



# How To Use The Performance Toolkit To Generate Usable Reports

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# Agenda

- Report generating capabilities of The Performance Toolkit
- How do I generate reports?
- What reports do I use to gather specific information?
- Some tips on making sense of monitor data with charts and graphs

## Overview: The Performance Toolkit

- The Performance Toolkit is a pre-installed, optional feature of z/VM used to collect and process MONITOR data captured by the Control Program (CP).
  - Provides a real-time look at current system performance.
  - Processes data collected over time into reports to help determine normal system behavior and identify performance problems.

# Report generating capabilities of The Performance Toolkit

- MONITOR - onscreen live system data
- PRINT – printed live system data
- MONSCAN – onscreen from saved data
- FCONXREP – printed summary reports from saved data
- TRNDSCAN – summary data is displayed from saved data
- BATCH – printed reports from saved data
- Benchmarking – collects performance data for a specific subset of objects (users, I/O devices, ISFC endpoints, and ISFC logical links)

# Data Sources for Reports

- Live monitor data
- History files
  - ***mmdyy HISTLOGn*** – contains most of the performance data available in ‘by time’ logs.
- Trend files
  - ***systemid FCXTREND*** – cumulative file with more detailed information on system load, processors, users, disks, and channels.
- Summary files
  - ***ACUM HISTSUM*** – summary history data
  - ***systemid FCXSUMn*** – extended summary data for a single ‘summary’ period.
- Monitor data files
  - ***Dmmdyy Thhmmss*** – complete monitor data, generated by MONWRITE command

## How do I generate reports?

- Different commands and data sources are used to generate reports.
- Some reports can be created from the PERFSVM userid. Other reports should be created from other userids with access to monitor data using PerfKit utilities and commands.

# MONITOR Command

- The MONITOR command switches Performance Toolkit into performance monitoring mode, where you can view real-time monitor data by selecting from a menu of report screens.

```

FCX124          Performance Screen Selection (FL620          )          Perf. Monitor

General System Data          I/O Data          History Data (by Time)
1. CPU load and trans.      11. Channel load      31. Graphics selection
2. Storage utilization      12. Control units     32. History data files*
3. SSI data menu*          13. I/O device load*  33. Benchmark displays*
4. Priv. operations        14. CP owned disks*   34. Correlation coeff.
5. System counters         15. Cache extend. func.* 35. System summary*
6. CP IUCV services        16. Reserved          36. Auxiliary storage
7. SPOOL file display*     17. DASD seek distance* 37. CP communications*
8. LPAR data               18. I/O prior. queueing* 38. DASD load
9. Shared segments         19. I/O configuration  39. Minidisk cache*
A. Shared data spaces      1A. I/O config. changes 3A. Storage mgmt. data*
B. Virt. disks in stor.    21. User resource usage* 3B. Proc. load & config*
C. Transact. statistics    22. User paging load*   3C. Logical part. load
D. Monitor data           23. User wait states*   3D. Response time (all)*
E. Monitor settings       24. User response time* 3E. RSK data menu*
F. System settings        25. Resources/transact.* 3F. Scheduler queues
G. System configuration    26. User communication* 3G. Scheduler data
H. VM Resource Manager     3H. SFS/BFS logs menu*  3I. System log

Select performance screen with cursor and hit ENTER
Command ==> _
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
  
```



## MONITOR Command (continued)

- The AVERAGE command will change the contents of a report from data obtained in the current interval (60 seconds by default) to the average value of the data over the whole period where performance data were collected or since the time when they were last reset.
- The CURRENT command will cause Performance Toolkit to resume showing values from the last monitor sample interval.
- The MONITOR command can be issued from PERFSVM and/or a user connecting to PERFSVM through the APPC interface.

# PRINT Command

- The PRINT command, used while in Monitor Mode, prints an individual or a collection of PerfKit reports, either to disk or virtual printer.
- Examples:
  - **PRINT CPU** - prints the CPU display to the virtual printer of PERFSVM. Until the spool file is closed (CLOSE 00E), subsequent executions of the PRINT command will append the data to existing spool file.
  - **PRINT ON DISK** – continuously prints the data from any display you view to disk file FCOMMON LISTING A. The contents of the print file is cumulative and will continue to be saved until you issue the PRINT OFF command.



# Output of PRINT Command

```

FCX100  Run 2013/07/22 11:47:13          CPU
                                           General CPU Load and User Transactions

From 2013/07/22 11:46:13
To    2013/07/22 11:47:13
For   60 Secs 00:01:00                  This is a performance report for system XYZ
  
```

---

```

CPU Load                                     Status or
PROC TYPE %CPU %CP %EMU %WT %SYS %SP %SIC %LOGLD ded. User
P00 CP      0   0   0 100   0   0   99   0 Master

Total SSCH/RSCH      2/s      Page rate      .0/s      Priv. instruct.      8/s
Virtual I/O rate    0/s      XSTORE paging  .0/s      Diagnose instr.     8/s
Total rel. SHARE      0      Tot. abs SHARE    0%

Queue Statistics:      Q0      Q1      Q2      Q3      User Status:
VMDBKs in queue      0      0      0      0      # of logged on users  13
VMDBKs loading       0      0      0      0      # of dialed users     0
Eligible VMDBKs           0      0      0      0      # of active users     4
El. VMDBKs loading           0      0      0      0      # of in-queue users   0
Tot. WS (pages)      0      0      0      0      % in-Q users in PGWAIT 0
Reserved                                     % in-Q users in IOWAIT 0
85% elapsed time    3.228    .538    4.304    25.82    % elig. (resource wait) 0

Transactions      Q-Disp      trivial      non-trv      User Extremes:
Average users      .0           .0           .0           Max. CPU %      .....
Trans. per sec.    .3           .0           .0           Reserved
Av. time (sec)    .103        .000        .000        Max. IO/sec    PERFSVM      .1
UP trans. time           .000        .000        Max. PGS/s     .....
MP trans. time           .000        .000        Max. RESPG    PERFSVM     1913
System ITR (trans. per sec. tot. CPU) 1546        Max. MDCIO     .....
Emul. ITR (trans. per sec. emul. CPU) 5667        Max. XSTORE    .....
  
```



# PRINT from APPC- or web-connected Userid

- The PRINT function will also work when issued from a user connected to PERFSVM through APPC while in MONITOR mode or a user logged in through the web interface. However:
  - **PRINT ON DISK** does not work.
  - **PRINT** or **PRINT *screen*** will result in a RDR file in PERFSVM's spool. Output from the PRINT command will not be cumulative (one spool file is generated per PRINT command). It is not necessary to issue the CLOSE 00E command.

## MONSCAN Command

- The MONSCAN commands allows you to select a monitor file on disk or tape created by the MONWRITE utility as input for performance data analysis (the MONWRITE utility will create the fileid for the input file as ***Dmddy Thhmmss***). This data will then be displayed on PerfKit screens as if it was live data.
  - You run MONSCAN from other userids by linking to PERFSVM's 201 disk. Enter MONSCAN from Performance Toolkit basic mode or preface the command with **PERFKIT**.

**MONSCAN DISK *fn ft fm* FROM *hh:mm*** or  
**PERFKIT MONSCAN DISK *fn ft fm* FROM *hh:mm***

- While in MONSCAN mode, move through the data by collection interval, time, or go to the last interval:
  - NEXTSAMP - go to the next sample interval
  - NEXTSAMP hh:mm - go to the data for the given time
  - NEXTSAMP EOF – go to the last interval

# MONSCAN Example

- MONSCAN D072213 T105449 X
- Select CPU screen
- NEXTSAMP to move forward through the saved intervals.

```

FCX100      Data for 2013/07/22  Interval 10:56:49 - 10:57:49  Monitor Scan

CPU Load
PROC TYPE %CPU %CP %EMU %WT %SYS %SP %SIC %LOGLD Status or
P00 CP      6   5   2  94   0   0  100   7  Master

Total SSCH/RSCH      2/s      Page rate      .0/s      Priv. instruct. 5088/s
Virtual I/O rate    1237/s      XSTORE paging .0/s      Diagnose instr. 2523/s
Total rel. SHARE    3100      Tot. abs SHARE 0%

Queue Statistics:      Q0      Q1      Q2      Q3      User Status:
VMDBKs in queue      1      0      0      1      # of logged on users 14
VMDBKs loading       0      0      0      0      # of dialed users 0
Eligible VMDBKs      0      0      0      0      # of active users 6
El. VMDBKs loading   0      0      0      0      # of in-queue users 2
Tot. WS (pages)      1013      0      0      200      % in-Q users in PGWAIT 0
Reserved
85% elapsed time     3.594      .599  4.792  28.75      % in-Q users in IOWAIT 47
                                     % elig. (resource wait) 0

Transactions      Q-Disp      trivial      non-trv      User Extremes:
Average users      .8      .2      .0      Max. CPU % TCPIP 2.5

Command ==>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
  
```

# FCONXREP

- FCONXREP is not run from the Performance Toolkit environment, but it is used to analyze the summary performance history data files (ACUM HISTSUM) and detailed history logs (HISTLOG) created by Performance Toolkit.
  - Produces a table with average load values for selected performance variables on an hourly, daily, monthly, and/or yearly basis.
  - Located on PERFSVM 201 disk
  - Runs in interactive or batch mode
    - Interactive mode displays a selection menu
    - Batch mode requires a configuration file, FCONXREP SETTINGS, to provide the selection criteria for the report
  - Generates a FCONXREP LISTING file and FCONXREP IMPORT file (with output suitable for importing to a PC application).

# FCONXREP Selection Menu for Summary Logs



```
FCX201          Perf. Toolkit Numerical Performance Analysis          Perf. Report

Period: Date      ==> 2013/07/11  to 2013/07/23    (YYYY/MM/DD)
      Time        ==> 08          to 17          (all hours in period)
      Sel. hours   ==>                               (only selected hours)
              ==>
      Sel. days    ==> M-F                               (only selected days)

Desired detail:  HOURS ==> TOT          (ALL or TOT)
                  DAYS  ==> ALL          (ALL or TOT)
                  MONTHS ==> ALL        (ALL or TOT)

Variable selection ==> CPU              % total CPU
                  ==> LOGN             Logged-on users
                  ==> ACT              Active users
                  ==> TR/S             Trivial trans./s
                  ==> NT/S            Non-triv trans/s
                  ==>
                  ==>
                  ==>

Processing file 'ACUM HISTSUM Z1' (new SUM format)

F1=Help  F2=Browse  F3=Quit  F5=XEDIT  F10=Execute  F12=Return
```





# FCONXREP LISTING example

Perf. Toolkit Statistics for Period 2013/07/11 to 2013/07/23, Hours to 2013/07/23, Hours 08 to 17

Input file: ACUM HISTSUM X1      Selected days: M-F

Year	Mon	Day	Hr	CPU	LOGN	ACT	TR/S	NT/S
			11	0.0	11	4	0.00	0.00
			12	0.0	11	4	0.00	0.00
			15	0.0	11	4	0.00	0.00
			16	0.0	11	4	0.00	0.00
			17	0.0	11	4	0.00	0.00
			18	0.0	11	4	0.00	0.00
			19	0.1	12	4	0.06	0.00
2013	Jul	TOT		0.0	11	4	0.01	0.00
							320	15
2013	TOT			0.0	11	4	0.01	0.00
Total				0.0	11	4	0.01	0.00

**Output from a  
summary  
history file.**

# FCONXREP Selection Menu for Detailed History Logs



```
FCX201      Perf. Toolkit Numerical Performance Analysis      Perf. Report
```

```
Processing a detailed history log file for a single day. Please specify the
period to be analyzed, the interval to be used for calculating subtotals,
and the variables that should be included in the report.
```

```
Start and end time ==> 08:00  to  17:00   (hh:mm)
```

```
Interval (minutes) ==> 30                (Range 1-120 minutes)
```

```
Variable selection ==> CPU                % total CPU
                    ==> PG/S             Total page rate
                    ==> C1ES            C11 time slice
                    ==> TR/S            Trivial trans./s
                    ==> NT/S            Non-triv trans/s
                    ==>
                    ==>
                    ==>
```

```
Processing file '20130722 HISTLOG Z1' (new LOG format)
```

```
F1=Help  F2=Browse  F3=Quit  F5=XEDIT  F10=Execute  F12=Return
```

# FCONXREP LISTING example

Perf. Toolkit Statistics for Detailed Log, 08:00 to 17:00

-----  
 Input file: 20130722 HISTLOG X1

Time	CPU	PG/S	C1ES	TR/S	NT/S
08:29	0.0	0.0	0.680	0.00	0.00
08:59	0.0	0.0	0.680	0.00	0.00
09:29	0.0	0.2	0.680	0.00	0.00
09:59	0.0	0.1	0.679	0.00	0.00
10:29	0.0	0.3	0.679	0.00	0.00
11:45	0.0	0.0	0.538	0.01	0.00
12:15	0.0	0.2	0.535	0.02	0.00
12:45	0.0	0.0	0.530	0.01	0.00
13:15	0.0	0.0	0.530	0.00	0.00
13:45	0.0	0.0	0.530	0.00	0.00
14:02	0.0	0.0	0.530	0.00	0.00
Total	0.0	0.1	0.602	0.00	0.00

**These represent statistics from a detailed history log.**

## TRNDSCAN Mode

- Data from extended trend data files can be browsed while in Trend File Scan Mode.
  - Cannot be run in virtual machine where active realtime monitoring takes place.
  - ‘Average’ data is shown for the period between two reset times at the beginning and end of the interval. The FCONTROL MONCOLL RESET command is used to define the interval and generate trend records.
  - Invoke with **PERFKIT TRNDSCAN *fn ft fm*** command, where the filename is the system id and filetype is FCXTREND.

# Trend Scan Mode Main Menu

FCX124                      Performance Screen Selection    (FL620                      )                      Trend Scan

General System Data	I/O Data	History Data (by Time)
1. CPU load and trans.	11. Channel load	31. Graphics selection
2. Storage utilization	12. Control units	32. History data files*
3. SSI data menu*	13. I/O device load*	33. Benchmark displays*
4. Priv. operations	14. CP owned disks*	34. Correlation coeff.
5. System counters	15. Cache extend. func.*	35. System summary*
6. CP IUCV services	16. Reserved	36. Auxiliary storage
7. SPOOL file display*	17. DASD seek distance*	37. CP communications*
8. LPAR data	18. I/O prior. queueing*	38. DASD load
9. Shared segments	19. I/O configuration	39. Minidisk cache*
A. Shared data spaces	1A. I/O config. changes	3A. Storage mgmt. data*
B. Virt. disks in stor.		3B. Proc. load & config*
C. Transact. statistics	User Data	3C. Logical part. load
D. Monitor data	21. User resource usage*	3D. Response time (all)*
E. Monitor settings	22. User paging load*	3E. RSK data menu*
F. System settings	23. User wait states*	3F. Scheduler queues
G. System configuration	24. User response time*	3G. Scheduler data
H. VM Resource Manager	25. Resources/transact.*	3H. SFS/BFS logs menu*
	26. User communication*	3I. System log

Command ===>

F1=Help    F4=Top    F5=Bot    F7=Bkwd    F8=Fwd    F12=Return

## Working in Trend Scan Mode

- Select screens in the same way you would in Monitor Mode.
- NEXTSAMP and SKIPSAMP commands allow you to view data for another period:
  - NEXTSAMP will let all the intermediate data be read and processed
  - SKIPSAMP will skip intermediate data records

# BATCH

- The Performance Toolkit BATCH command generates reports from monitor data files created by the MONWRITE utility.
  - Input files:
    - **BATCH MASTER**: parameter file which points to other files containing settings for the reports and identifying which reports to produce.
      - **fn SETTINGS** – set timeframe for reports, identify users or devices to benchmark, define output settings
      - **fn REPORTS** – lists the PerfKit reports to produce
  - Output file:
    - **fn LISTING A**

# BATCH input files

```
BATCH      MASTER  A1

00000 * * * Top of File * * *
00001 SETTINGS PAGE SETTINGS
00002 REPORTS PAGE REPORTS
00003 * * * End of File * * *
```

```
PAGE      SETTINGS A1

00000 * * * Top of File * * *
00001 FC MONCOLL RESET 00:00:00R_P 11:59:00P
00002 FC SET PAGESIZE OFF
00003 * * * End of File * * *
```

```
PAGE      REPORTS  A1

00000 * * * Top of File * * *
00001 PAGELOG
00002 * * * End of File * * *
```



## Using BATCH

- From a userid with access to the MONWRITE data file:
  - Create a MASTER, SETTINGS, and REPORTS file.
  - Link and access PERFSVM's 201
  - **PERFKIT BATCH *masterfn masterft masterfm* DISK *datafn dataft datafm***
- From the example on the previous page, if the MONWRITE data file is D070513 T195504 X, the command would be:
  - **PERFKIT BATCH BATCH MASTER A DISK D070513 T195504 X**
- The output file would be FCONX LISTING A and would contain a single report, the PAGELOG, for each interval between resets contained in the data.

# Example FCONX LISTING file



1FCXTOC Run 2013/07/22 16:04:50

Table of Contents  
PERFKIT Reports in Order of Appearance

Page i

From 2013/07/22 10:55:49  
To 2013/07/22 11:15:49  
For 1200 Secs 00:20:00

CPU 2098-Z05 SN 2CB92  
z/VM V.6.2.0 SLU 1101

Rpt ID Report Description

Page From Date/Time

To Date/Time

FCX143 Total Paging Activity, by Time

1 2013/07/22 10:55:49 - 2013/07/22 11:15:49

1FCX143 Run 2013/07/22 16:04:50

PAGELOG  
Total Paging Activity, by Time

Page 1

From 2013/07/22 10:55:49  
To 2013/07/22 11:15:49  
For 1200 Secs 00:20:00

VMSYS1  
CPU 2098-Z05 SN 2CB92  
z/VM V.6.2.0 SLU 1101

Interval	Paging Blocks	Expanded Storage					Fast-		Est. Page		DPA		Est.		Paging to DASD					Page Table	
		PGIN /s	Path %	PGOUT /s	Total /s	Life sec	Migr /s	Pagable Frames	Page Life	Reads /s	Write /s	Total /s	Shrd /s	Guest /s	System /s	Total /s	Reads /s	Writes /s			
>>Mean>>	0	.0	.0	.0	.0	....	.0	10641	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
10:56:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
10:57:49	0	.0	.0	.0	.0	....	.0	10641	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
10:58:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
10:59:49	0	.0	.0	.0	.0	....	.0	10636	....	.0	.0	.0	.5	.0	.0	.0	.0	.0			
11:00:49	0	.0	.0	.0	.0	....	.0	10641	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
11:01:49	0	.0	.0	.0	.0	....	.0	10639	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:02:49	0	.0	.0	.0	.0	....	.0	10641	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:03:49	0	.0	.0	.0	.0	....	.0	10641	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:04:49	0	.0	.0	.0	.0	....	.0	10640	....	.0	.0	.0	.5	.0	.0	.0	.0	.0			
11:05:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
11:06:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
11:07:49	0	.0	.0	.0	.0	....	.0	10644	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
11:08:49	0	.0	.0	.0	.0	....	.0	10644	....	.0	.0	.0	.4	.0	.0	.0	.0	.0			
11:09:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.5	.0	.0	.0	.0	.0			
11:10:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:11:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:12:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:13:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:14:49	0	.0	.0	.0	.0	....	.0	10642	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			
11:15:49	0	.0	.0	.0	.0	....	.0	10644	....	.0	.0	.0	.3	.0	.0	.0	.0	.0			



Complete your sessions evaluation online at [SHARE.org/BostonEval](http://SHARE.org/BostonEval)

# FCONTROL BENCHMRK

- Use the FCONTROL BENCHMRK subcommand to create individual ‘per sample’ logs for performance objects such as users, devices, ISFC endpoints, and ISFC logical links.
  - These logs can be displayed on the BENCHMRK Log Data screen (#33) and saved to a file if requested.
- An example of using FC BENCHMRK to monitor users:
  - From PERFSVM running PERFKIT in monitor mode:
    - FC BENCHMRK USER RESRCHOG
    - FC BENCHMRK USER RESHOG2

# BENCHMARK Log Data Example

- When benchmarking is turned on for these two users, the following logs are generated in the BENCHMARK Log Data screen:

```

FCX173      CPU 2098  SER 2CB92      BENCHMARK Log Data      Perf. Monitor

  Object      Log File
S ID          Name          Description
. RESHOG2     UCOMMLOG      User IUCV and VMCF communications log
. RESHOG2     UPAGELOG      User paging load log
. RESHOG2     URESPLOG      User response time log
. RESHOG2     USERLOG       User resource consumption log
. RESHOG2     USTATLOG      User wait state log
. RESHOG2     UTRANLOG      User resources per transaction log
. RESRCHOG    UCOMMLOG      User IUCV and VMCF communications log
. RESRCHOG    UPAGELOG      User paging load log
. RESRCHOG    URESPLOG      User response time log
. RESRCHOG    USERLOG       User resource consumption log
. RESRCHOG    USTATLOG      User wait state log
. RESRCHOG    UTRANLOG      User resources per transaction log

Select an object log with cursor and hit ENTER
Command ==> _
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
  
```

## What reports do I use to gather specific information?



- The components of any system are interdependent, which makes analyzing system performance more complicated than looking at one report or set of data.

The following charts provide suggestions for what reports are useful as a **starting point** for gathering and analyzing data for specific components of the system.

# General System Health

- **CPU load and trans screen (1. CPU).** Look for unusual (for your system) statistics.
- **System Summary Log screen (35. SYSSUMLG)** – shows a summary of system performance by time. Look for unusual spikes in fields like CPU % Busy or paging rates.

# Memory

- **CPU load and trans. screen (1. CPU)** - Page rate and XSTORE paging indicate current paging activity. Higher than normal activity may indicate memory constraint.
- **Storage Utilization (2. STORAGE)** – provides detailed main storage and XSTORE statistics.
- **Available List Log Screen (3A. AVAILLOG)** – tells how many storage frames are available by time. The “Times empty” columns indicate when CP is out of memory on its various free storage lists. Large values here are a sign of memory constraint.
- **Storage Management Logs Menu (3A. STORMENU)** – shows a list of all available ‘by time’ logs related to storage management. **STORLOG** and **PAGELOG** provide statistics to help you identify normal and ‘spiking’ situations.
- **CP owned disks (14. CPOWNED)** – check paging efficiency (Block Page Size should be > 10) and available paging space (Used %) here.
- **User wait states (23. USTAT)** - %PGW will identify users frequently in page wait.

# Processor

- **CPU load and trans. screen (1. CPU)** - %CPU (total processor utilization), %CP (CP utilization of the processor), and %EMU (virtual machine utilization of the processor) provide the current usage of all system CPUs.
- **User resource usage (21. USER)** – lets you see which users are using the most CPU.
- **Processor Load and Configuration Logs screen (3B – PROCMENU)** – shows the processor specific ‘by time’ logs. **PROCSUM** can be used to find CP overhead (T/V ratio close to 1.0 and a low SIE Intercepts / second to SIE Instructions / second ratio indicates low CP overhead.).



# I/O

- **CPU load and trans. screen (1. CPU)** – Total SSCH/RSCH and Virtual I/O rate indicates system I/O activity and virtual I/O activity.
- **I/O device load screen (13. DEVICE)** – displays I/O rates of devices. Individual devices can be selected for I/O Device Details Screen (**DEVICE devno**).
- **Channel load screen (11. CHANNEL)** – indicates which channels are experiencing channel busy conditions.

## USER

- **User Resource Screen (21. USER)** – provides a snapshot of running users resource consumption. **USER *userid*** or selecting the user from the screen will display the User Resource Details screen which contains general performance information for that user, CPU and I/O load of each virtual processor (if running virtual MP), virtual devices defined to the user, etc.
- **User Page Data Screen (22. UPAGE)** - shows paging by userid, including the number of pages resident and locked in memory, both above and below 2GB.

## USER (continued)

- **User wait states (23. USTAT)** – find out what users are waiting for what resources.
- **FCONTROL BENCHMRK *userid*** – use the FC BENCHMRK subcommand to select users for which ‘per sample’ logs are to be created. These logs can be viewed from the Benchmark displays (BENCHMRK) screen. They are useful for identifying baseline normal behavior and spotting spikes.

# Some tips on making sense of monitor data with charts and graphs

- The key to uncovering many chronic performance issues and to spot performance trends on your system is to look at monitor data from a graph or chart.
- Performance Toolkit itself has some graphics capabilities:
  - Graphical charts when used in conjunction with GDDM (most systems don't have this) on a 3270 emulator
  - Line graphics when used with the web browser interface
  - Simple plots (both web browser and 3270)
  - The ability to write data to a file in a way that makes it easy to import to pc-based graphics tools and spreadsheets.
  - Invoked with **GRAPHICS** subcommand or #31 from the main menu.

# Graphics Selection Menu

```

FCX128                               Graphics Selection Menu                               Perf. Monitor

General Specifications

Format           : PLOT
Data origin      : FILE 20130724 HISTLOG  A
Graphics type    : DETailed history
Selected period  : Last measurements
Selected hours   : 11:00 13:00
Selected days    : WEDNESDAY

Truncate X-var. at: _____
Y-var. cumulative (Y/N): N
Scatter plot (Y/N): Y

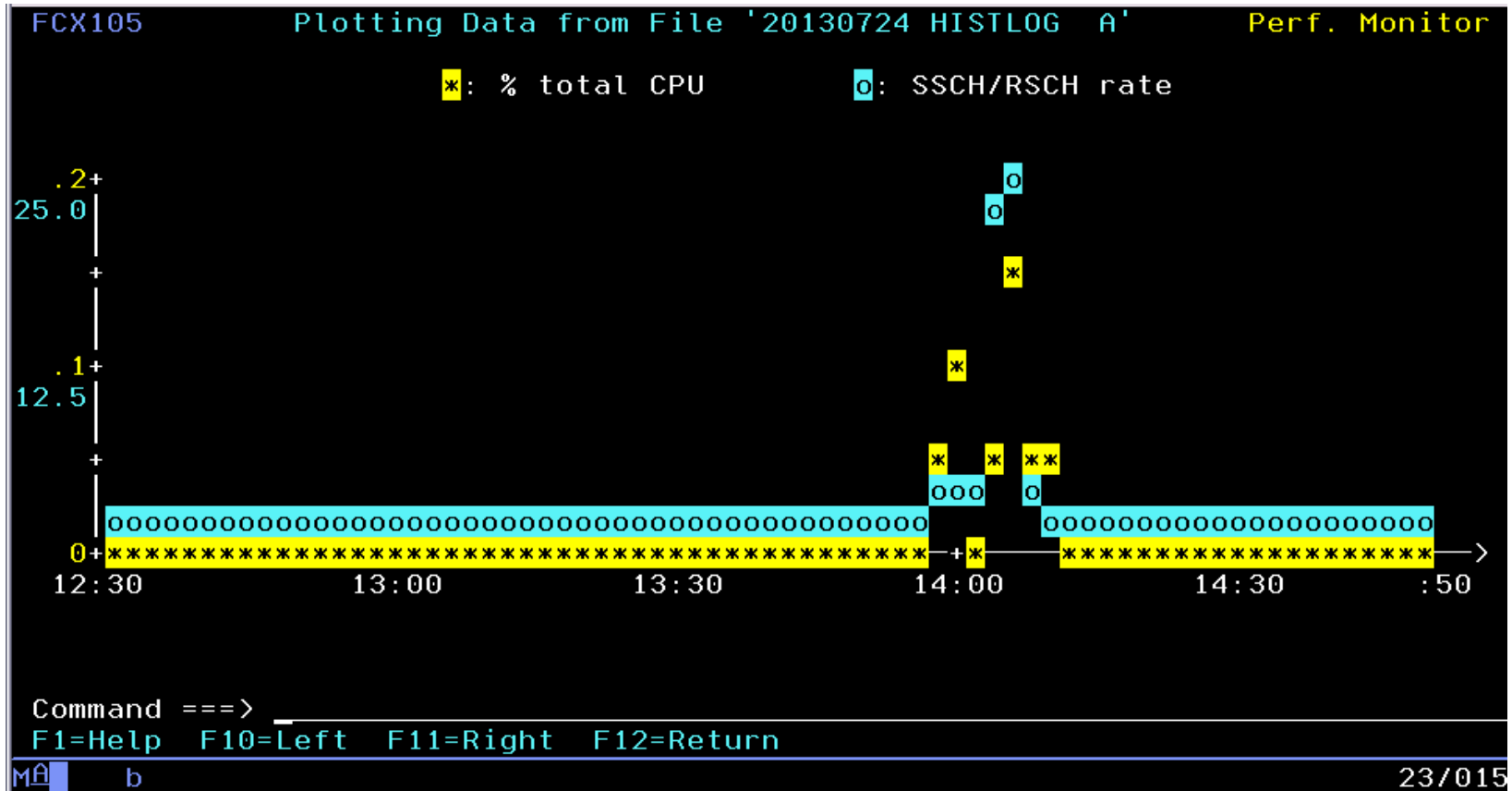
Variables Selection                                Trend Record Selection
Var  Name      Description                        Display  Record Details
X   : ACT      - Active users                    _____
Y   * : CPU     - % total CPU                      _____
   o : IO/S     - SSCH/RSCH rate                   _____
   = : _____ -                               _____
   / : _____ -                               _____

To select graphics

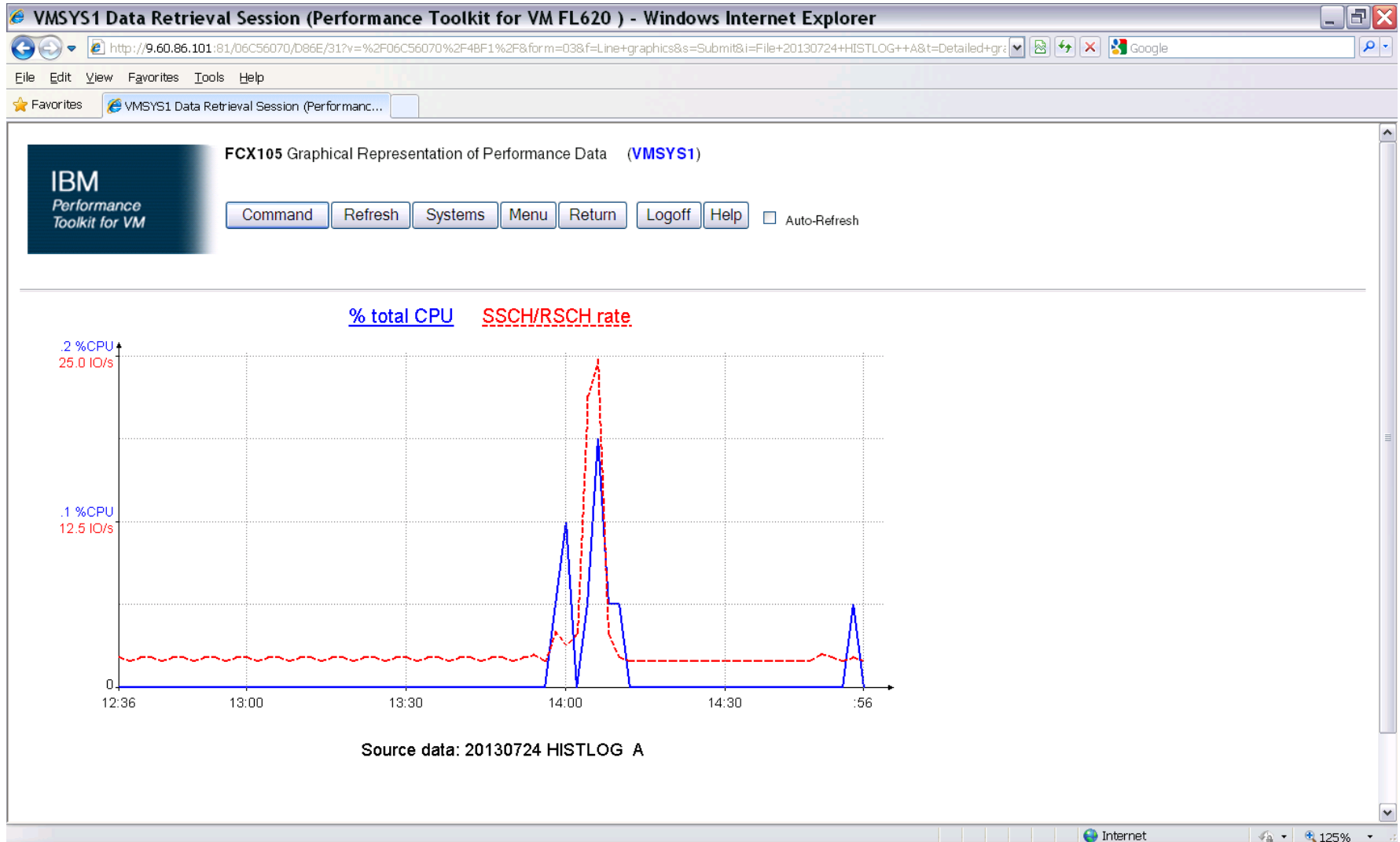
Command ==> _____
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
  
```

- This screen is designed to help you generate performance graphics based on history data (data origin FILE fn ft fm) or the current day's REDISP buffer (data origin STORAGE).

# 3270 Plot from Graphics Menu



# Graph from PerfKit Web Server



Complete your sessions evaluation online at [SHARE.org/BostonEval](http://SHARE.org/BostonEval)



# Write Graphical Data to File

```

FCX128                Graphics Selection Menu                Perf. Monitor

General Specifications

Format                : FILE
Data origin           : FILE 20130724 HISTLOG A
Graphics type        : DETailed history
Selected period      : Last measurements
Selected hours       : 11:00 13:00
Selected days        : WEDNESDAY

Truncate X-var. at:
Y-var. cumulative (Y/N): N
Scatter plot (Y/N): Y

Variables Selection          Trend Record Selection
Var  Name                   Description      Display  Record Details
X    : ACT                   - Active users   _____
Y    * : CPU                  - % total CPU   _____
     o : I/O/S                - SSCH/RSCH rate _____
     = : _____         - _____
     / : _____         - _____

To select graphics

Command ==>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
  
```

- This will create a file called FCONDATA IMPORT, which can be downloaded and imported in PC graphics programs.



# FCONDATA IMPORT



"Time	" "% total CPU	" "SSCH/RSCH rate "
"12:30	.0"	2.3"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.3"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"13:00	.0"	2.4"
"	.0"	2.0"
"	.0"	2.3"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.1"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.3"
"13:30	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.3"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.3"

"	.0"	2.3"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.4"
"	.0"	2.0"
"	.0"	2.4"
"	.0"	2.7"
"	.0"	2.1"
"	.0"	4.2"
"14:00	.1"	3.4"
"	.0"	4.1"
"	.0"	22.1"
"	.1"	24.9"
"	.0"	4.1"
"	.0"	2.3"
"	.0"	2.1"
"	.0"	2.1"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"14:30	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.0"
"	.0"	2.5"
"	.0"	2.7"

# Create Charts and Graphs from Printed Reports

- Whether you obtain a report on disk from the PRINT command or use the BATCH facility, the contents of that file can be easily imported to a PC graphics program or spreadsheet. LOG files are particularly helpful in identifying trends and performance problems.
- The following charts provide an example of using the log files generated by benchmarking a userid, USERLOG and USTATLOG, to get a visual sense of the behavior and performance of a user.

# Input Data: USERLOG



- FCX162 CPU 2098 SER 2CB92 Interval 12:01:00 - 00:00:00

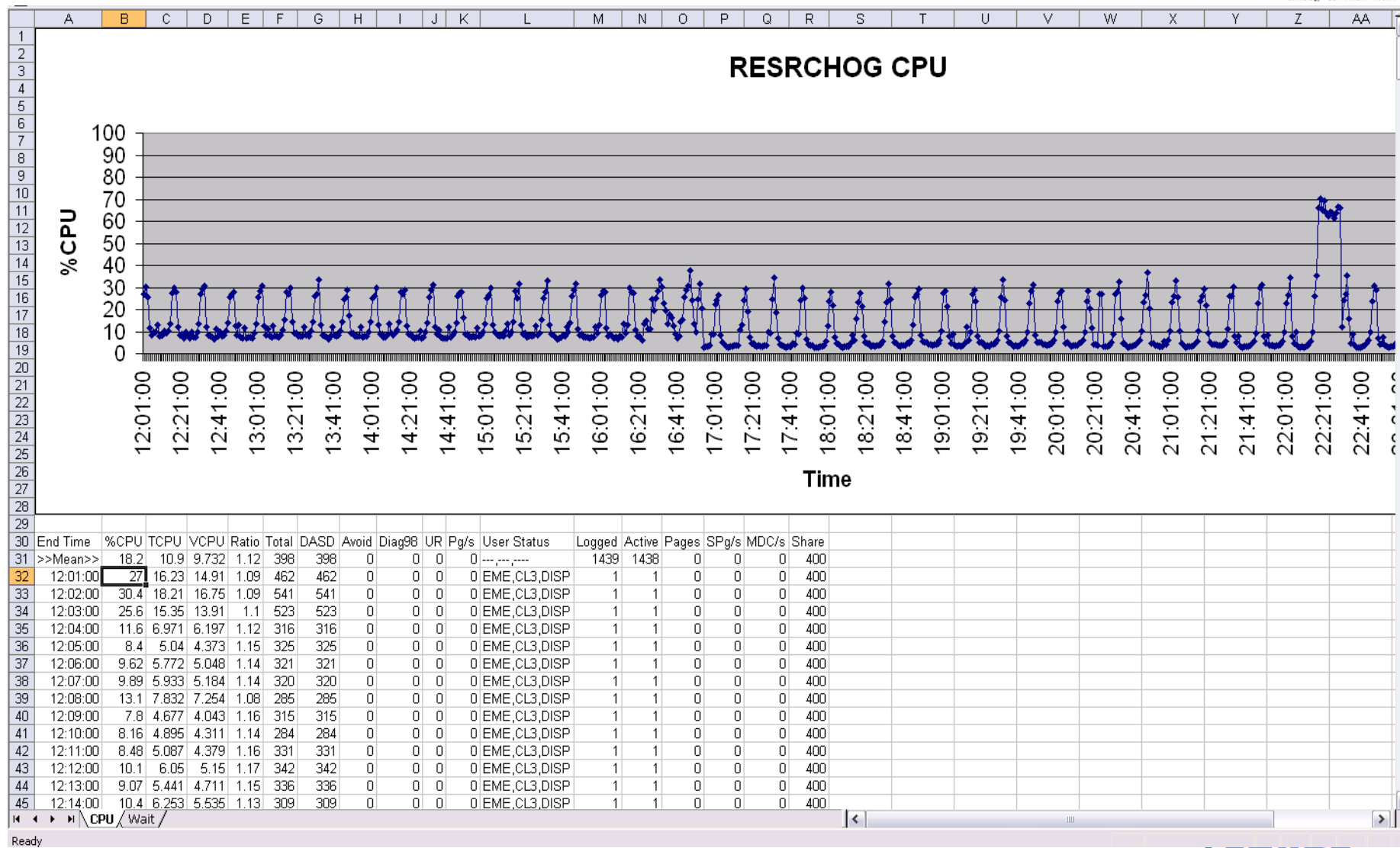
Resource Usage Log for User RESRCHOG

Interval	<----- CPU Load ----->				<----- Virtual IO/s ----->						<-User Time-->		<---Spool--->		MDC			
	<-Seconds->	T/V			Total	DASD	Avoid	Diag98	UR	Pg/s	User	Status	Logged	Active	Pages	SPg/s	MDC/s	Share
>>Mean>>	18.2	10.90	9.732	1.12	398	398	.0	.0	.0	.0	---	---	1439	1438	0	.00	.0	400
12:01:00	27.0	16.23	14.91	1.09	462	462	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:02:00	30.4	18.21	16.75	1.09	541	541	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:03:00	25.6	15.35	13.91	1.10	523	523	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:04:00	11.6	6.971	6.197	1.12	316	316	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:05:00	8.40	5.040	4.373	1.15	325	325	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:06:00	9.62	5.772	5.048	1.14	321	321	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:07:00	9.89	5.933	5.184	1.14	320	320	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:08:00	13.1	7.832	7.254	1.08	285	285	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:09:00	7.80	4.677	4.043	1.16	315	315	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:10:00	8.16	4.895	4.311	1.14	284	284	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:11:00	8.48	5.087	4.379	1.16	331	331	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:12:00	10.1	6.050	5.150	1.17	342	342	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:13:00	9.07	5.441	4.711	1.15	336	336	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:14:00	10.4	6.253	5.535	1.13	309	309	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:15:00	13.5	8.093	7.214	1.12	362	362	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:16:00	27.3	16.38	14.99	1.09	440	440	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:17:00	29.9	17.96	16.58	1.08	448	448	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:18:00	28.0	16.82	15.42	1.09	521	521	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:19:00	12.2	7.345	6.583	1.12	319	319	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:20:00	8.45	5.068	4.462	1.14	281	281	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:21:00	8.88	5.327	4.715	1.13	308	308	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:22:00	7.12	4.270	3.718	1.15	289	289	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:23:00	9.99	5.995	5.493	1.09	260	260	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:24:00	8.18	4.907	4.280	1.15	294	294	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:25:00	7.08	4.247	3.646	1.16	312	312	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:26:00	9.91	5.947	5.240	1.13	353	353	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:27:00	7.65	4.587	3.972	1.15	309	309	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:28:00	7.63	4.579	3.999	1.15	300	300	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:29:00	9.69	5.812	5.083	1.14	324	324	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	
12:30:00	13.4	8.029	7.104	1.13	379	379	.0	.0	.0	.0	EME,CL3,DISP	1	1	0	.00	.0	400	

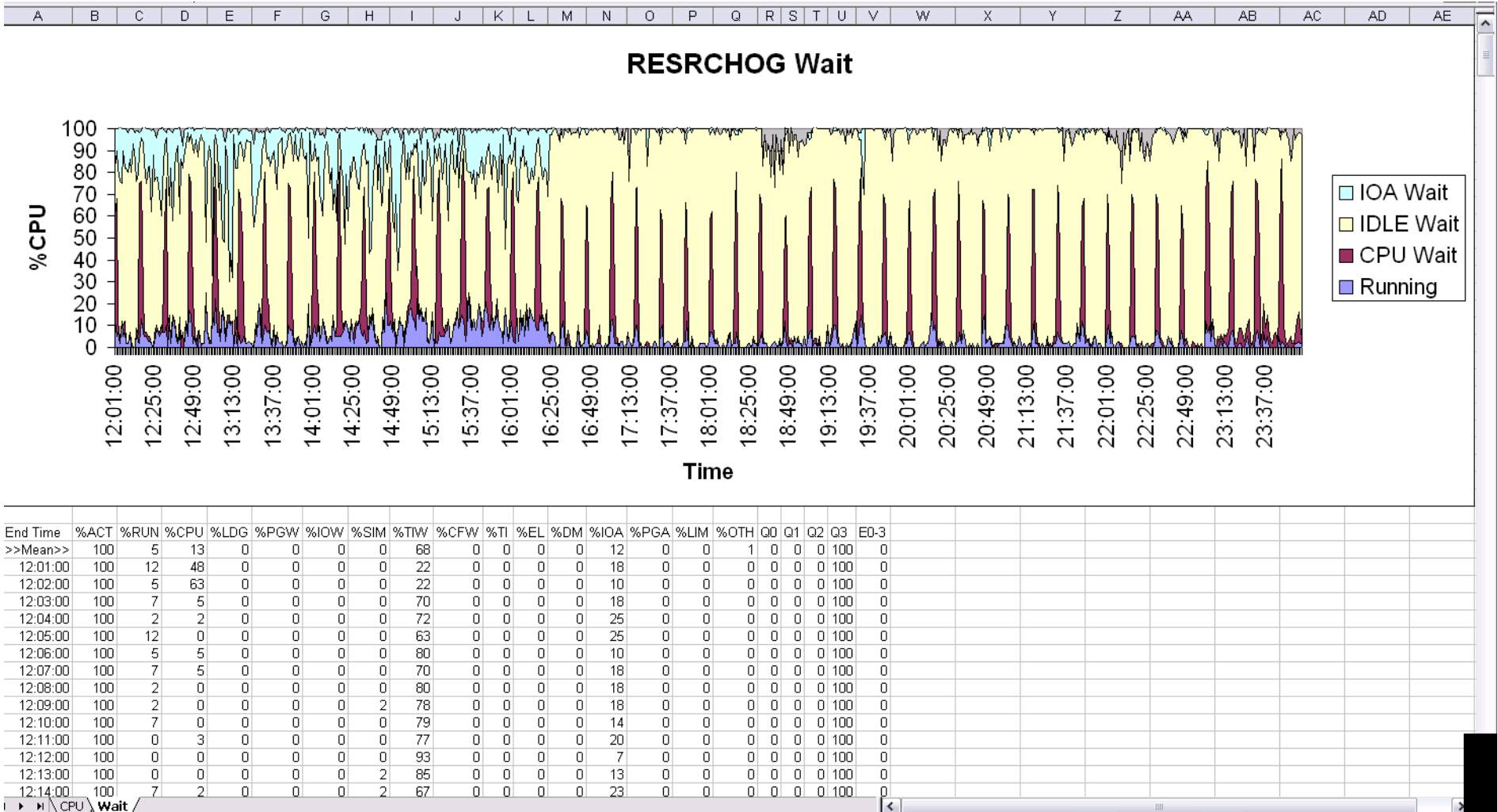


Complete your sessions evaluation online at [SHARE.org/BostonEval](http://SHARE.org/BostonEval)

# Data Imported to Spreadsheet



# Exported Data from USTATLOG report



# Summary

- The Performance Toolkit has a variety of ways to collect, display, and create reports for VM performance data.
  - Nearly 200 reports
  - Both 'live' and historical performance data is available for use
  - Most information can be found in more than one report
- Reports can be generated and viewed
  - Onscreen
  - In files
  - In graphics generated by Performance Toolkit or other applications importing Perfkit reports.