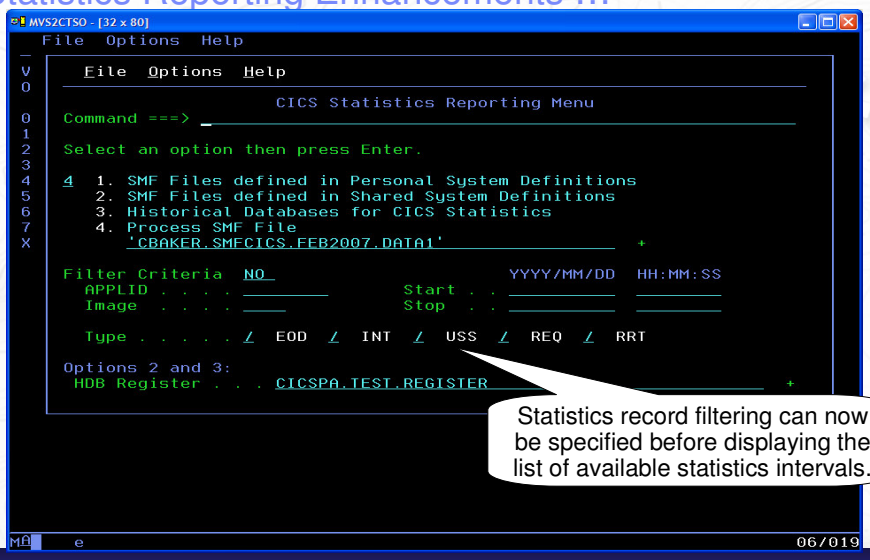
CICS PA Historical Database – Extract to CSV



CICS Statistics and CICS Server Statistics Support

- CICS PA provides comprehensive reporting and analysis of CICS statistics and CICS server statistics data
- The CICS PA Statistics online reporter provides reporting of CICS Statistics data …
  - Directly from an unloaded SMF data set or a CICS PA HDB
  - The reporting facility has QMF-like features; including …
    - Tabular reporting, Sorting by field (column), …
    - Forms to design personalized reports
    - Print facility (to a data set or to SYSOUT)
- CICS Statistics data can also be collected into a CICS PA Historical Database (HDB)
  - Facilities to Export to a DB2 table or Extract to a CSV file
  - Historical statistics data can also be reported using online reporting
- Supported for CICS Transaction Server V2.2 or later

Statistics Reporting Enhancements …



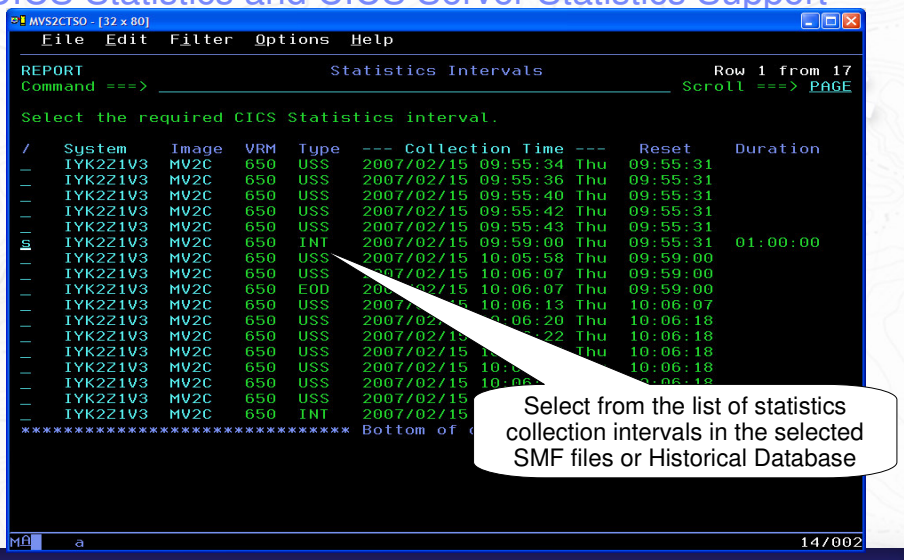
CICS Statistics - Notes

The previous slide showed an example of the CICS Statistics Online Reporting Menu where we selected option 4, Process SMF file. This option allows you to view and/or print the selected statistics interval or just a subset of the statistics data collected in the interval.

The CICS Statistics Online Reporting Menu allows you to select the statistics data from an SMF data set from your personal or shared system definitions, from a CICS PA Historical Database (HDB), or from any unloaded SMF data set.

The next slide shows the selected Statistics Interval and the type of data that was collected in that interval. From this panel you can either view or print the selected statistics data.

CICS Statistics and CICS Server Statistics Support

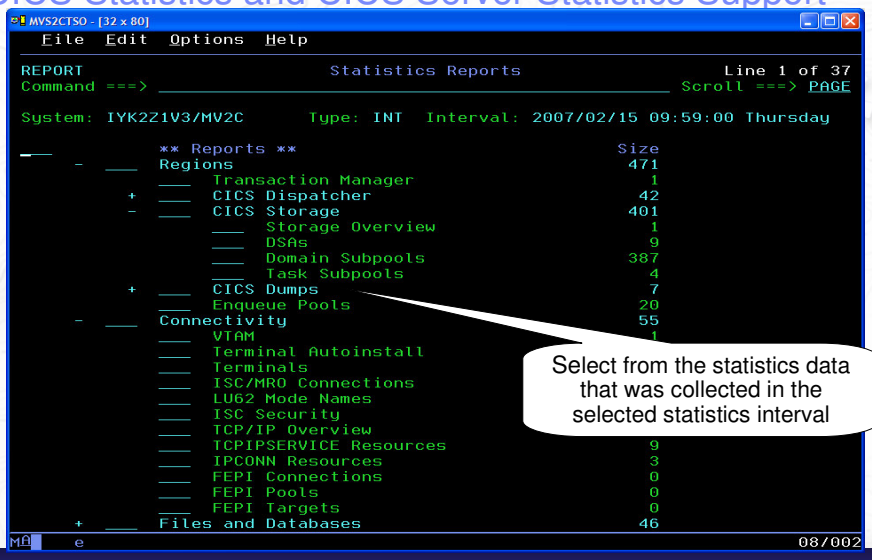


CICS Statistics - Notes

The previous slide shows the statistics data that is available in the interval that we selected from the unloaded SMF data set. From this panel you can either view the selected data, customize the report layout, or print the selected statistics data.

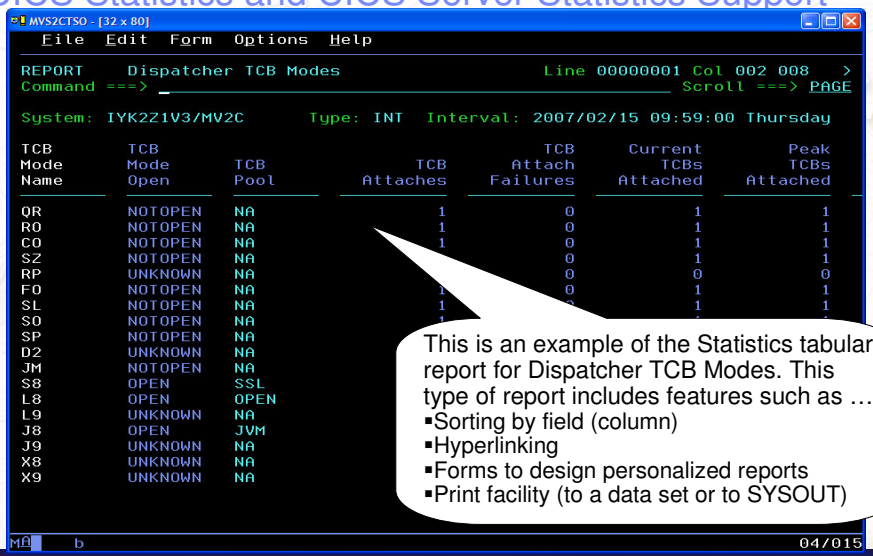
The next slide shows the selected Statistics Interval and the statistics data that was collected by the statistics interval. The data is shown by category, you can expand or collapse each category group, print the entire interval, or print a subset of the interval either by category or by a specific statistics record type.

CICS Statistics and CICS Server Statistics Support



Select from the statistics data that was collected in the selected statistics interval

CICS Statistics and CICS Server Statistics Support



This is an example of the Statistics tabular report for Dispatcher TCB Modes. This type of report includes features such as …

- Sorting by field (column)
- Hyperlinking
- Forms to design personalized reports
- Print facility (to a data set or to SYSOUT)

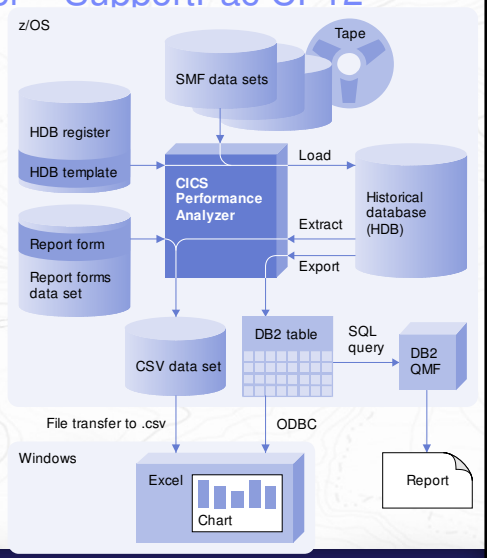
CICS Performance Analyzer – SupportPac CP12

- SupportPac CP12 – Historical Database Reporting
  - Reporting using DB2 / Exporting data for use in PC based applications
  - Introduction to CICS PA HDBs
  - Step-by-step procedure …
    - From SMF to HDB
      - Define Template, Define HDB, HDB Load, …
    - From HDB to DB2 or CSV
      - Export and Extract, …
  - Example scenarios and custom reports …
    - Are we meeting service-level agreements?
    - Why is a transaction slow?
    - Tuning LSR buffer pools

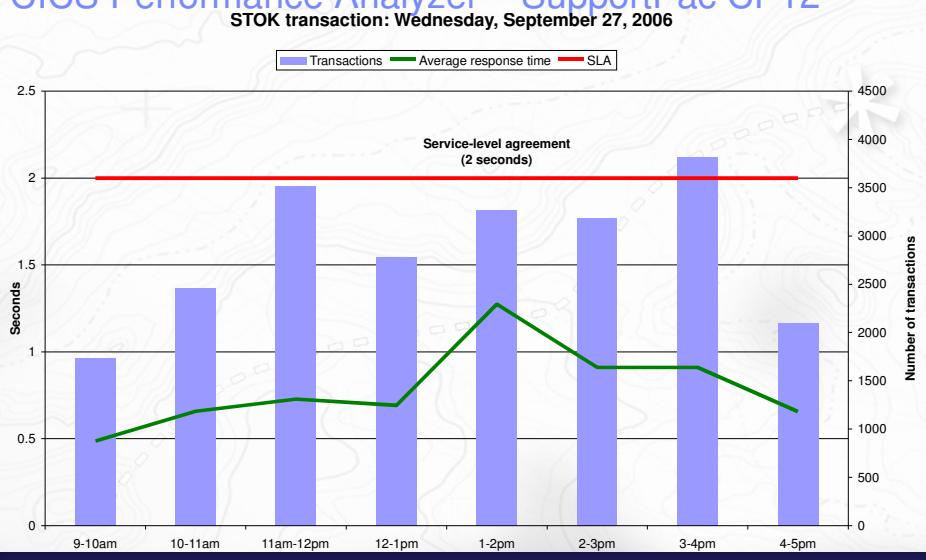
CICS Performance Analyzer – SupportPac CP12

HDB Reporting …

- Step-by-step procedure …
  - From SMF to HDB
  - From HDB to DB2 or CSV
- Reporting Tools …
  - QMF and Excel
- Example Scenarios
- Custom Reports
- Automating Tasks



CICS Performance Analyzer – SupportPac CP12



Summary

- CICS Performance Analyzer for z/OS
  - Comprehensive Performance Reporting for CICS
    - CICS Monitoring Facility (CMF) and CICS Statistics SMF 110 data
    - Including SMF data from …
      - DB2, WebSphere MQ, OMEGAMON XE for CICS, z/OS System Logger
  - Extensive Tabular Reports and Extract Data Sets
  - Historical Database
    - Trending, Capacity Planning and Accounting
  - Statistics Online Reporter
- CICS PA Version 2.1 …
  - Program Product – 5697-N40
  - Releases Supported ...
    - CICS Transaction Server for z/OS, Version 3 and Version 2
  - More Information ....
    - http://www.ibm.com/cics/

References

CICS Performance Analyzer for z/OS User's Guide, SC34-6799
CICS Performance Analyzer for z/OS Report Reference, SC34-6800

CICS Resource Definition Guide, SC34-6815
CICS Performance Guide, SC34-6833

IBM Tivoli OMEGAMON II for CICS Configuration and Customization Guide, GC32-1981

z/OS V1R8.0 MVS System Management Facilities (SMF), SA22-7630

Redbooks:

CICS Performance Analyzer, SG24-6063
Migration Considerations for CICS Using CICS CM, PA and IA, SG24-7294

Systems Programmer's Guide to: z/OS System Logger, SG24-6898

Redpapers:

Performance Considerations and Measurements for CICS and System Logger, REDP-3768

Questions
and
Answers