Using Free Tools to Analyze OpenVMS Performance

Wayne Sauer
President, PARSEC Group
sauer@parsec.com
www.parsec.com
888-4-PARSEC

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HP Technology Forum & Expo 2008

Topics

- Tuning Methodology
- The Data Collector (TDC)
- Enterprise Capacity Planner (ECP)
- T4
- And if we have time, we will discuss:
  - Monitor Utility
  - Accounting Utility
  - AUTOGEN Generated Files

Tuning Methodology

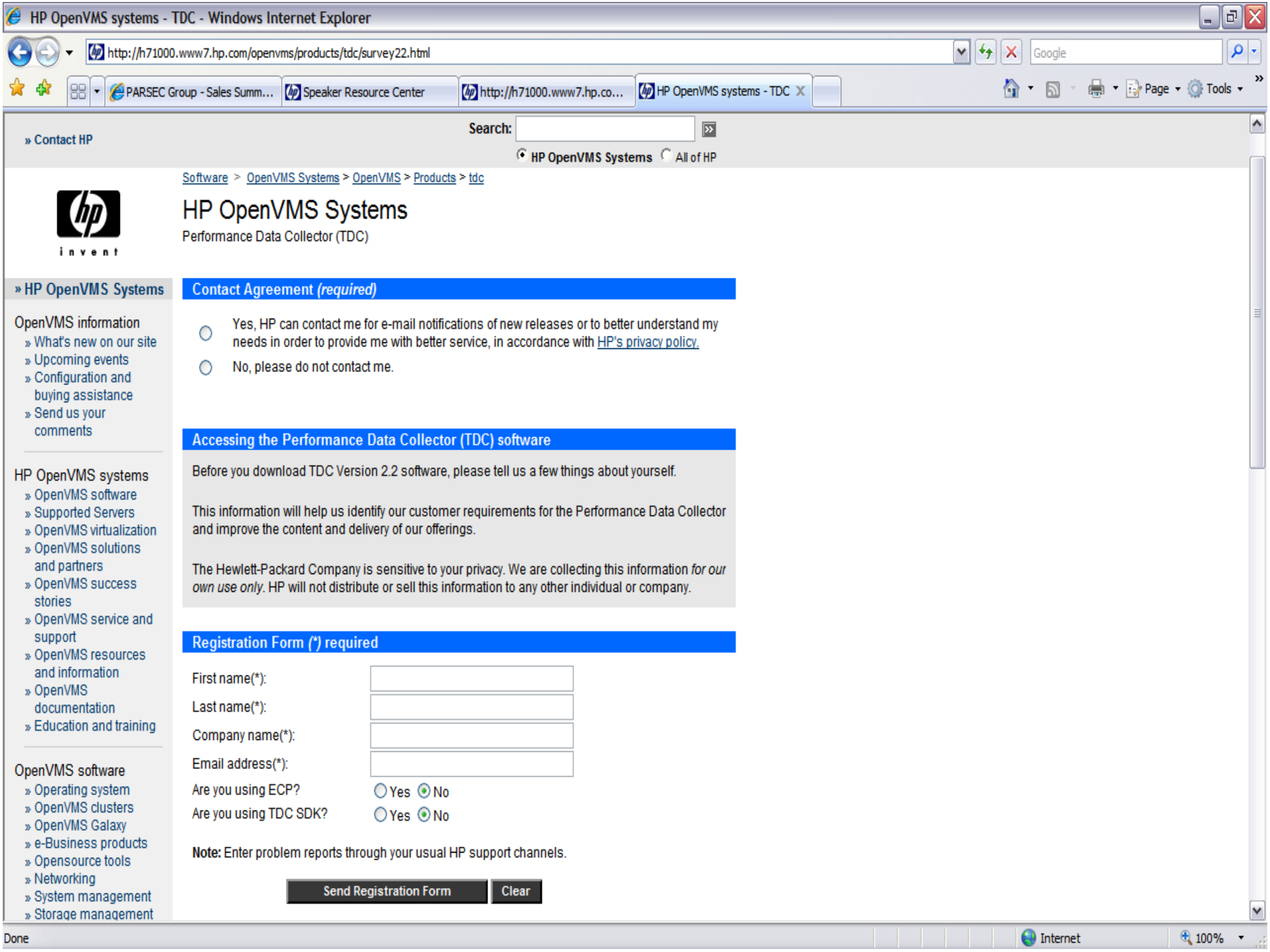
- Enable as many collectors as possible
- I typically collect data over a week period of peak performance
- Have users (or whoever will notice) document times of poor performance
- Try to break the data to be analyzed down to a short period of time
- Analyze that!

The performance Data Collector (TDC)

- The ECP data collector will not work on any version of OpenVMS above V7.3-2.
- The ECP advisor will process the performance data from TDC.
- The downloadable kit includes runtime software for Integrity server systems running OpenVMS Version 8.2, 8.2-1, or 8.3 and for Alpha systems running OpenVMS Version 7.3-2, 8.2, or 8.3.
- A Software Developers Kit is included.

TDC

- Version 2.2 is the current version of TDC.
- By default, TDC is included in the SYS$COMMON:[TDC] directory for OpenVMS Versions 8.2, 8.2-1, or 8.3.
  - TDC software should be installed only into a directory that is accessible through the SYS$SYSROOT: search list. In general, this includes SYS$SPECIFIC:[TDC] and SYS$COMMON:[TDC].
- If you do not have V2.2 you can download V2.2 using the following URL to update the Performance Data Collector software installed with OpenVMS Versions 8.2, 8.2-1, or 8.3.
  - http://h71000.www7.hp.com/openvms/products/tdc/survey22.html
  - You will have to give hp some information to get it
  - File names are:
    - HP-VMS-TDC-V0202-108-1.PCSI$COMPRESSED;1 for Itanium
    - HP-VMS-TDC-V0202-108-1.EXE;1 for Alpha
- You can also use this kit to install TDC software on OpenVMS Version 7.3-2 Alpha systems.


HP OpenVMS systems - TDC - Windows Internet Explorer
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» Opensource tools
» Networking
» System management
» Storage management
Contact Agreement (required)
Yes, HP can contact me for e-mail notifications of new releases or to better understand my needs in order to provide me with better service, in accordance with HP's privacy policy.
No, please do not contact me.
Accessing the Performance Data Collector (TDC) software
Before you download TDC Version 2.2 software, please tell us a few things about yourself.
This information will help us identify our customer requirements for the Performance Data Collector and improve the content and delivery of our offerings.
The Hewlett-Packard Company is sensitive to your privacy. We are collecting this information for our own use only. HP will not distribute or sell this information to any other individual or company.
Registration Form (*) required
First name(*):
Last name(*):
Company name(*):
Email address(*):
Are you using ECP? Yes No
Are you using TDC SDK? Yes No
Note: Enter problem reports through your usual HP support channels.
Send Registration Form
Clear
Done
Internet
100%

TDC Run Requirements

- TDC requires the following privileges to collect all data items:
  - CMKRNL LOG_IO NETMBX PHY_IO
  - SYSLCK SYSPRV WORLD
- TDC requires SYSLCK privilege to create a detached data collector process.
- Required privileges must be enabled by the user prior to using TDC.
- Any process running TDC should have a working set quota (WSQUO) greater than 7000 pagelets to run the product on Integrity server platforms, or greater than 6000 pagelets to run the product on Alpha platforms.

Initializing TDC Environment

- The following startup procedure will initialize TDC environment.

```
$ @SYS$STARTUP:TDC$STARTUP
```

- The startup procedure defines a number of system logical names required to use the product. It **does not** start TDC data collection.
- Include this in a startup command procedure.

TDC Command

- To execute TDC commands, the DCL command TDC must be defined by entering:

```
$ SET COMMAND SYS$COMMON:[TDC]TDC$DCL
```

- The TDC application can be run either with or without a TDC command included in the DCL command line.
  - If no TDC command is included in the DCL command line, the application prompts for a command. Once a command has been entered, it will be executed and the application will prompt for a new command. For example:

```
$ TDC

TDC>                    or

$ TDC  tdc-command
```

TDC Commands

- The following are the available TDC commands:
  - COLLECT to collect system performance data
  - EXTRACT to read data from a collection file
  - SHOW to display various information
  - HELP to display online help
  - STOP to stop a detached collector

Starting the TDC Collector

- TDC can be started either interactively, or in a detached process.
- To start TDC collections interactively, issue the following command:

  $ TDC COLLECT/qualifiers parameter, parameter…

- To start TDC collections in a detached process, issue the following command:

  $ TDC COLLECT/DETACHED parameter, parameter…

- The parameters in the above TDC commands are what collection record types to be collected (see the next three slides).

TDC Collection Record Types

- ADP: collects adapter configuration data
- CLU: collects cluster configuration data
- CPS: collects Cluster-Wide Process Services data
- CPU: collects CPU data
- CPUCFG: records describe CPU characteristics
- CTL: collects controller (port) configuration data
- CVC: collects cluster communication data
- DEV: collects information about storage devices
- DLM: collects Distributed Lock Manager data
- DSK: collects disk performance data
- DTM: collects Distributed Transaction Manager data

TDC Collection Record Types

- FCP: collects FCP performance data
- GLX: collects Galaxy-related data
- INET: collects internet data (DECnet and TCP/IP)
- MEM: collects memory-usage data
- NTI: collects network interface performance data
- PAR: collects all SYSGEN parameters
- PRO: collects process performance data
- SRV: collects data for the MSCP and TMSCP servers
- SYS: collects misc. system performance data
- XFC: collects XFC performance data
- XVC: collects XFC volume-cache performance data

TDC Record Groups

- You can specify the following record groups:
- **DEFAULT** - Is the default record group and specifies that the following records are gathered:
  - ADP, CPU, CPUCFG, CTL, DEV, DSK, FCP, MEM, NTI, PAR, PRO, SYS
- **CLUSTER** – Is available if the system participates in an OpenVMS Cluster, and specifies that the following records are gathered :
  - CLU, CPS, CVC, DLM, DTM, GLX, PAR, SRV
- **ALL** – This must be specifically requested for collection and specifies that the following records are gathered. **
  - DEFAULT, CLUSTER, INET, PGFL, XFC, XVC

Qualifiers Used to Start TDC

- /START_TIME: date_time - specifies a collection start time [default: now]
- /END_TIME: date_time - specifies a collection end time
- /COUNT: n - specifies a count of collection intervals
- /INTERVAL_SIZE: n - specifies the interval length, in seconds [default: 120]
- /COLLECTION_FILE: filespec - specifies the file into which to store data
- /NOCOLLECTION_FILE - specifies that the data should not be stored
- /LOG[: filespec] - enables additional status-logging messages
- /HALT_ON_ERROR - specifies that the collection should halt if an error occurs [default: the collection will continue if possible]
- /DETACHED - creates a detached collector process;

Qualifiers Used to Start TDC

- There are more qualifiers, but they are usually not used
- There are three special symbols that are available for use in file names:
  - %N: will be replaced by the name of the node on which the collection is run
  - %D: will be replaced by the date, as in "YYMMDD"
  - %T: will be replaced by the time, as in "HHMMSS“
  - For example the following will create a file name of DAILY07070212022 2 - TDC$DAT for July 2, 2007 at 12:02:22

```
TDC> COLLECT/COLLECTION_FILE=DAILY$%D%T ALL
```

Starting TDC Example

```
TDC> collect/detach all

%TDC-I-PREPDET, Preparing detached process PARSEC::TDC$SAUERCF7E ...
    Command file: $22$DKA300:[SAUER]TDC$PARSEC$070523173423.COM;1
        Log file: $22$DKA300:[SAUER]TDC$PARSEC$070523173423.LOG
    Detached collector started, ID: 35800467
TDC> show collect
%TDC-I-PRVENBLSYSL, SYSLCK privilege enabled
%TDC-I-COLACTCLU, 1 TDC data collector(s) currently active in the cluster

Active data collectors:

PARSEC::SAUER, Process: TDC$SAUERCF7E [ID: 35800467] (Det)

TDC>exit
%TDC-I-PRVRSTDEF, Startup privileges restored
$
$ show sys/proc=tdc*
OpenVMS V8.3  on node PARSEC  23-MAY-2007 17:36:52.29  Uptime  2 19:19:24
  Pid    Process Name    State  Pri      I/O       CPU       Page flts  Pages
35800467 TDC$SAUERCF7E   HIB      6      394   0 00:00:02.18      1606    956
$
```

Showing TDC Collector(s)

- TDC collector(s) can be shown with the following command:

  TDC> SHOW [/qualifiers] COLLECTOR

- Multiple qualifiers can be used on the same command line. The following Qualifiers can be specified:

  /node= /username= /process_name=
  /all /identification= /cluster
  /full /output=

```
TDC> show collector
%TDC-I-PRVENBLSYSL, SYSLCK privilege enabled
%TDC-I-COLACTCLU, 1 TDC data collector(s) currently active in the cluster
Active data collectors:
PARSEC::SAUER, Process: TDC$SAUER305D [ID: 35800452] (Det)
```

Stopping TDC Collector(s)

- A TDC collector can be stopped with the following command:

  TDC> STOP [/qualifiers]

- Multiple qualifiers can be used on the same command line. The following Qualifiers can be specified:

  /node= /username= /process_name=

  /all /identification= /cluster

```
TDC> stop/node=parsec
%TDC-I-NTFYACTCOLLS, Sending notification to active TDC data collectors
Active collectors...
PARSEC::SAUER, Process: TDC$SAUER305D [ID: 35800452]
TDC>
```

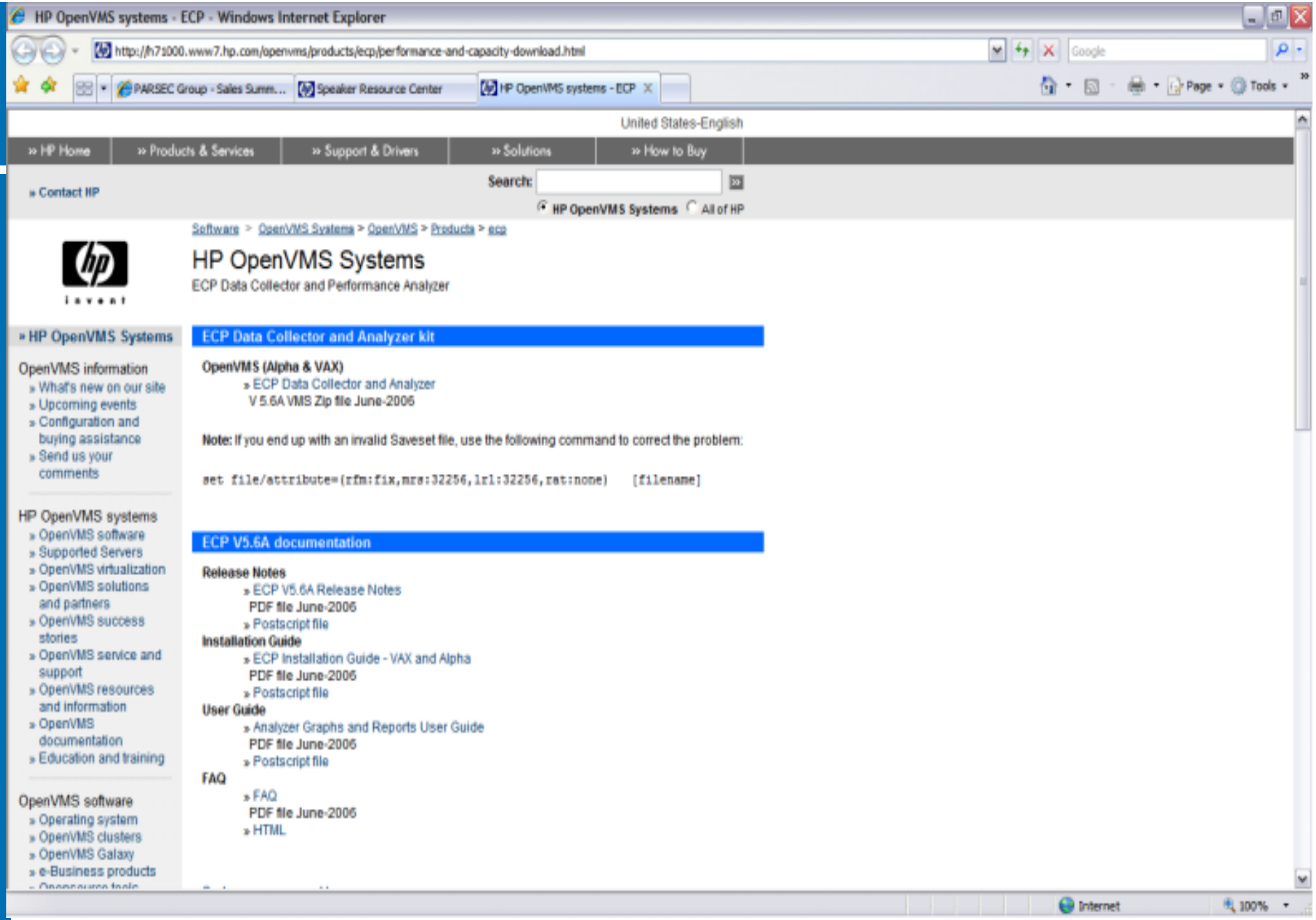
Enterprise Capacity Planner (ECP)

- Has three components
  - Data collector (for up to OpenVMS V7.3-2)
  - Graphical analyzer
  - Capacity planner
- Data collector and analyzer are free
- Uses DECwindows graphical interface
- Runs on Alphas and VAXen V6.2 and higher
- For data collection for any version of OpenVMS above V7.3-2, you need The performance Data Collector (TDC)

ECP URLs

- Download ECP From:

  http://h71000.www7.hp.com/openvms/products/ecp/performance-and-capacity-download.html
- This page contains the ability to download
  - ECP
  - The Release Notes
  - The Installation Guide
  - The User's Guide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http://h71000.www7.hp.com/openvms/products/ecp/performance-and-capacity-download.html
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» HP Home
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» Education and training
OpenVMS software
» Operating system
» OpenVMS clusters
» OpenVMS Galaxy
» e-Business products
ECP Data Collector and Analyzer kit
OpenVMS (Alpha & VAX)
» ECP Data Collector and Analyzer
V 5.6A VMS Zip file June-2006
Note: If you end up with an invalid Saveset file, use the following command to correct the problem:
set file/attribute=(rfm:fix,mrs:32256,lrl:32256,rat:none) [filename]
ECP V5.6A documentation
Release Notes
» ECP V5.6A Release Notes
PDF file June-2006
» Postscript file
Installation Guide
» ECP Installation Guide - VAX and Alpha
PDF file June-2006
» Postscript file
User Guide
» Analyzer Graphs and Reports User Guide
PDF file June-2006
» Postscript file
FAQ
» FAQ
PDF file June-2006
» HTML
Internet
100%

ECP Installation Steps

- Download ECP Zip file vecp056a_vms.zip (about 10.4mb)
- Download release notes and ECP manuals
- Read the release notes and manuals (yeah right!)
- ftp the zip file to the OpenVMS system
- Unzip the file
- Use VMSINSTAL to install ECP

Unzip for OpenVMS

- You can either unzip the file on the PC and ftp the savesets, or you can unzip the files on the OpenVMS system.
- unzip can be found on the freeware cd #1 in the following directories:
  - Itanium - [000TOOLS.IA-64_IMAGES]
  - Alpha - [000TOOLS.ALPHA_IMAGES]
  - VAX - [000TOOLS.VAX_IMAGES]
- Or it can be found in the T4 backup save set in the SYS$ETC directory named T4_V33_KIT.BCK in version 7.3-2 or later or T4_V34_KIT.EXE in the current version of OpenVMS.
- The following is an ECP installation example:

```
$ unzip vecp056A_vms.zip
Archive:  $22$DKA300:[SAUER.ECP]vecp056A_vms.zip;1
  inflating: vecp056A.a
  inflating: vecp056A.b
  inflating: vecp056A.c
  inflating: vecp056A.d
$ dir

Directory $22$DKA300:[SAUER.ECP]

VECP056A.A;1        VECP056A.B;1        VECP056A.C;1
VECP056A.D;1        VECP056A_VMS.ZIP;1

Total of 5 files.
$ @sys$update:vmsinstal

        OpenVMS  Software Product Installation Procedure V8.3


It is 17-MAY-2007 at 11:30.

Enter a question mark (?) at any time for help.

%VMSINSTAL-W-NOTSYSTEM, You are not logged in to the SYSTEM account.
```

```
* Are you satisfied with the backup of your system disk [YES]?
* Where will the distribution volumes be mounted: $22$DKA300:[SAUER.ECP]

Enter the products to be processed from the first distribution volume set.
* Products: vecp056a
* Enter installation options you wish to use (none):

The following products will be processed:

  VECP0 V56.A

        Beginning installation of VECP0 V56.A at 11:31

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
%VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.

Enterprise Capacity Performance Analyzer (Alpha) Installation
------------------------------------------------------------------------

Copyright (c) 1997, 2006 Hewlett-Packard Development Company, L.P.
All rights reserved.

* Do you want to purge files replaced by this installation [YES]?
```

```
%VECP0-I-LIBRARY, ECP$PERF_DATA is currently defined to be
USER$DISK:[SAUER.PERFMON]
* Is this the correct directory for ECP/Collect Data [Y]:
%VECP0-W-BADLIBRARY, Invalid directory specification
* Enter ECP/Collect Data Directory [SYS$SYSDEVICE:[ECP$PERF_DATA]]:
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
SYS$SYSDEVICE:[ECP$PERF_DATA].
%CREATE-I-EXISTS, SYS$SYSDEVICE:[ECP$PERF_DATA] already exists

    No more input is required to complete this installation.  From
    this point the installation will proceed automatically.

    The installation should complete in approximately 5 to 15 minutes.

%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-RESTORE, Restoring product save set C ...

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
directories...
```

Installation Verification Procedure for Enterprise Capacity Performance Analyzer

```
PLAN ANALYZE/CPC_VMS_FILE=DISCOS_1998MAR03_2117.CPC
   /analyze_report=sys$scratch:xxx.rpt/BEGIN=03-mar-1998:21:17
   /end=03-mar-1998:21:27
 Enterprise Capacity Performance Analyzer V5.6A-30 (c) 1997, 2006
Hewlett-Packard Development Company, L.P., All Rights Reserved.
ECP-INFO  ECP/Analyze processing...
ECP-INFO  Writing ECP/Analyze report to SYS$SCRATCH:XXX.RPT ...
       *-------------------------------------------------------*
       *            Installation Verification Procedure        *
       *                          for                          *
       *         Enterprise Capacity Performance Analyzer      *
       *                                                       *
       *                  IVP COMPLETED SUCCESSFULLY           *
       *-------------------------------------------------------*


+-------------------------------------------------------------------+
*                                                                   *
* After the installation is finished, you should add the following  *
* line to the end of SYS$MANAGER:SYSTARTUP_VMS.COM                  *
*                                                                   *
*       $ @SYS$STARTUP:ECP$STARTUP.COM                              *
*                                                                   *
* If you intend to collect data on a daily basis into individual files,*
* add the following line to the end of SYS$MANAGER:SYSTARTUP_VMS.COM *
*                                                                   *
*       $ @ECP$LIBRARY:ECP$MANAGER.COM                              *
*                                                                   *
+-------------------------------------------------------------------+
```

```
        Installation of VECP0 V56.A completed at 11:37

    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY

    Creating installation data file:
VMI$ROOT:[SYSUPD]VECP056A.VMI_DATA
New mail on node CLASS2 from CLASS::SAUER        (11:37:49)

Enter the products to be processed from the next distribution volume
set.
* Products: exit

        VMSINSTAL procedure done at 11:42


CLASS2>
```

ECP$MANAGER

- Only applies to the ECP collector, which only runs on OpenVMS V7.3-2 or earlier systems.
- Is the command procedure that initiates data collection.
- The following command should be in SYS$MANAGER:SYSTARTUP_VMS.COM after the queue manager has been started.

  Or can be manually executed if the ECP$MANAGER fails to start.

  - $ @ECP$LIBRARY:ECP$MANAGER
- By default it resubmits itself every 24 hours to the queue defined by the ECP$DC_QUEUE logical name.

ECP Logical Names

- ECP$LIBRARY – is where the ECP startup command file ECP$MANAGER.COM resides
- ECP$DC_INTERVAL – Determines the data collection interval
- ECP$DC_QUEUE – Determines where ECP$MANAGER resubmits itself
- ECP$PERF_DATA- Determines where ECP$MANAGER places the .CPC files that contain the binary performance data. And where the graphical analyzer looks for performance files. Keep in mind that the graphical analyzer only sees the latest version of TDC files.
  - The .CPC files have the following format:
    - ECP_node_yyyymmmdd_version.cpc
    - For example: PARSEC_2004MAR29_1.CPC;1
  - By default all of the TDC collector files are al named TDC$COLLECTION.TDC$DAT

```
$ SHOW LOG ECP*

(LNM$PROCESS_TABLE)

 "ECP$$KI" =
"PARSEC$DRA0:[SYS0.SYSCOMMON.][DECW$DEFAULTS.USER]ECP.DAT;"
 "ECP$$TEST" = "VMI$ROOT:[SYSTEST]ECP.DIR;"
 "ECP$EXE" = "VMI$ROOT:[SYSEXE]ECP$PLAN.EXE;"
 "ECP$FILE" = "SYS$SYSDEVICE:[ECP]ECP_HOTSPOT.MSG;"
 "ECP$LIC" = "SYS$SYSDEVICE:[ECP]ECP.LICENSE;"

(LNM$JOB_815A9F00)

(LNM$GROUP_000007)

(LNM$SYSTEM_TABLE)

 "ECP$CPDRIVER" = "CPA0:"
 "ECP$DC_INTERVAL" = "300"
 "ECP$DC_QUEUE" = "SYS$BATCH"
 "ECP$LIBRARY" = "SYS$SYSDEVICE:[ECP]"
 "ECP$PERF_DATA" = "SYS$SYSDEVICE:[ECP$PERF_DATA]"
 "ECP_LIBRARY" = "SYS$SYSDEVICE:[ECP]"

(LNM$SYSCLUSTER_TABLE)
$
```

ECP Data Collection Commands

- You can manually start the ECP Data Collector (DC).
- The ECP DC allows for 2 data collections at any given time. These collectors are accessed through the following DCL command:
  - $ PLAN COLLECT=[POLL, SAMPLE]/Qualifiers
- The PLAN Command has the following qualifiers:

Qualifier	Default	Available for
/BEGIN=time	Current.	POLL, SAMPLE
/END=time	None.	POLL, SAMPLE
/STOP	None.	POLL, SAMPLE
/INTERVAL=rate	300 (seconds)	POLL, SAMPLE
/STATUS	None.	POLL, SAMPLE
/OUTPUT	ECP$xxx.CPC	POLL, SAMPLE

  - xxx – sample or poll depending on which collection

ECP Analyzer Command

- The following DCL command analyzes performance data and provides graphs and reports. These functions are only available through a MOTIF user interface.
  - $ PLAN ANALYZE /qualifiers
  - The PLAN DCL command has the following qualifiers:
    - /CPC_VMS_FILE=file_spec
    - /BEGIN=time /END=time
    - /ANALYZE_REPORT_FILE=file_spec.
    - /DUMP=file_spec.csv /MOTIF
    - /INTERFACE=([MOTIF], CHARACTER_CELL).
    - /CSV_UTIL_MODE=file_spec /CSV_IO_RATE=file_spec
    - /CSV_PAGE_FAULT=file_spec
    - /CSV_PROCESSOR_UTIL=file_spec
    - /CSV_MEMORY_MODE=file_spec

Starting ECP collections

```
$ show log ecp$dc_queue
   "ECP$DC_QUEUE" = "SYS$BATCH" (LNM$SYSTEM_TABLE)
$ show queue ecp$dc_queue
Batch queue SYS$BATCH, idle, on PARSEC::
$ @ecp$library:ecp$manager
 PLAN
COLL=POLL/INTERVAL=300/OUTPUT=ECP$PERF_DATA:PARSEC_2004JUL22_
1.cpc
    Status of ECP_POLL
    File       :
PARSEC$DRA0:[ECP$PERF_DATA]PARSEC_2004JUL22_1.CPC;1
    Interval   : 300 seconds
    Sample     : 0
    Start Time : 22-JUL-2004 11:43:50.72
    End Time   : not specified
Submitting ECP$MANAGER.COM
Job ECP$MANAGER (queue SYS$BATCH, entry 192)holding until 23-
JUL-2004 00:01
$ show queue ecp$dc_queue
```

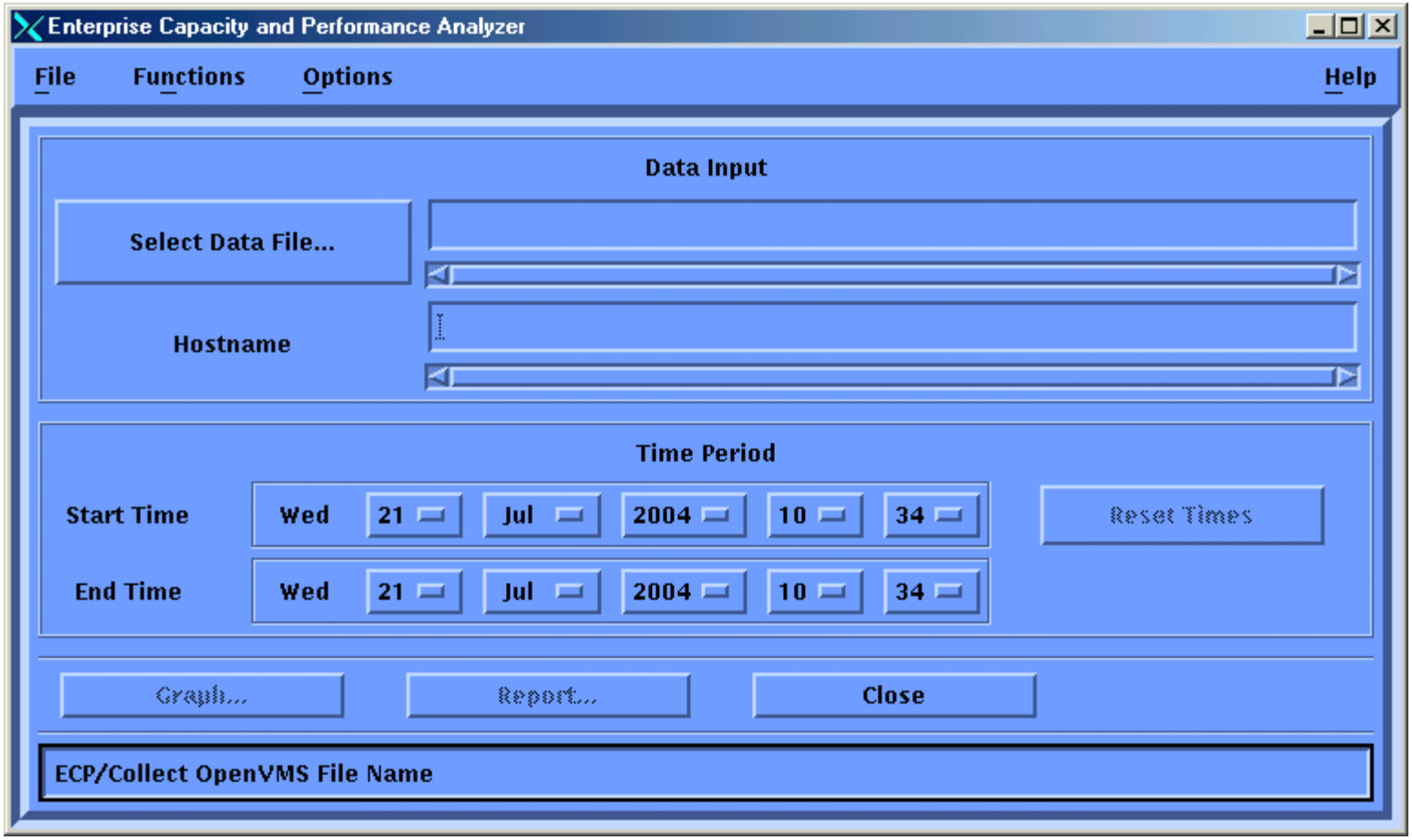
Starting ECP collections (Continued)

```
Batch queue SYS$BATCH, idle, on PARSEC::

  Entry  Jobname         Username      Status
  -----  -------         --------      ------
    192  ECP$MANAGER     SAUER         Holding until 23-JUL-
2004 00:01:00
$

$ dir ecp$perf_data

Directory SYS$SYSDEVICE:[ECP$PERF_DATA]

PARSEC_2004JUL22_1.CPC;1

Total of 1 file.
$
```

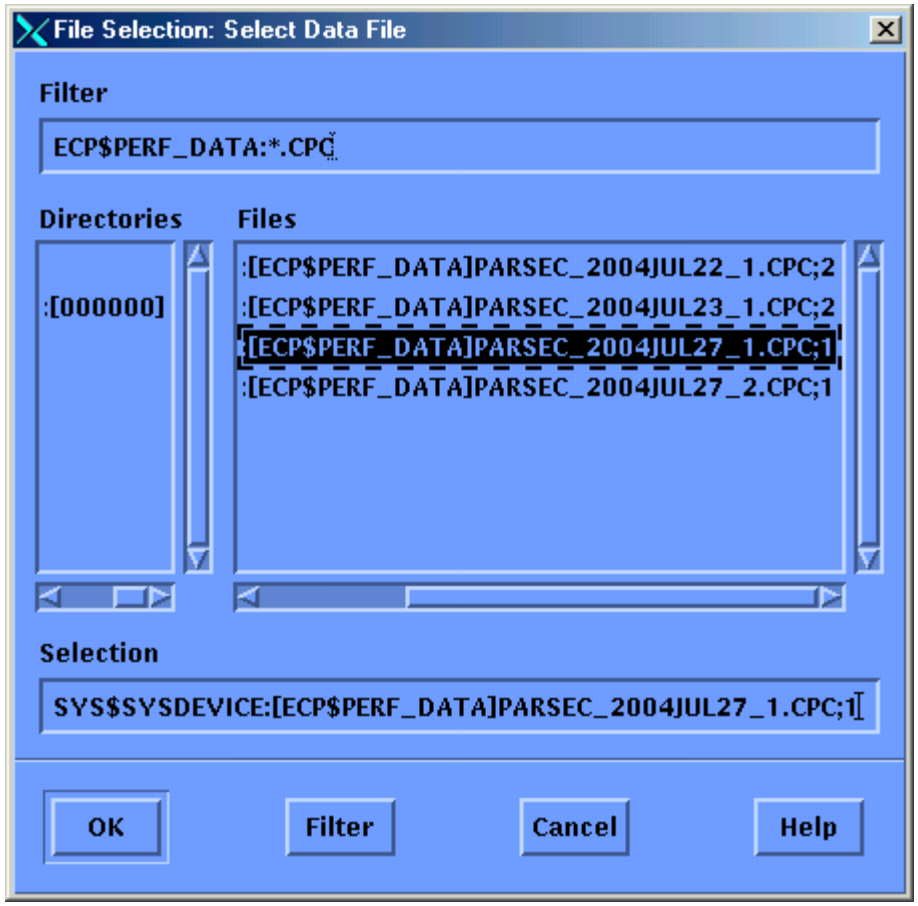
Viewing ECP data

- Viewing graphical data requires X windows capabilities.
- The following example illustrates how to view ECP data.
- At the DCL prompt type:

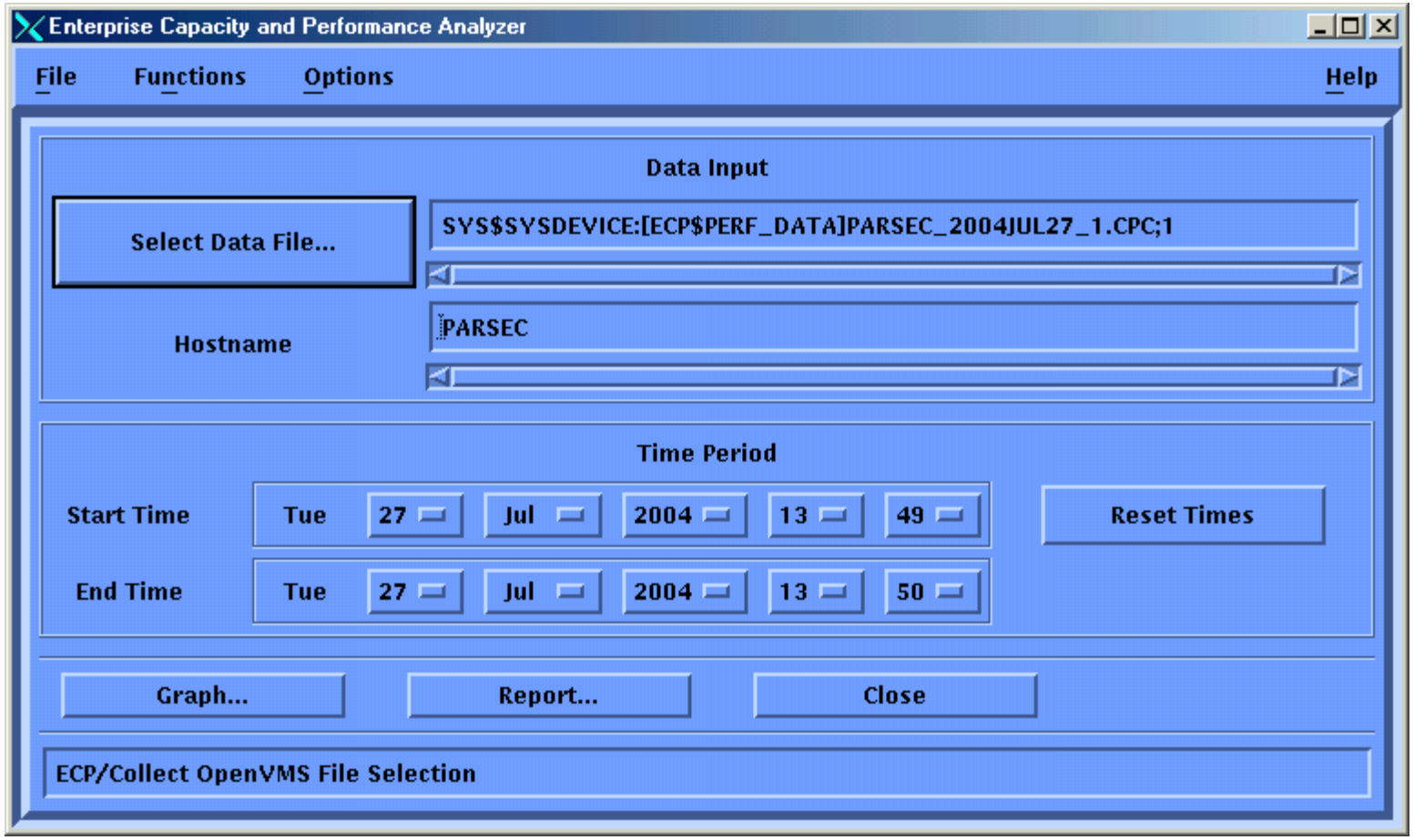
```
$ PLAN ANALYZE/MOTIF
```



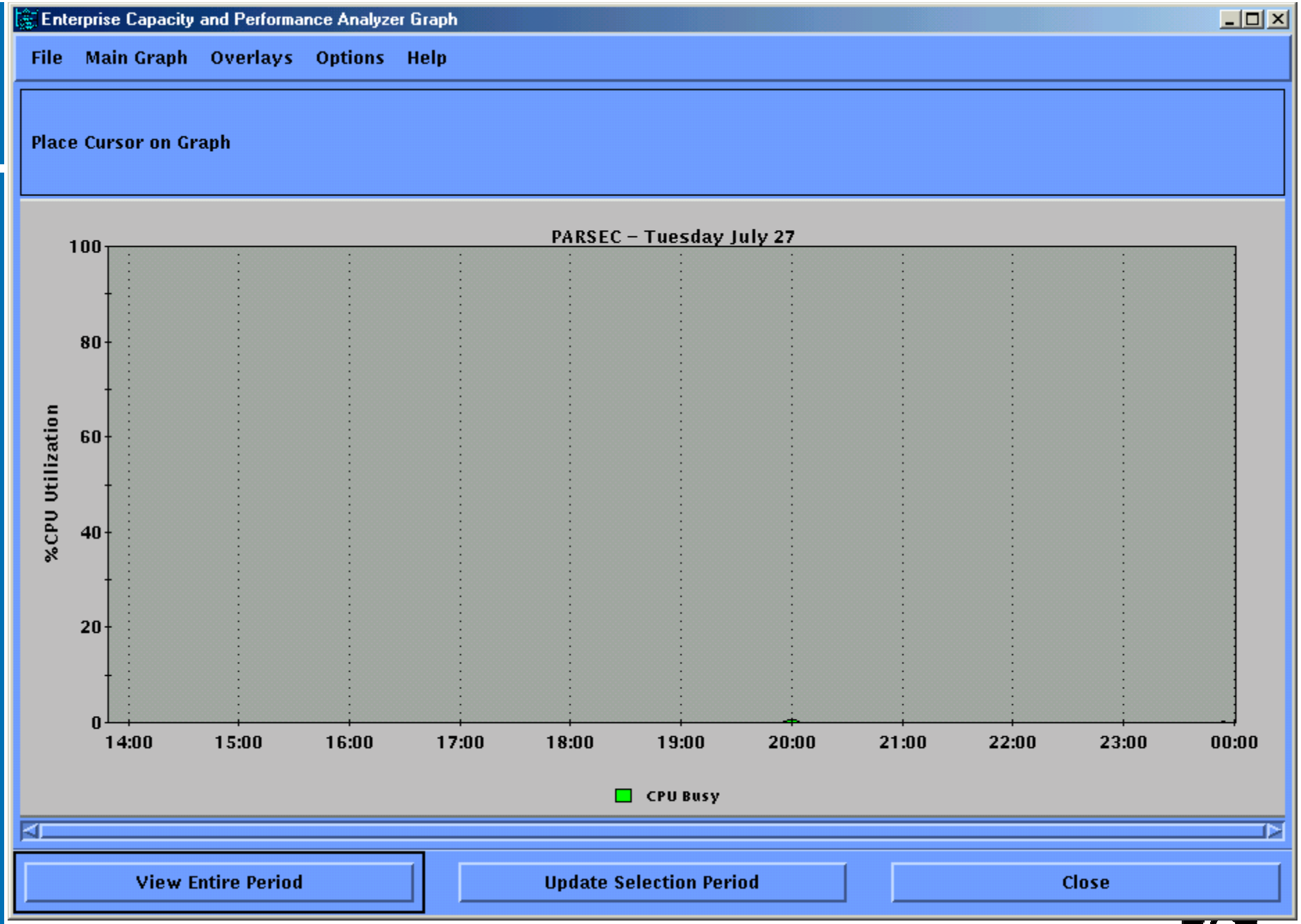
- This is the first dialog box.
- First click on the Select Data Files box to select a data file



Select a file and click on the OK button. If you are reading TDC data, you have to point the logical name ECP$PERF_DATA to the directory that has the TDC files. Remember, only the latest version of the TDC file will be displayed by default.

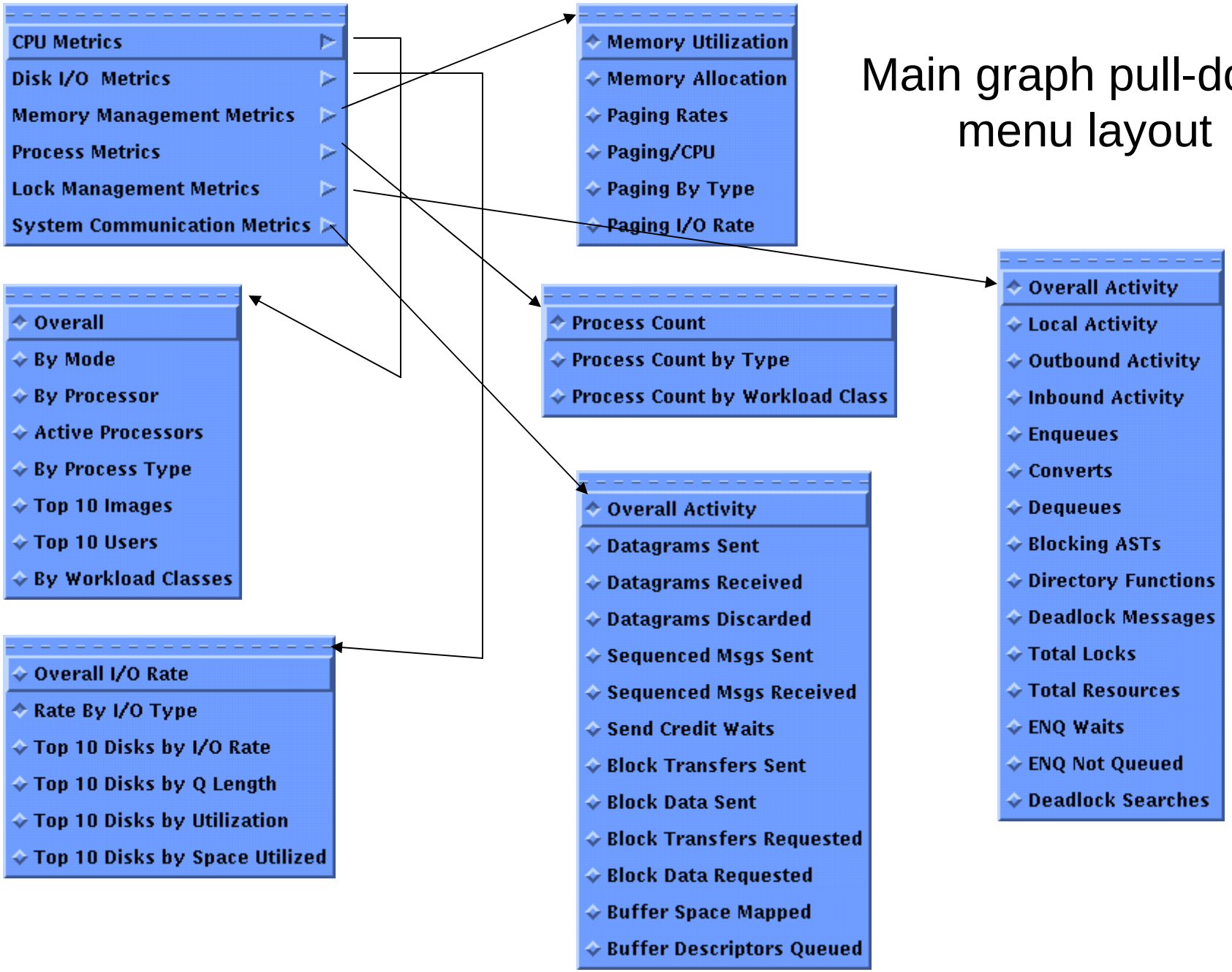


- Now we can either generate graphs or reports
- In the first example, we will generate a graph
- Click the Graph button
- Notice that the start and end times are filled in based on the collection times in the .CPC file. If you want different start and end times, select them

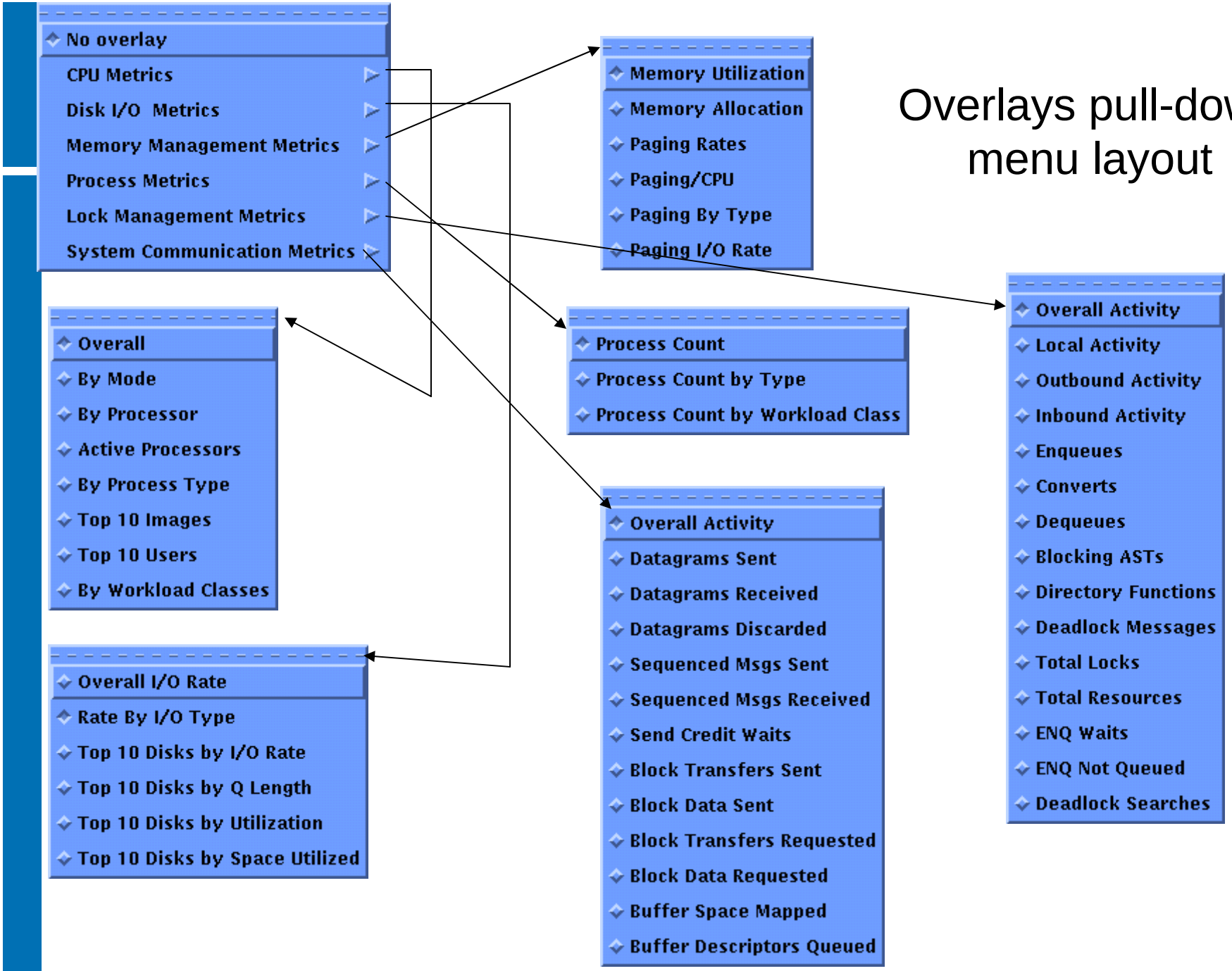


This screen will be the first to come up. In this case, there was no CPU activity

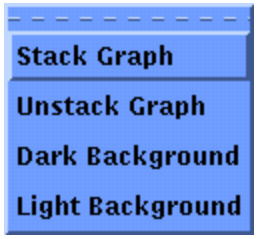
Main graph pull-down menu layout



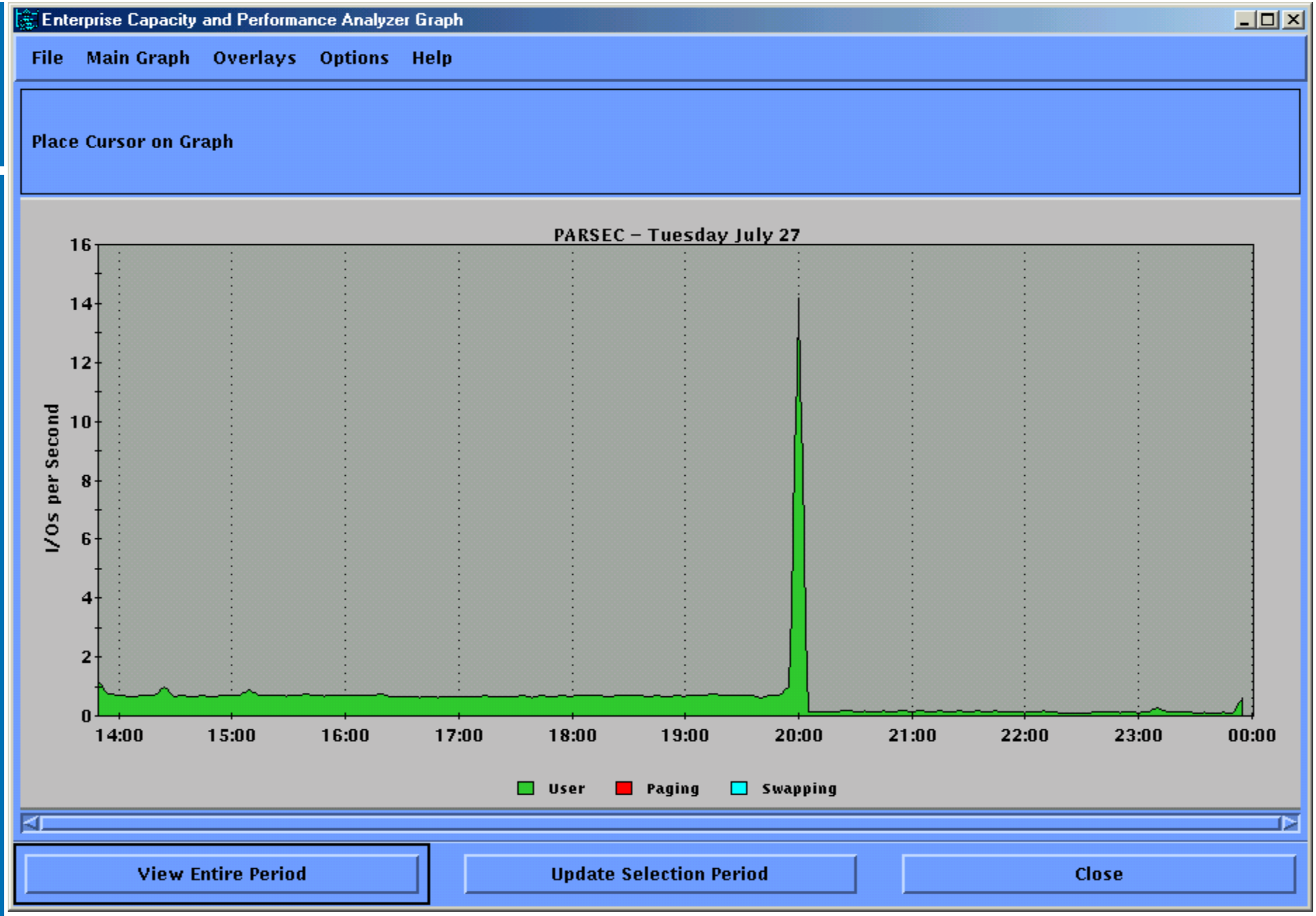
Overlays pull-down menu layout



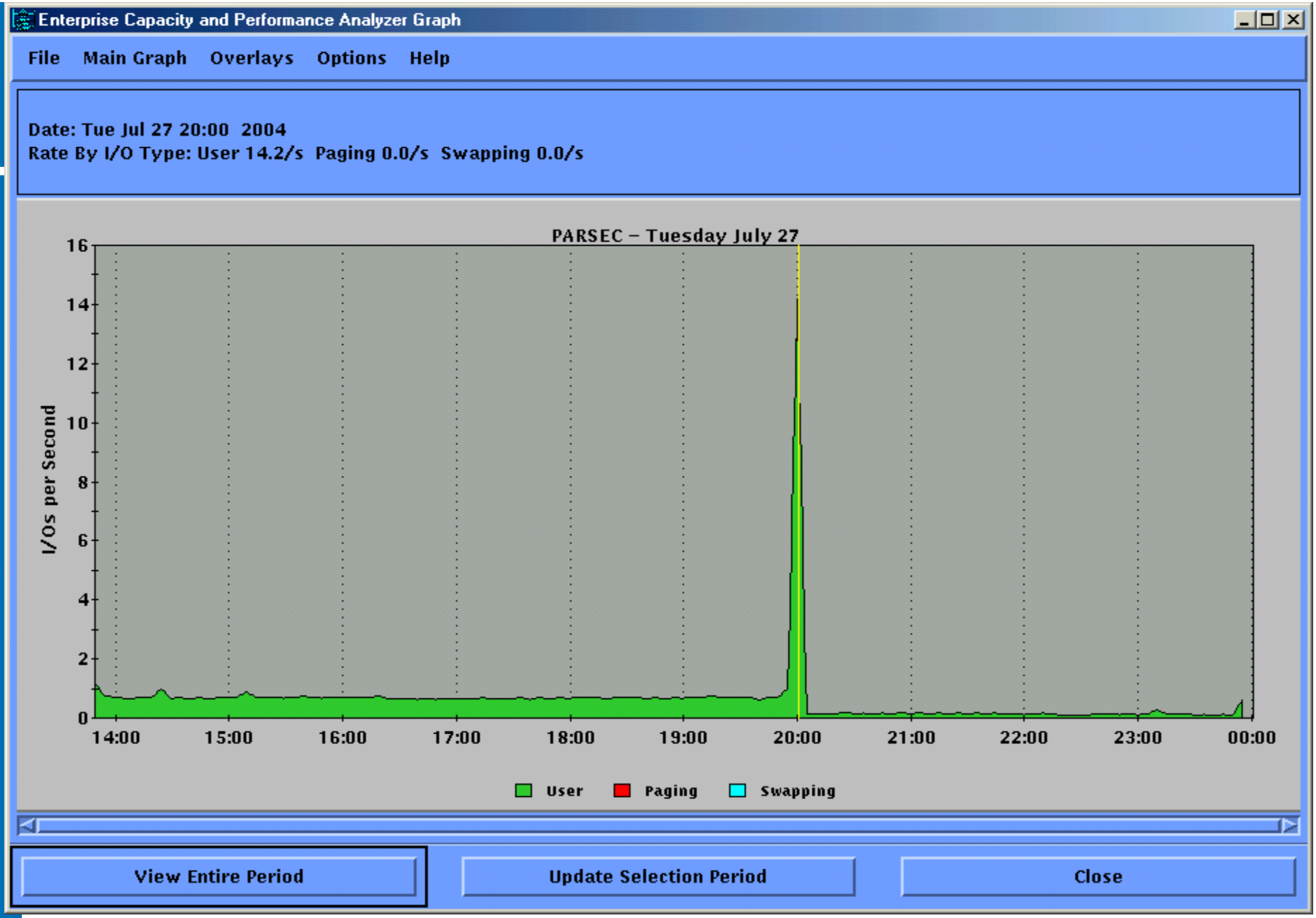
Options pull-down menu layout



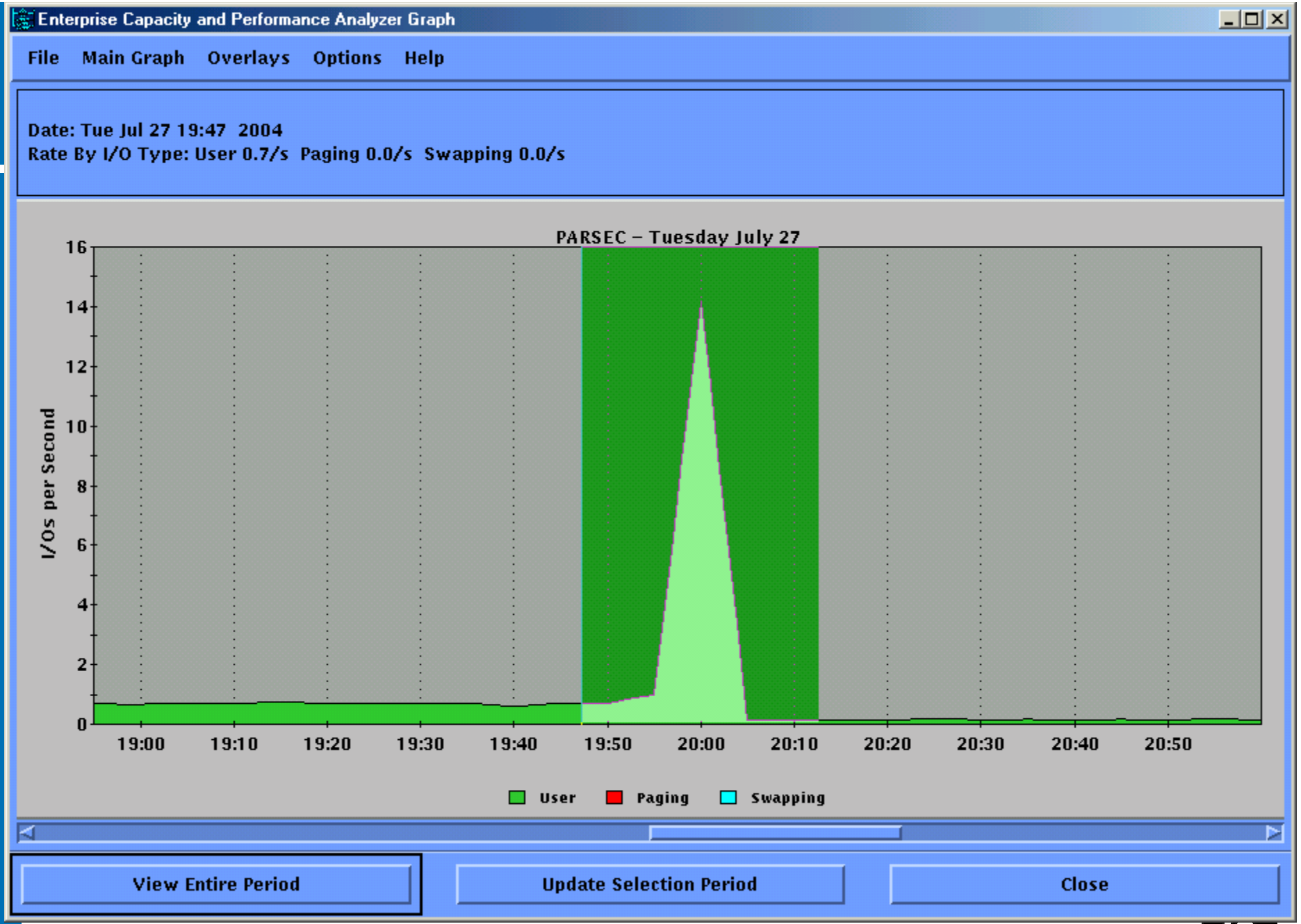
- The Stack and Unstack Graph are very useful options
- The Dark and Light background is just a matter of preference



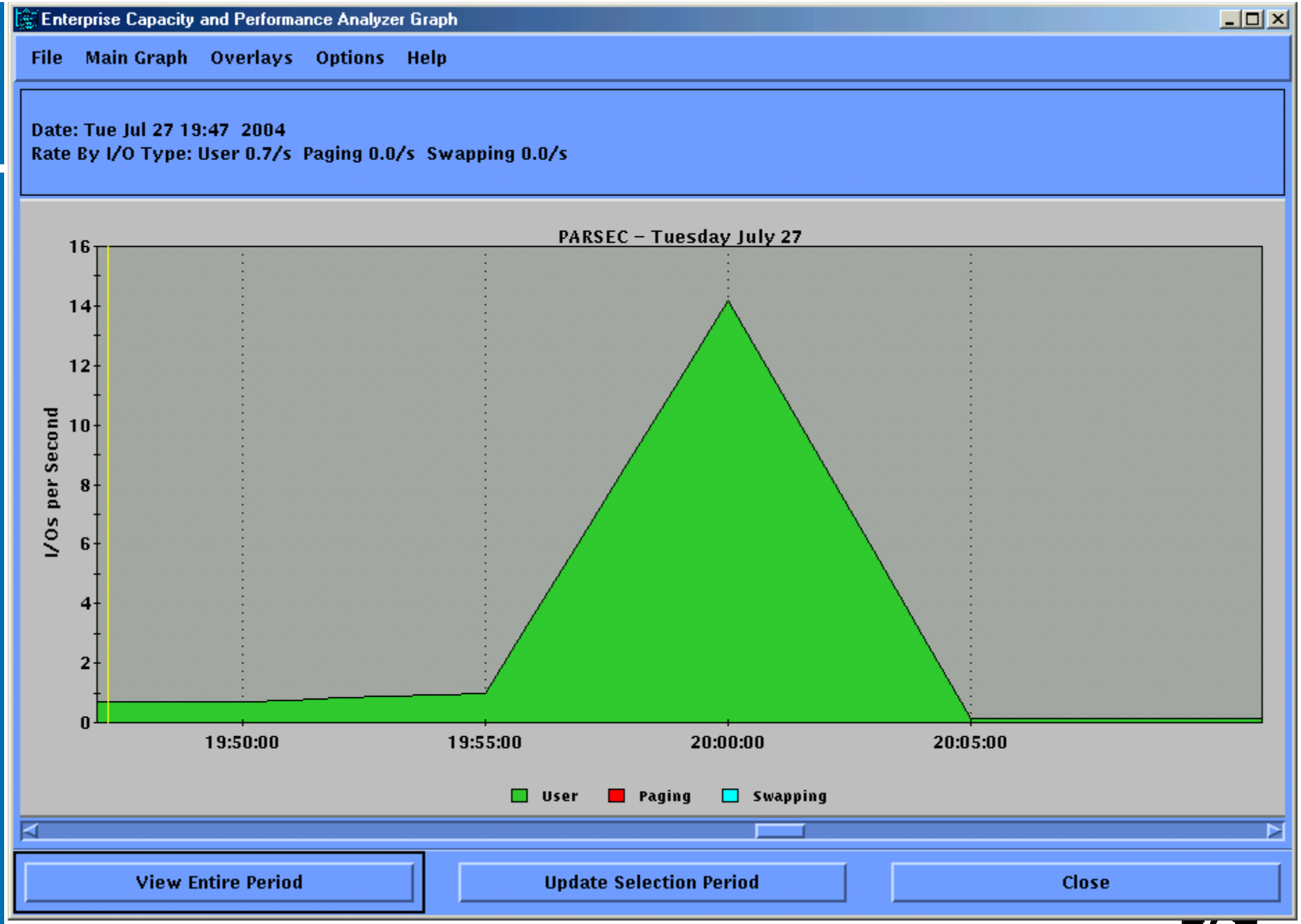
This is an example of an I/Os per second graph



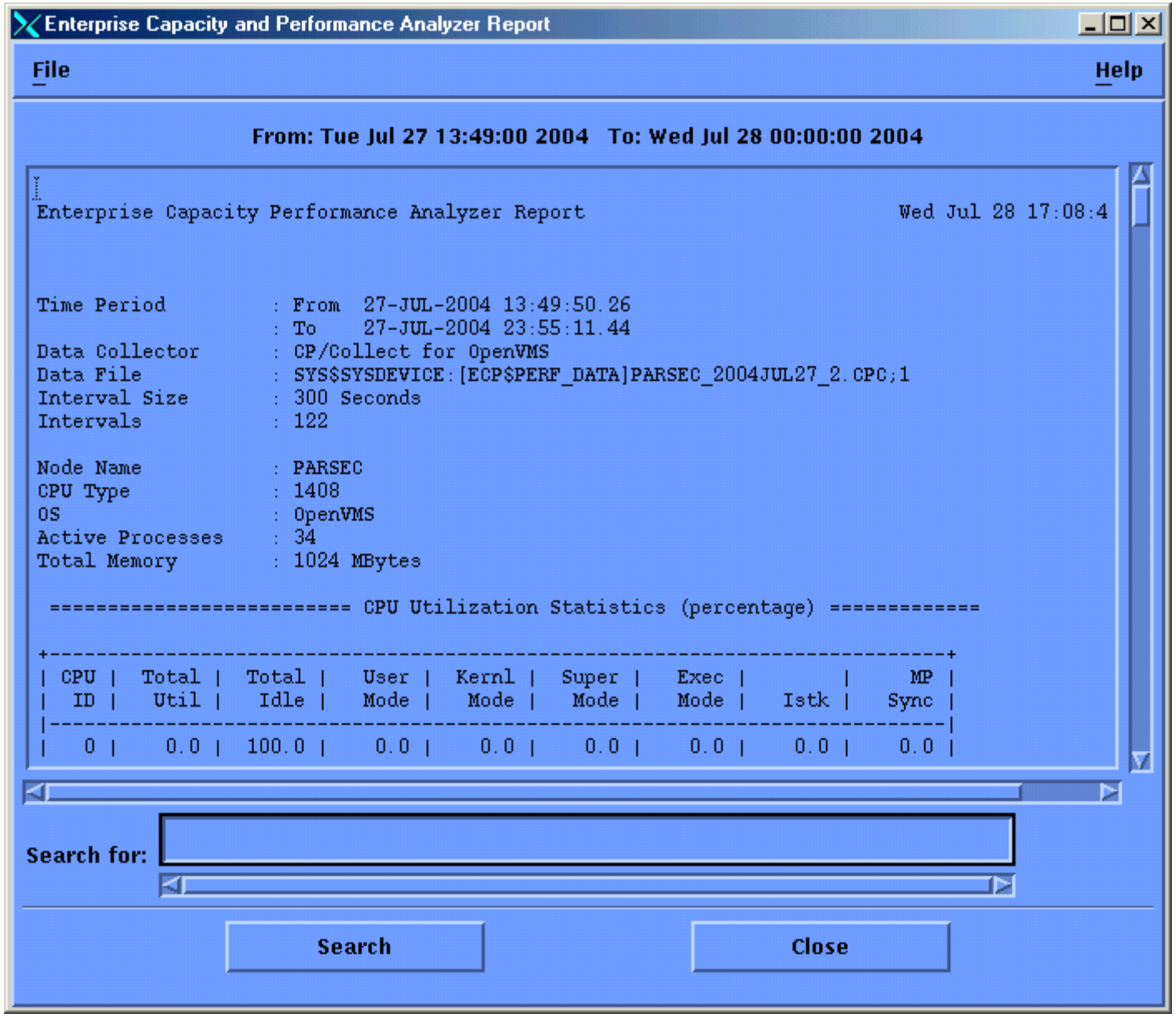
Placing the cursor on the graph will produce the yellow line and will report the value of the item you are looking at for that period of time.



Highlighting an area of the graph by clicking and dragging will expand the selected area



Clicking on the View Entire Period will get you back to the previous view



This is an example of an ECP report

T4

- T4 – Tabular Timeline Tracking Tool
- Runs on OpenVMS
- Automatically creates historical archive
- Draws from multiple data sources
- Multiple performance metrics per source
- Merges to a **synchronized timeline** view
- Creates two-dimensional table (CSV)
  - CSV files can be imported to excel and other programs to create performance graphs

Acquiring the T4 Tool Kit

- You can download the T4V4 tool kit from **http://h71000.www7.hp.com/OpenVMS/products/t4/index.html**
- At this site, you can find the T4 kit, as well as the readme file, which is VERY beneficial
- T4V33 tool kit ships with the release of OpenVMS V7.3-2 in SYS$ETC:
- T4V34 tool kit ships with the release of OpenVMS V8.2 in SYS$ETC:
- T4 collection can be a useful **adjunct** to your existing performance management program.

Installing T4

- Create either one directory to hold all T4 program and collection files or create one directory to hold the program files and one to hold the collection files
- There are two logical names to point to these directories:
  - T4$DATA – points to the directory for the collection files
  - T4$SYS – points to the directory for the program files
  - Define these logical names in SYS$MANAGER:SYLOGICALS.COM
- Use the backup utility to install the T4V33 and T4V34 program files
- Use the PCSI utility to install the T4V4 program files

Installing T4V33 or T4V34

- First create the directory, inflate the compressed saveset, and then restore it as follows:

```
$ define/sys/exec t4$sys
  sys$sysdevice:[vms$common.t4$sys]
$ create/dir t4$sys
$ set def t4$sys
$ copy sys$etc:t4_v34_kit.exe *
$ run t4_v34_kit.exe
UnZipSFX 5.40 of 28 November 1998, by Info-ZIP (Zip-
  Bugs@lists.wku.edu).
   inflating: t4_v34_kit.bck
   inflating: t4_v34_kit.txt
   inflating: reset_backup_saveset_file_attributes.com
$ backup t4_v34_kit.bck/sav []
```

Installing T4V4

- To install T4V4 you must deassign any current T4$SYS logical names and then use the PCSI utility
- If you have to FTP the file to your system, you may need to repair it with the following command:

```
$ set file/att=(rfm:fix,lrl:512) -
  HP-VMS-T4-V0400--1.pcsi$compressed
$ dir
Directory SYS$SYSDEVICE:[VMS$COMMON.T4$SYS]
HP-VMS-T4-V0400--1.pcsi$compressed;2
Total of 1 file.
$ show log t4$sys
  "T4$SYS" = "SYS$SYSDEVICE:[VMS$COMMON.T4$SYS]
   (LNM$SYSTEM_TABLE)
$ deass/sys/exec t4$sys
```

Installing T4V4

```
$ product install t4

The following product has been selected:
    HP VMS T4 V4.0                Layered Product

Do you want to continue? [YES]

Configuration phase starting ...

You will be asked to choose options, if any, for each selected
  product and for
any products that may be installed to satisfy software
  dependency requirements.

HP VMS T4 V4.0: HP T4 for VMS

    © Copyright 1976, 2004 Hewlett-Packard Development Company,
  L.P.

    Hewlett-Packard Development Company, L.P.

    T4 Version 3.4
```

Installing T4V4

```
* This product does not have any configuration options.

Execution phase starting ...

The following product will be installed to destination:
    HP VMS T4 V4.0                          DISK$I64SYS:[VMS$COMMON.]
Portion done: 0%...30%...40%...50%...70%...80%...90%

 T4 uses the system logical T4$SYS
 You should add the following line to SYS$MANAGER:SYLOGICALS.COM
    "$ define/system/exec T4$SYS DISK$I64SYS:[SYS0.SYSCOMMON.T4$SYS]"

 You may wish to create a default directory for T4's data files
 This directory SHOULD NOT be on the system disk
 and can be pointed to with the logical T4$DATA

...100%

The following product has been installed:
    HP VMS T4 V4.0                          Layered Product
$
```

Currently SIX T4 Collectors

- MONITOR /ALL /INTERVAL= 60
- XFC (SHOW MEM / CACHE)
- Dedicated lock manager (Busy %, Request)
- TCPIP traffic system wide (pkts, mbs)
- Network adapter (0,1, or more)
- Login/Logout extraction from accounting log file

Viewing Collector Processes

```
$ show sys
OpenVMS V8.2  on node PARSEC  11-OCT-2005 11:20:29.95  Uptime  52 19:11:00
  Pid    Process Name    State  Pri      I/O       CPU        Page flts  Pages
20800401 SWAPPER         HIB     16        0   0 00:00:00.70          0      0
20800404 LANACP          HIB     13       67   0 00:00:00.02        103    127
20800406 FASTPATH_SERVER HIB     10        9   0 00:00:00.01         75     90
2080040F ACME_SERVER     HIB      9      103   0 00:00:00.14        385    511 M
20800410 TP_SERVER       HIB     10     4980   0 00:00:07.68         72     94
                          o
                          o
                          o
20800559 T4$V34_111122   HIB      6     1065   0 00:00:00.20       2097    319  B
20800561 T420800559_MON  LEF     15       35   0 00:00:00.02        340    404  S
20800562 T420800559_XFC  HIB     15       57   0 00:00:00.04        657    309  S
20800563 T420800559_Lck7 HIB     15       60   0 00:00:00.07        655    300  S
20800564 T420800559_TCP  HIB     15       94   0 00:00:00.05        754    426  S
20800565 T420800559_FCM  HIB     15       60   0 00:00:00.04        738    413  S
20800566 T420800559_EIA0 HIB     15       86   0 00:00:00.05        917    419  S
2080045F SAUER           CUR  3   4     2408   0 00:00:04.02       2235    126
```

T4 Utilities

- T4$CONFIG.COM – Launches the T4 collection session and re-submits itself
- T4$COLLECT.COM – Collection procedure
- T4EXTR – Can be used to create .CSV files from Monitor binary files
- ARPC – Can be used to append multiple .CSV files
- T4$Now – Used to produce a snapshot .CSV file without stopping the collectors
- T4$ABORT – Will stop a T4 measurement session on demand

T4 DCL Command Verbs

- There are .CLD files for T4ABORT and T4EXTR
- To use them, issue the following command

```
$ set default t4$sys
$ set command t4$mon_extract
$ set command t4$abort
```

- The command syntax for T4ABORT is:

```
$ T4ABORT /IDE=pid-of-collect-batch-job
```

- The command syntax for T4EXTR is:

```
$ T4EXTR filespec /CSV=filespec.CSV
```

T4 Extract Example

```
$ dir/since

Directory PARSEC$DRA1:[SAUER]

28-JUL.BIN;1

Total of 1 file.
$ t4extr 28-JUL.BIN;1/csv=28-jul.csv
Program name : T4$MON_EXTRACT, Image file id : X-5 , Link date/time
:  1-OCT-2003 21:19:37.90.
$
$ dir/since

Directory PARSEC$DRA1:[SAUER]

28-JUL.BIN;1        28-JUL.CSV;1

Total of 2 files.
$
```

T4$NOW Example

```
$ @t4$sys:t4$now

Copyright 2000-2003 Hewlett-Packard Development Company, L.P.

Job Entry Number is :  208
Process file T4_PARSEC_28JUL2004_0800_2000_MON Y/[N] ?  y
T4_NOW-I-GEN, generating T4_PARSEC_28JUL2004_0800_1616_Mon.Csv using
T4EXTR - please wait ...
                        o
                        o
                        o
Directory PARSEC$DRA1:[T4]

T4_PARSEC_28JUL2004_0800_1616_MON.CSV;6
                          1079/1080     28-JUL-2004 16:16:45.81

Total of 1 file, 1079/1080 blocks.
T4_NOW-I-COMPLETED, PARSEC$DRA1:[T4]T4_PARSEC_28JUL2004_0800_1616.Csv
has been generated

$
```

Starting and Configuring T4

```
$ @t4$sys:t4$config

Copyright 2000-2003 Hewlett-Packard Development Company, L.P.

Executing T4$CONFIG.COM on node PARSEC - Date/Time is now 26-JUL-
2004 17:45:38.87
Collection Start Time [27-JUL-2004 08:00:00.00]         :
Collection End Time   [27-JUL-2004 20:00:00.00]         :
Batch queue name                          : sys$batch
Network Interface Device (? for list, type RETURN to finish) : ?

Names of Network Interface devices on this system are :-

EWA0:
EWB0:

Network Interface Device (? for list, type RETURN to finish) : ewa0
Network Interface Device (? for list, type RETURN to finish) : ewb0
Network Interface Device (? for list, type RETURN to finish) :
Sampling Interval (seconds) [60]      :
```

Starting and Configuring T4 (Continued)

```
Setting SAMPLING Interval to default of 60
Destination Directory [T4$SYS]        :
Automatically manage T4 data storage        [N] : y
Number of days to retain raw data           [7] :
Number of days to retain intermediate files [3] :
Number of days to retain reduced files   [9999] :
Re-Submit data collection job daily         [N] : y
Email address                                   : sauer@parsec.com
Job T4$COLLECT_V33 (queue SYS$BATCH, entry 206) holding until 27-
JUL-2004 07:58
$
```

Starting and Configuring T4 (Continued)

```
$ show queue sys$batch/full
Batch queue SYS$BATCH, available, on PARSEC::
  /AUTOSTART_ON=(PARSEC::) /BASE_PRIORITY=4 /JOB_LIMIT=4
  /OWNER=[SYSTEM] /PROTECTION=(S:M,O:D,G:R,W:S)

  Entry Jobname         Username             Status
  ----- -------         --------             ------
    206 T4$COLLECT      SAUER                Holding until 27-JUL-
                                              2004 07:58:00
        Submitted 26-JUL-2004 17:46:36.64 /KEEP
        /LOG=PARSEC$DRA1:[T4]T4$COLLECT_PARSEC.LOG; /NOTIFY
        /PARAM=("27-JUL-2004 08:00:00.00","27-JUL-2004 20:00:00.00"
       "SYS$BATCH","ewa0:,ewb0:","SAUER@PARSEC.COM","60",
       "PARSEC$DRA1:[T4]","7,3,9999,Y") /NOPRINT /PRIORITY=100
       /RESTART=SYS$BATCH File: _PARSEC$DRA1:[T4]T4$COLLECT.COM
$
```

T4$COLLECT.COM

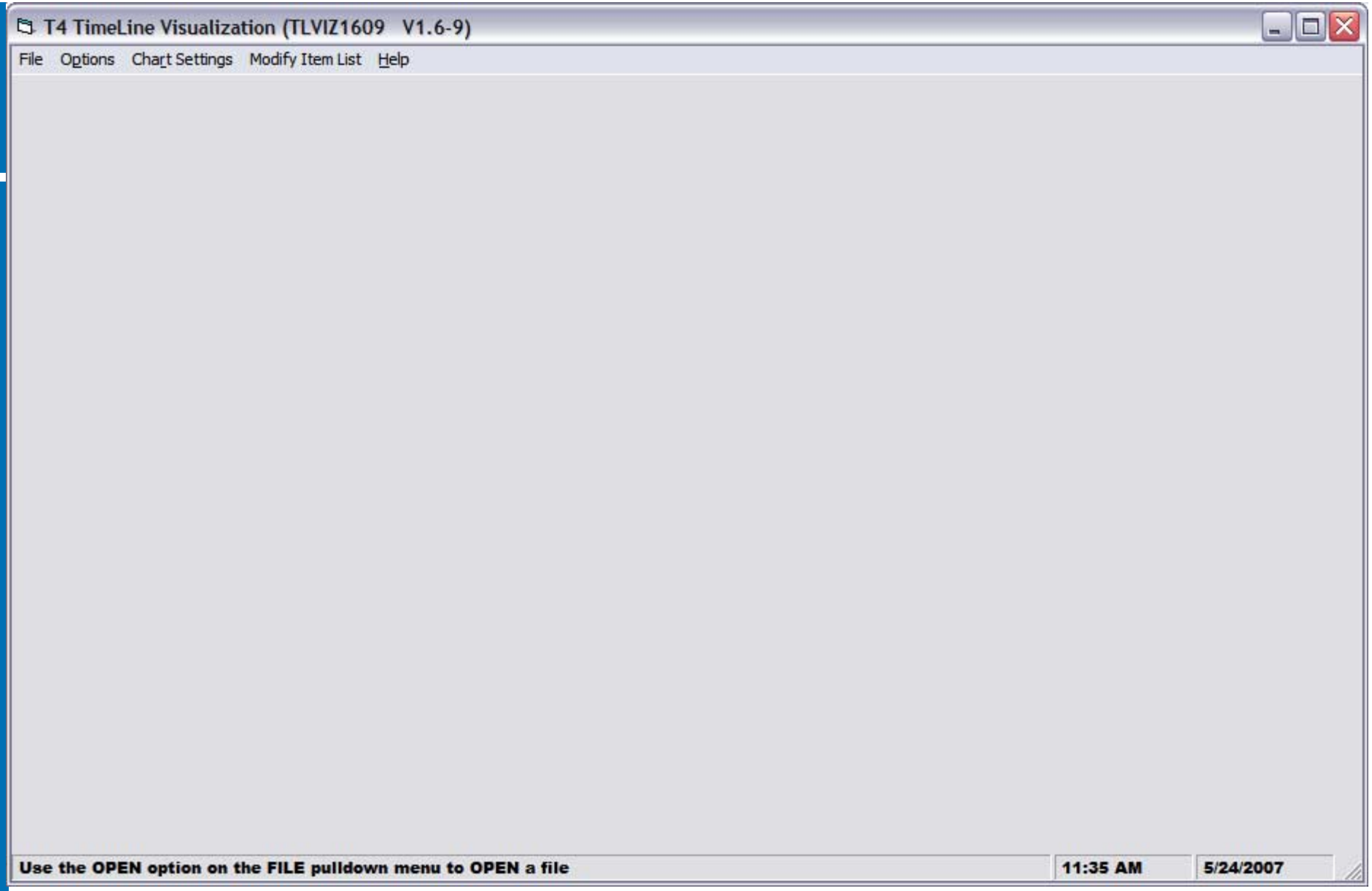
- Was named HP_T4_V32.COM in V32
- Was named T4$COLLECT_V33.COM in V32
- Command procedure that does the actual collection, consolidation, and history creation.
- This command procedure can be modified to fit your needs.
  - For instance, you can extract process data for any process.
  - For example…

```
$ search t4$collect.com shad/wind=10
$Set Command T4$Sys:T4$Mon_Extract
$T4Extr T4_'This_Node'_'Today'_'St_Et'_Mon.Dat -
/Csv_File=T4_'This_Node'_'Today'_'St_Et'_Mon.Csv -
/Class=(All,NoScs,NoDisk,NoRms) -
/Process_Name=("*LMD0*","*SHAD*","*PRODOPER*")
$T4Extr_Status = $Status
$T4Extr T4_'This_Node'_'Today'_'St_Et'_Mon.Dat -
/Csv_File=T4_'This_Node'_'Today'_'St_Et'_Disk.Csv -
/Class=(NoAll,Disk)
$T4Extr_Status = $Status
```

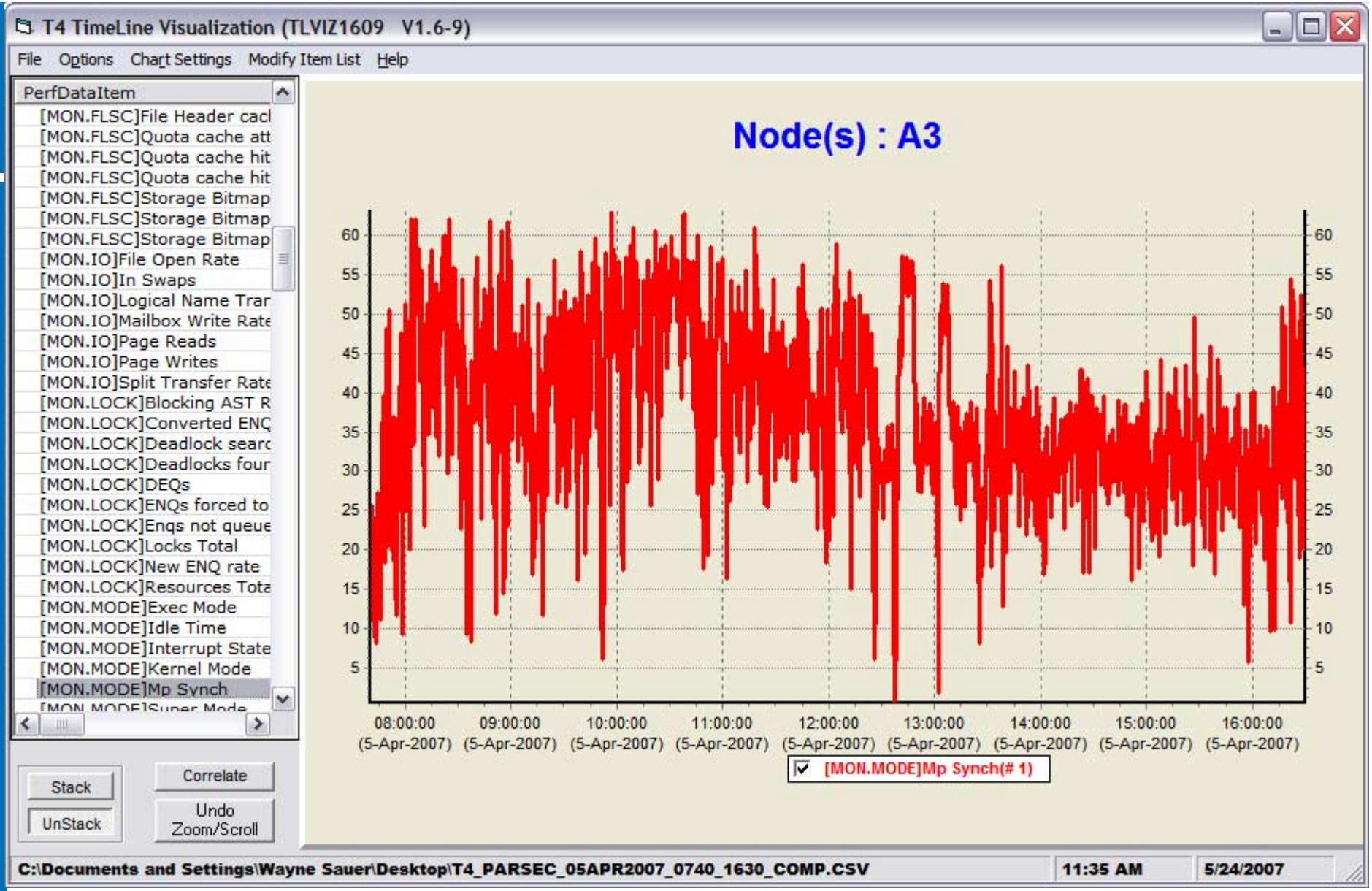
- Edit this file to include the names of the processes that you want to monitor
- For example *ORA* for Oracle processes

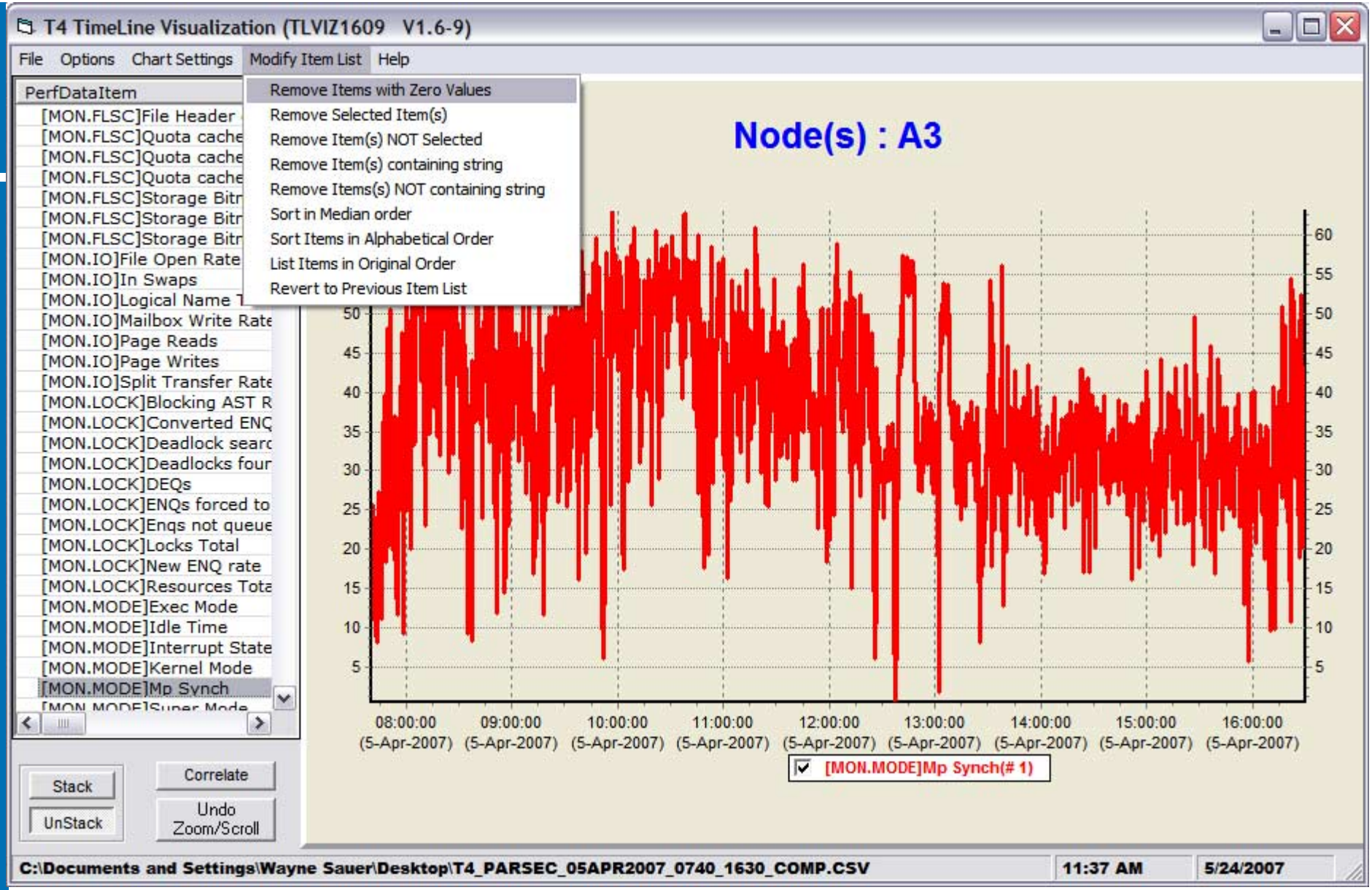
TLViz reference

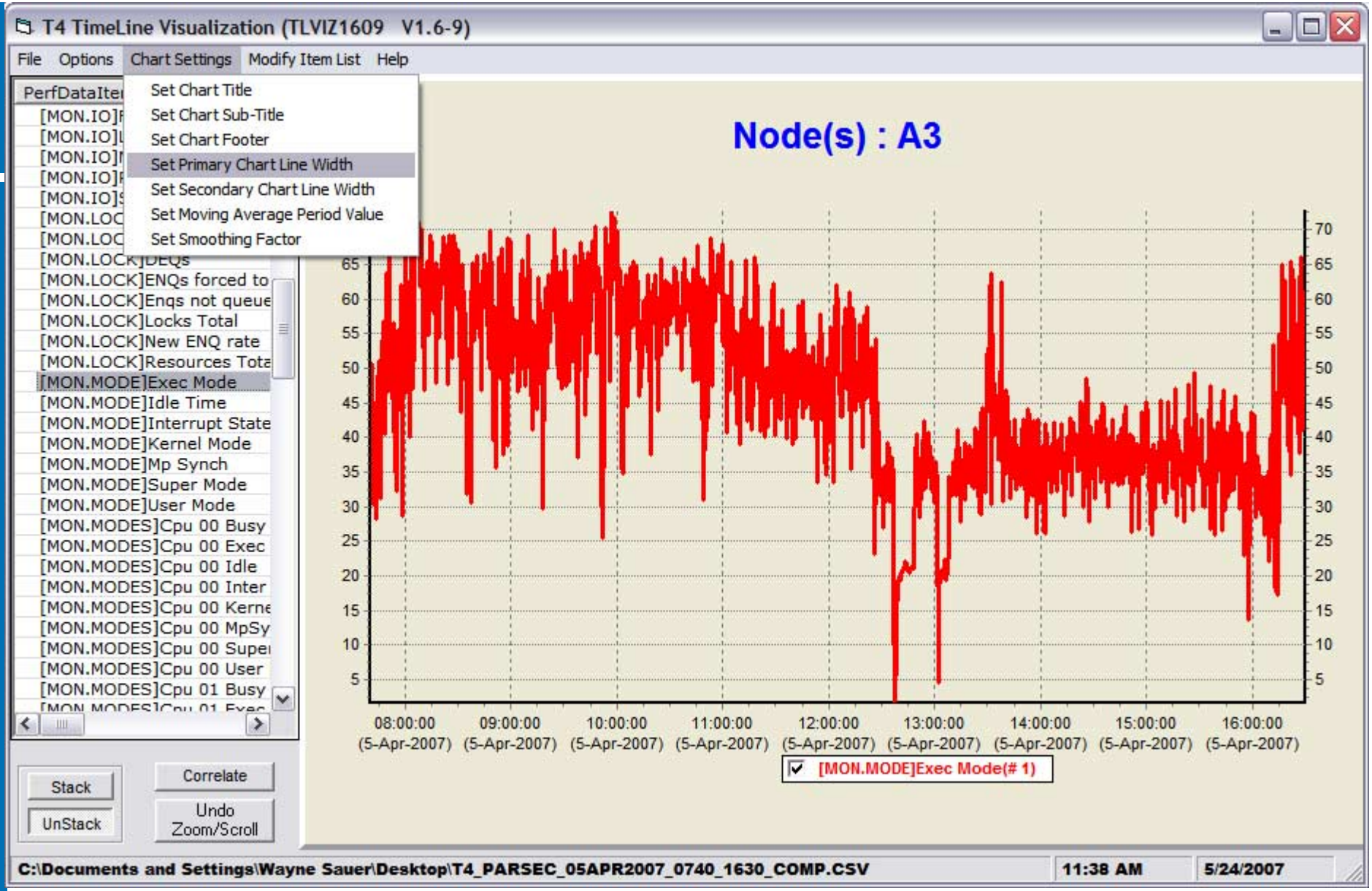
- TLViz (Time Line Vizualizer) is an HP internal tool, developed and used by OpenVMS Engineering to simplify and dramatically speed up the analysis of T4 style CSV files.
- TLViz is a Windows NT PC utility (written in Visual Basic) that allows you to quickly generate performance graphs using T4 generated CSV files
- Download the latest version from **http://h71000.www7.hp.com/OpenVMS/products/t4/index.html**
- The following example illustrates the use of TLViz

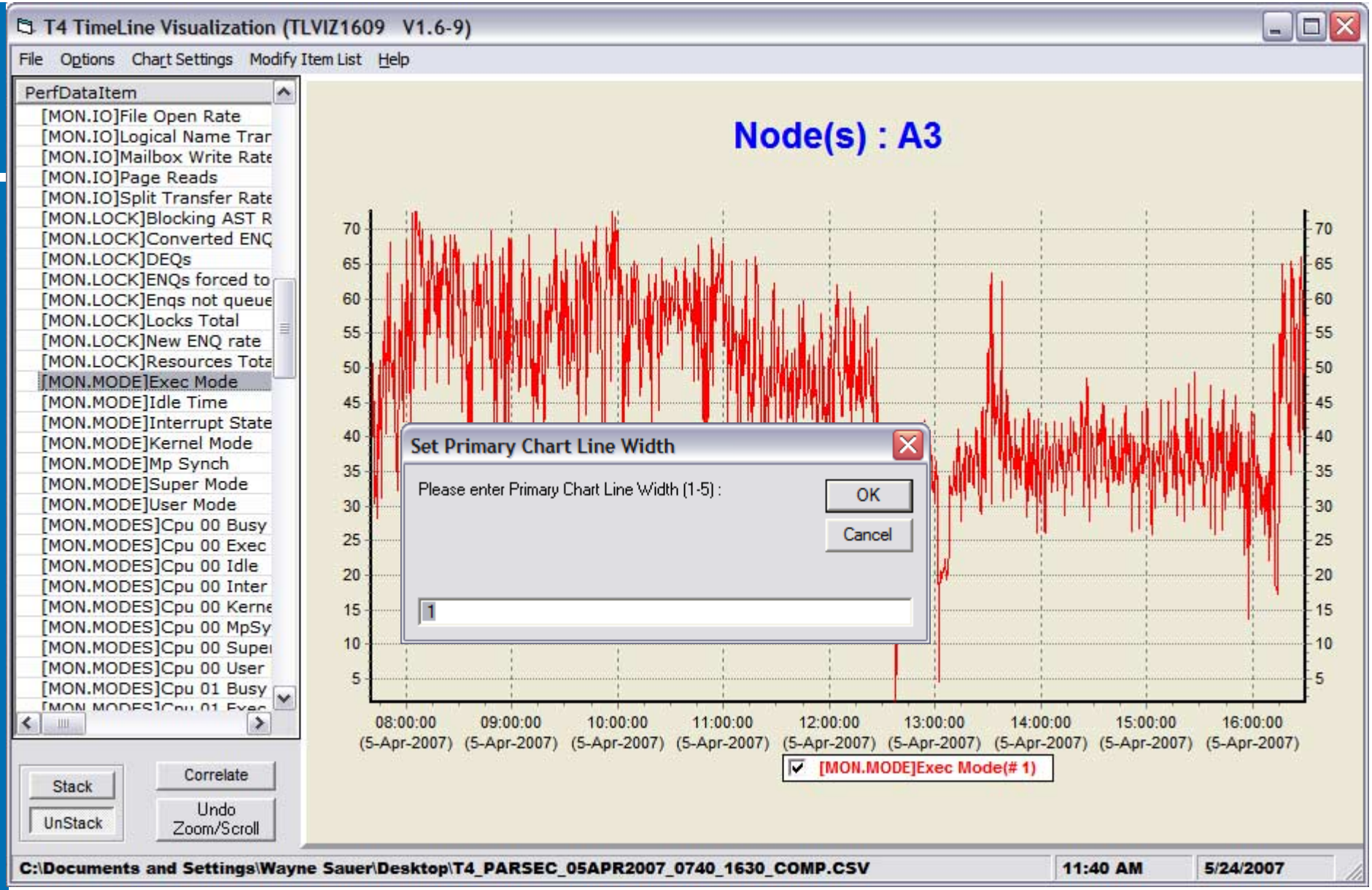


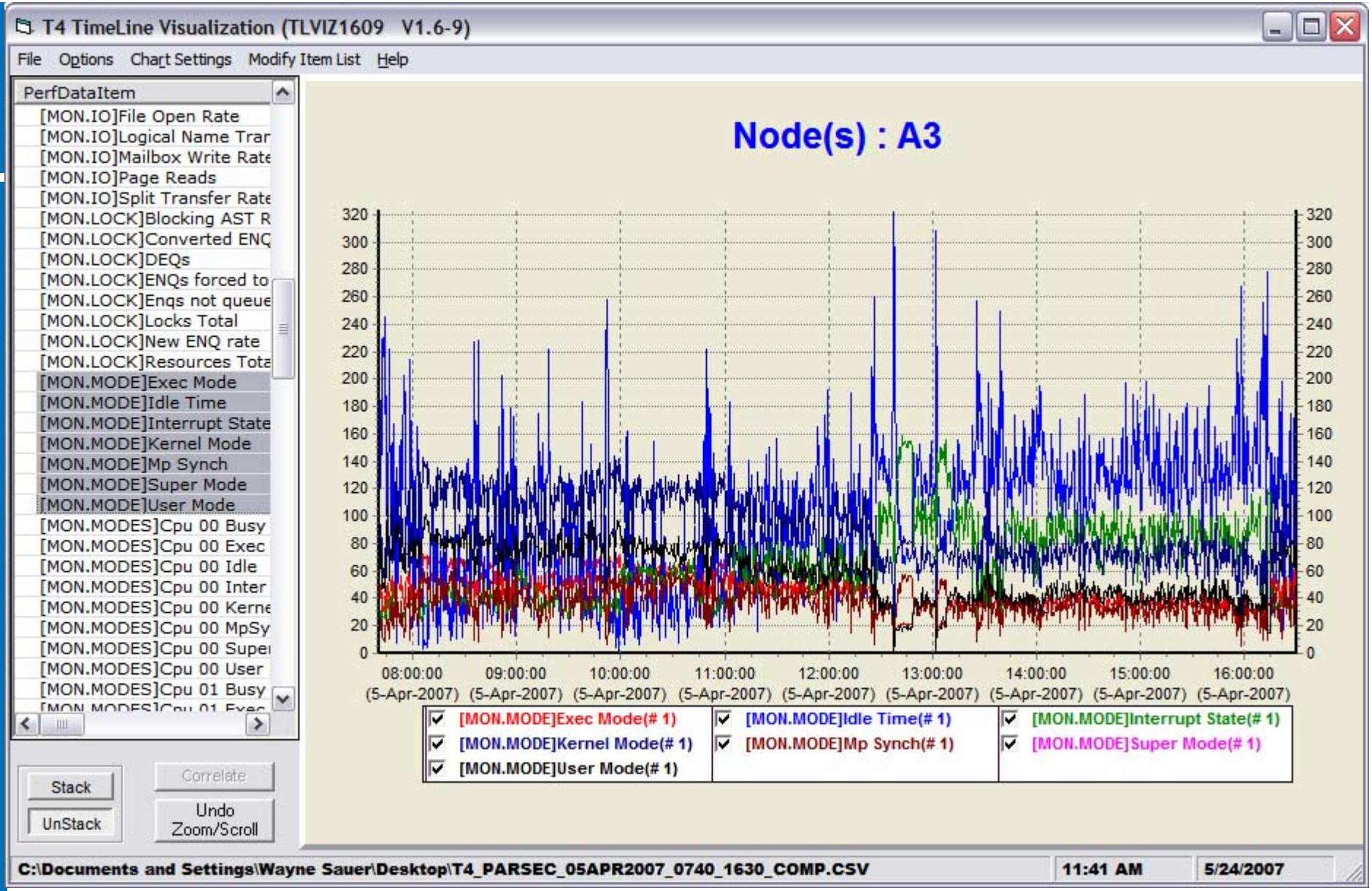
Click on File, and select the Open option. Goes through the standard open dialogue box


T4 TimeLine Visualization (TLVIZ1609 V1.6-9)
File
Options
Chart Settings
Modify Item List
Help
PerfDataItem
[MON.FLSC]File Header cacl
[MON.FLSC]Quota cache att
[MON.FLSC]Quota cache hit
[MON.FLSC]Quota cache hit
[MON.FLSC]Storage Bitmap
[MON.FLSC]Storage Bitmap
[MON.FLSC]Storage Bitmap
[MON.IO]File Open Rate
[MON.IO]In Swaps
[MON.IO]Logical Name Trar
[MON.IO]Mailbox Write Rate
[MON.IO]Page Reads
[MON.IO]Page Writes
[MON.IO]Split Transfer Rate
[MON.LOCK]Blocking AST R
[MON.LOCK]Converted ENQ
[MON.LOCK]Deadlock searc
[MON.LOCK]Deadlocks four
[MON.LOCK]DEQs
[MON.LOCK]ENQs forced to
[MON.LOCK]Enqs not queue
[MON.LOCK]Locks Total
[MON.LOCK]New ENQ rate
[MON.LOCK]Resources Tota
[MON.MODE]Exec Mode
[MON.MODE]Idle Time
[MON.MODE]Interrupt State
[MON.MODE]Kernel Mode
[MON.MODE]Mp Synch
Node(s) : A3
60
55
50
45
40
35
30
25
20
15
10
5
08:00:00 (5-Apr-2007)
09:00:00 (5-Apr-2007)
10:00:00 (5-Apr-2007)
11:00:00 (5-Apr-2007)
12:00:00 (5-Apr-2007)
13:00:00 (5-Apr-2007)
14:00:00 (5-Apr-2007)
15:00:00 (5-Apr-2007)
16:00:00 (5-Apr-2007)
[MON.MODE]Mp Synch(# 1)
Stack
UnStack
Correlate
Undo Zoom/Scroll
C:\Documents and Settings\Wayne Sauer\Desktop\T4_PARSEC_05APR2007_0740_1630_COMP.CSV
11:35 AM
5/24/2007

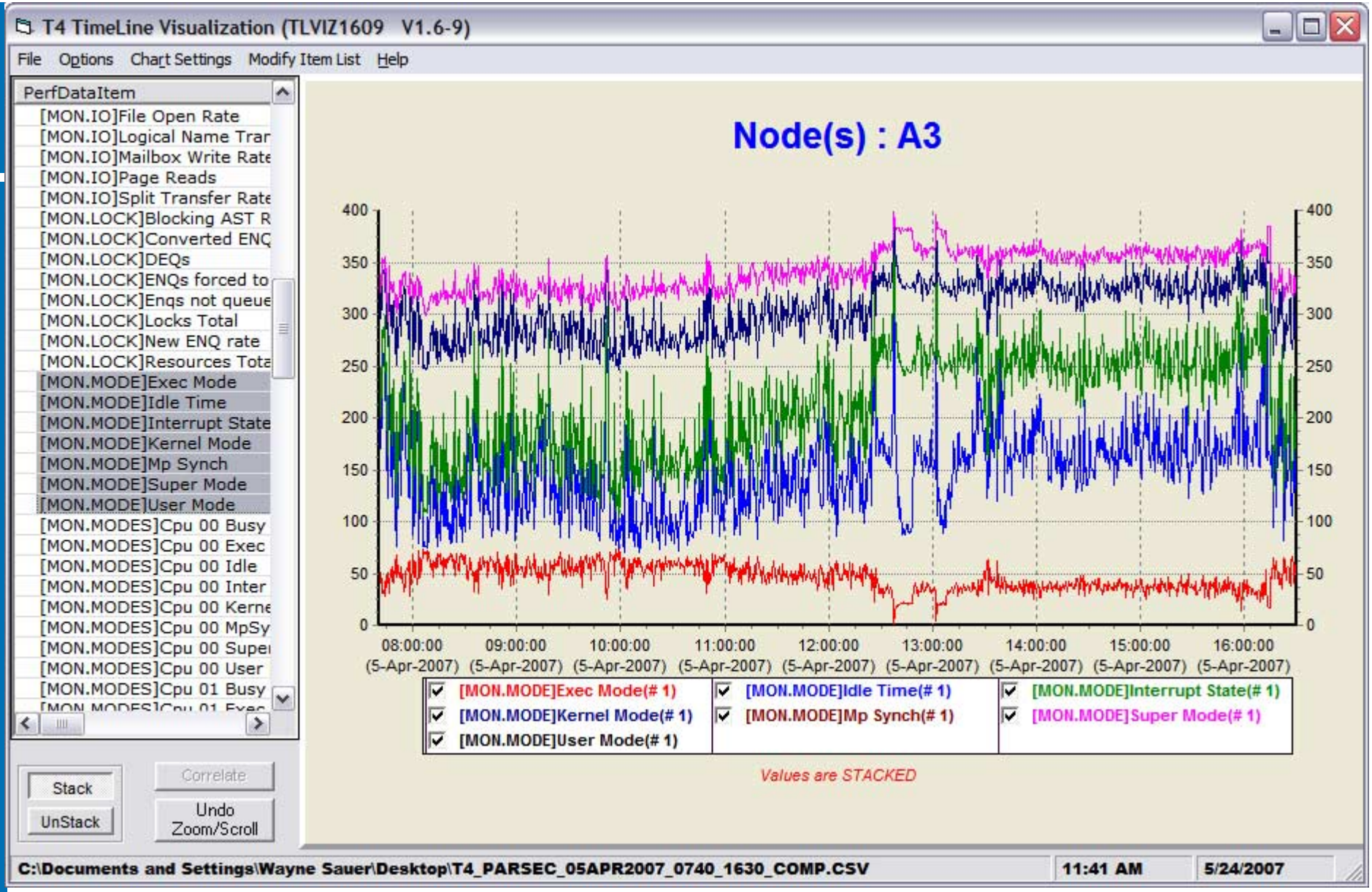

T4 TimeLine Visualization (TLVIZ1609 V1.6-9)
File
Options
Chart Settings
Modify Item List
Help
Remove Items with Zero Values
Remove Selected Item(s)
Remove Item(s) NOT Selected
Remove Item(s) containing string
Remove Items(s) NOT containing string
Sort in Median order
Sort Items in Alphabetical Order
List Items in Original Order
Revert to Previous Item List
PerfDataItem
[MON.FLSC]File Header
[MON.FLSC]Quota cache
[MON.FLSC]Quota cache
[MON.FLSC]Quota cache
[MON.FLSC]Storage Bitr
[MON.FLSC]Storage Bitr
[MON.FLSC]Storage Bitr
[MON.IO]File Open Rate
[MON.IO]In Swaps
[MON.IO]Logical Name T
[MON.IO]Mailbox Write Rate
[MON.IO]Page Reads
[MON.IO]Page Writes
[MON.IO]Split Transfer Rate
[MON.LOCK]Blocking AST R
[MON.LOCK]Converted ENQ
[MON.LOCK]Deadlock searc
[MON.LOCK]Deadlocks four
[MON.LOCK]DEQs
[MON.LOCK]ENQs forced to
[MON.LOCK]Enqs not queue
[MON.LOCK]Locks Total
[MON.LOCK]New ENQ rate
[MON.LOCK]Resources Tota
[MON.MODE]Exec Mode
[MON.MODE]Idle Time
[MON.MODE]Interrupt State
[MON.MODE]Kernel Mode
[MON.MODE]Mp Synch
Node(s) : A3
60
55
50
45
40
35
30
25
20
15
10
5
08:00:00 (5-Apr-2007)
09:00:00 (5-Apr-2007)
10:00:00 (5-Apr-2007)
11:00:00 (5-Apr-2007)
12:00:00 (5-Apr-2007)
13:00:00 (5-Apr-2007)
14:00:00 (5-Apr-2007)
15:00:00 (5-Apr-2007)
16:00:00 (5-Apr-2007)
[MON.MODE]Mp Synch(# 1)
Stack
UnStack
Correlate
Undo Zoom/Scroll
C:\Documents and Settings\Wayne Sauer\Desktop\T4_PARSEC_05APR2007_0740_1630_COMP.CSV
11:37 AM
5/24/2007

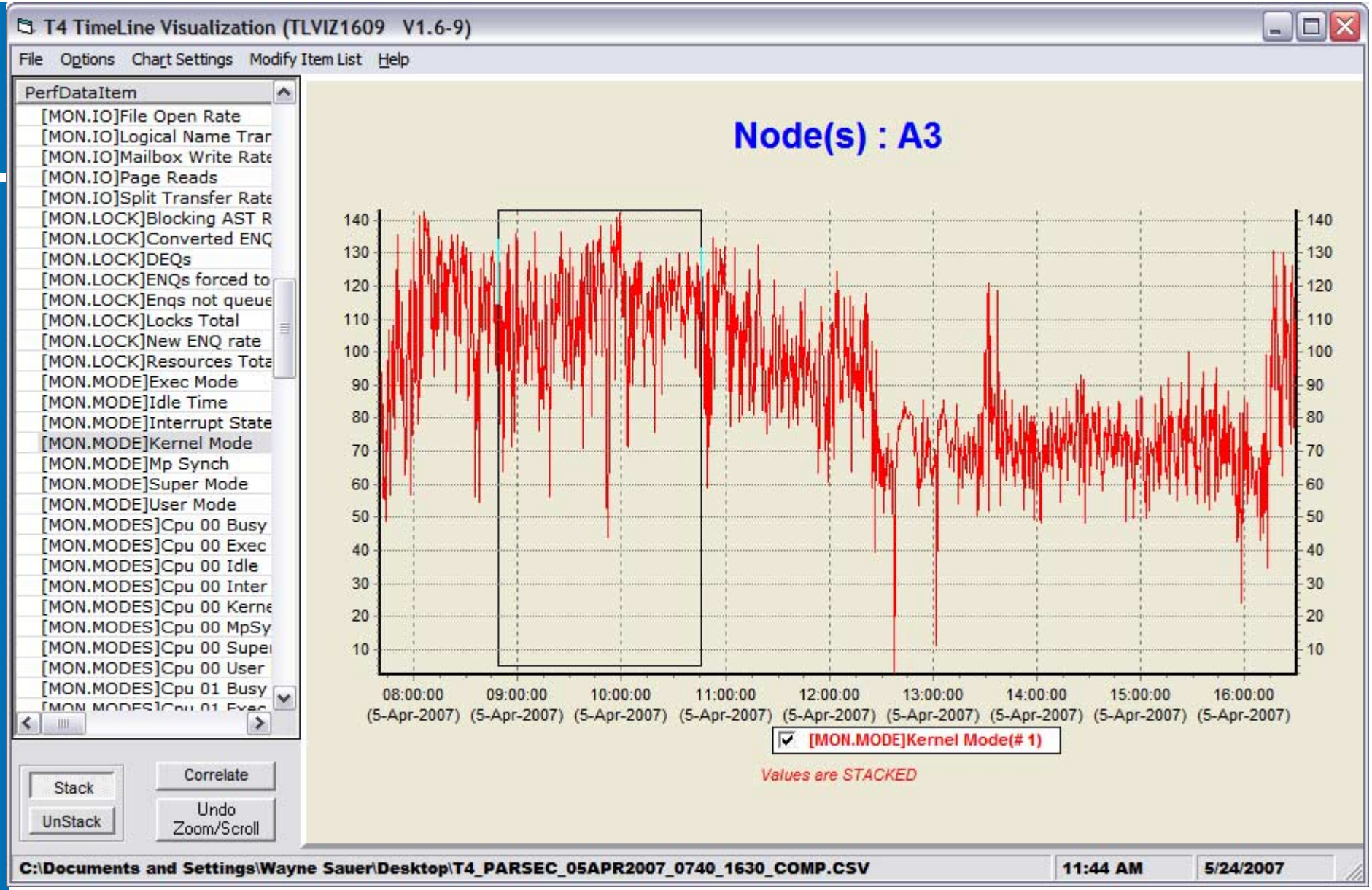

T4 TimeLine Visualization (TLVIZ1609 V1.6-9)
File
Options
Chart Settings
Modify Item List
Help
Set Chart Title
Set Chart Sub-Title
Set Chart Footer
Set Primary Chart Line Width
Set Secondary Chart Line Width
Set Moving Average Period Value
Set Smoothing Factor
PerfDataIte
[MON.IO]
[MON.LOC
[MON.LOCK]DEQs
[MON.LOCK]ENQs forced to
[MON.LOCK]Enqs not queue
[MON.LOCK]Locks Total
[MON.LOCK]New ENQ rate
[MON.LOCK]Resources Tota
[MON.MODE]Exec Mode
[MON.MODE]Idle Time
[MON.MODE]Interrupt State
[MON.MODE]Kernel Mode
[MON.MODE]Mp Synch
[MON.MODE]Super Mode
[MON.MODE]User Mode
[MON.MODES]Cpu 00 Busy
[MON.MODES]Cpu 00 Exec
[MON.MODES]Cpu 00 Idle
[MON.MODES]Cpu 00 Inter
[MON.MODES]Cpu 00 Kerne
[MON.MODES]Cpu 00 MpSy
[MON.MODES]Cpu 00 Super
[MON.MODES]Cpu 00 User
[MON.MODES]Cpu 01 Busy
Stack
UnStack
Correlate
Undo Zoom/Scroll
Node(s) : A3
70
65
60
55
50
45
40
35
30
25
20
15
10
5
08:00:00 (5-Apr-2007)
09:00:00 (5-Apr-2007)
10:00:00 (5-Apr-2007)
11:00:00 (5-Apr-2007)
12:00:00 (5-Apr-2007)
13:00:00 (5-Apr-2007)
14:00:00 (5-Apr-2007)
15:00:00 (5-Apr-2007)
16:00:00 (5-Apr-2007)
[MON.MODE]Exec Mode(# 1)
C:\Documents and Settings\Wayne Sauer\Desktop\T4_PARSEC_05APR2007_0740_1630_COMP.CSV
11:38 AM
5/24/2007


T4 TimeLine Visualization (TLVIZ1609 V1.6-9)
File Options Chart Settings Modify Item List Help
PerfDataItem
[MON.IO]File Open Rate
[MON.IO]Logical Name Trar
[MON.IO]Mailbox Write Rate
[MON.IO]Page Reads
[MON.IO]Split Transfer Rate
[MON.LOCK]Blocking AST R
[MON.LOCK]Converted ENQ
[MON.LOCK]DEQs
[MON.LOCK]ENQs forced to
[MON.LOCK]Enqs not queue
[MON.LOCK]Locks Total
[MON.LOCK]New ENQ rate
[MON.LOCK]Resources Tota
[MON.MODE]Exec Mode
[MON.MODE]Idle Time
[MON.MODE]Interrupt State
[MON.MODE]Kernel Mode
[MON.MODE]Mp Synch
[MON.MODE]Super Mode
[MON.MODE]User Mode
[MON.MODES]Cpu 00 Busy
[MON.MODES]Cpu 00 Exec
[MON.MODES]Cpu 00 Idle
[MON.MODES]Cpu 00 Inter
[MON.MODES]Cpu 00 Kerne
[MON.MODES]Cpu 00 MpSy
[MON.MODES]Cpu 00 Super
[MON.MODES]Cpu 00 User
[MON.MODES]Cpu 01 Busy
Node(s) : A3
70 65 60 55 50 45 40 35 30 25 20 15 10 5
08:00:00 (5-Apr-2007)
09:00:00 (5-Apr-2007)
10:00:00 (5-Apr-2007)
11:00:00 (5-Apr-2007)
12:00:00 (5-Apr-2007)
13:00:00 (5-Apr-2007)
14:00:00 (5-Apr-2007)
15:00:00 (5-Apr-2007)
16:00:00 (5-Apr-2007)
[MON.MODE]Exec Mode(# 1)
Set Primary Chart Line Width
Please enter Primary Chart Line Width (1-5) :
OK
Cancel
1
Stack
UnStack
Correlate
Undo Zoom/Scroll
C:\Documents and Settings\Wayne Sauer\Desktop\T4_PARSEC_05APR2007_0740_1630_COMP.CSV
11:40 AM
5/24/2007

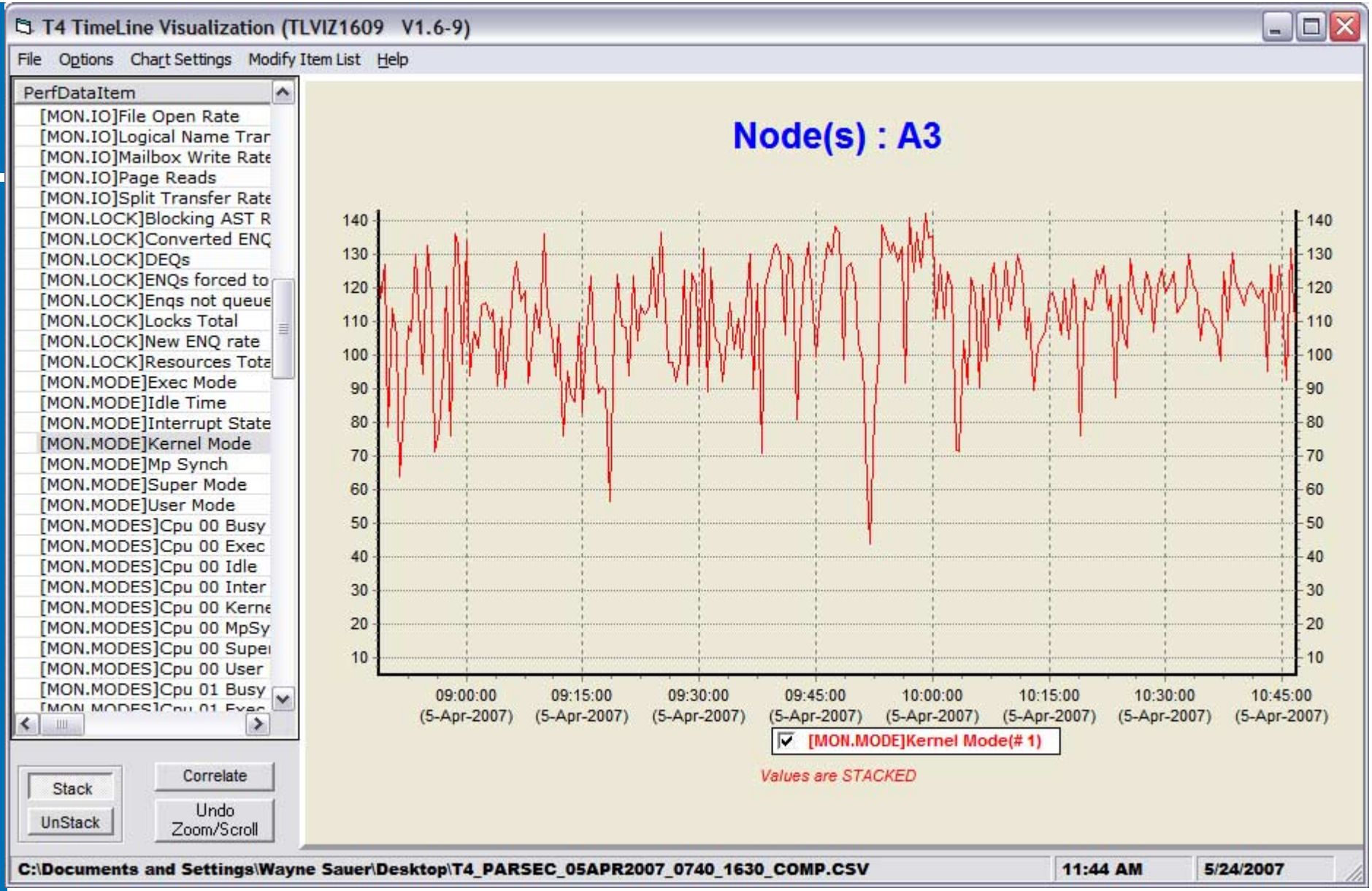


Selecting multiple items adds them to the graph

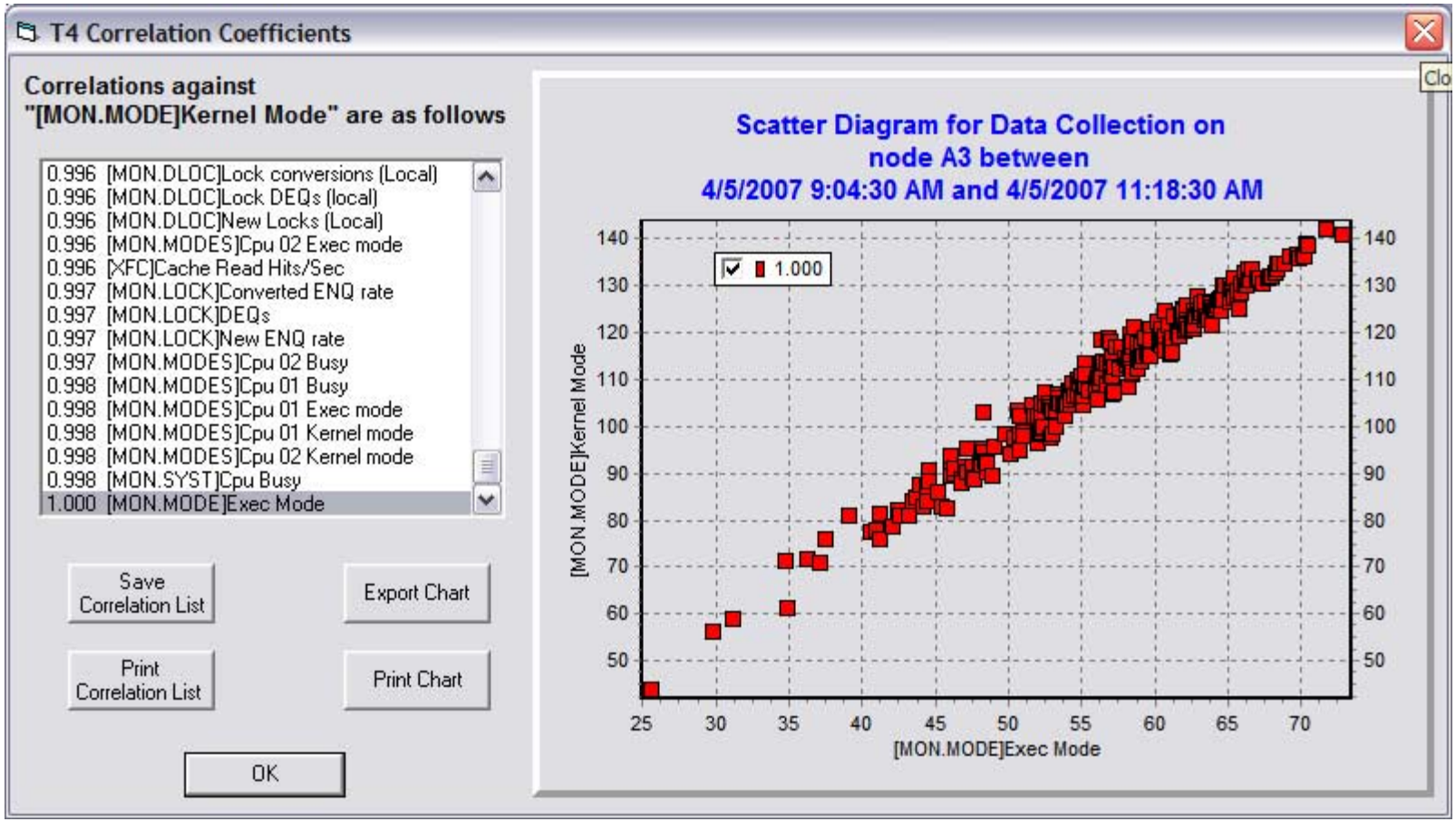

T4 TimeLine Visualization (TLVIZ1609 V1.6-9)
File
Options
Chart Settings
Modify Item List
Help
PerfDataItem
[MON.IO]File Open Rate
[MON.IO]Logical Name Trar
[MON.IO]Mailbox Write Rate
[MON.IO]Page Reads
[MON.IO]Split Transfer Rate
[MON.LOCK]Blocking AST R
[MON.LOCK]Converted ENQ
[MON.LOCK]DEQs
[MON.LOCK]ENQs forced to
[MON.LOCK]Enqs not queue
[MON.LOCK]Locks Total
[MON.LOCK]New ENQ rate
[MON.LOCK]Resources Tota
[MON.MODE]Exec Mode
[MON.MODE]Idle Time
[MON.MODE]Interrupt State
[MON.MODE]Kernel Mode
[MON.MODE]Mp Synch
[MON.MODE]Super Mode
[MON.MODE]User Mode
[MON.MODES]Cpu 00 Busy
[MON.MODES]Cpu 00 Exec
[MON.MODES]Cpu 00 Idle
[MON.MODES]Cpu 00 Inter
[MON.MODES]Cpu 00 Kerne
[MON.MODES]Cpu 00 MpSy
[MON.MODES]Cpu 00 Super
[MON.MODES]Cpu 00 User
[MON.MODES]Cpu 01 Busy
Stack
UnStack
Correlate
Undo Zoom/Scroll
Node(s) : A3
400
350
300
250
200
150
100
50
0
08:00:00 (5-Apr-2007)
09:00:00 (5-Apr-2007)
10:00:00 (5-Apr-2007)
11:00:00 (5-Apr-2007)
12:00:00 (5-Apr-2007)
13:00:00 (5-Apr-2007)
14:00:00 (5-Apr-2007)
15:00:00 (5-Apr-2007)
16:00:00 (5-Apr-2007)
[MON.MODE]Exec Mode(# 1)
[MON.MODE]Idle Time(# 1)
[MON.MODE]Interrupt State(# 1)
[MON.MODE]Kernel Mode(# 1)
[MON.MODE]Mp Synch(# 1)
[MON.MODE]Super Mode(# 1)
[MON.MODE]User Mode(# 1)
Values are STACKED
C:\Documents and Settings\Wayne Sauer\Desktop\T4_PARSEC_05APR2007_0740_1630_COMP.CSV
11:41 AM
5/24/2007



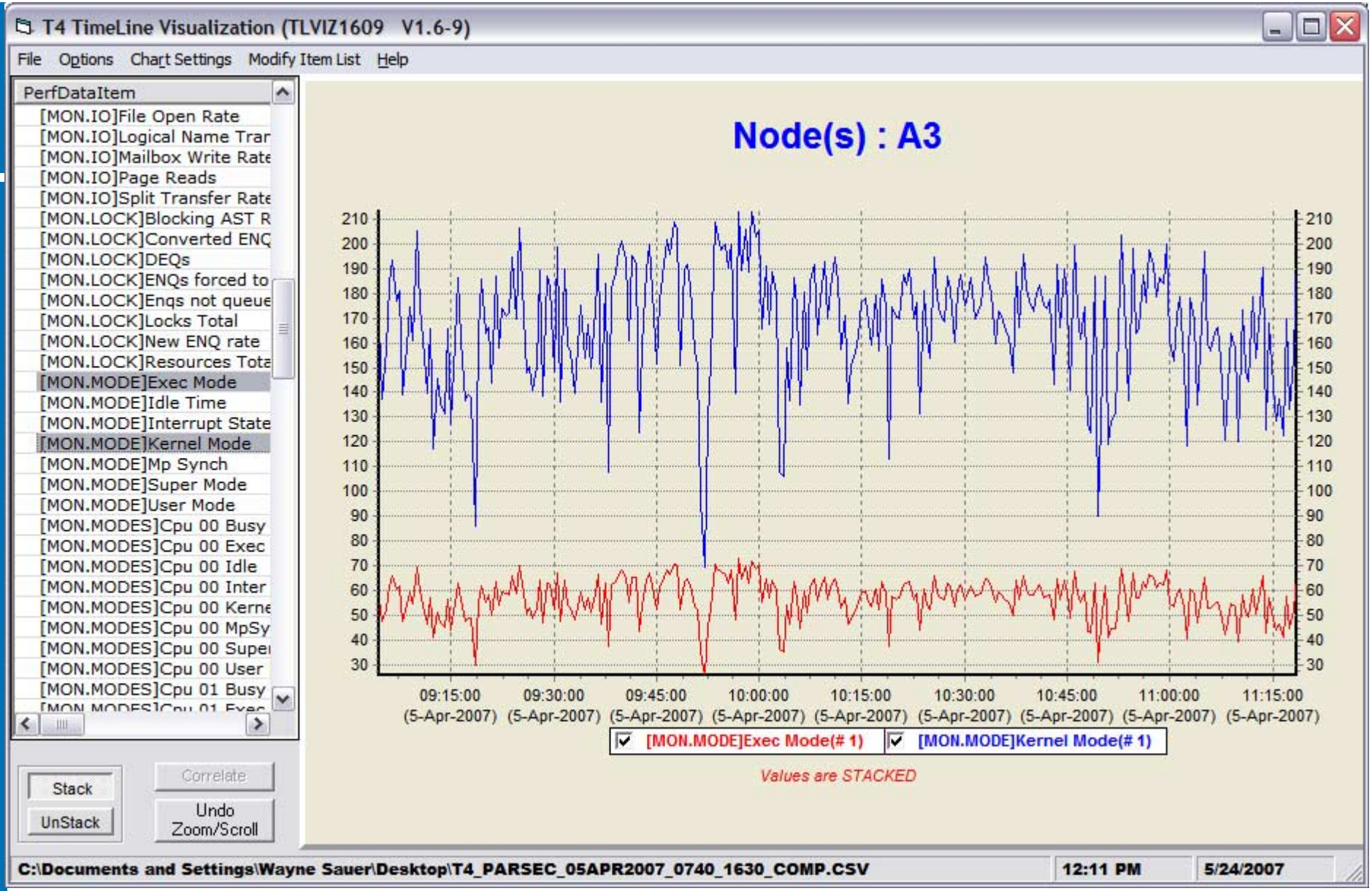
Highlighting a section of the graph will expand it



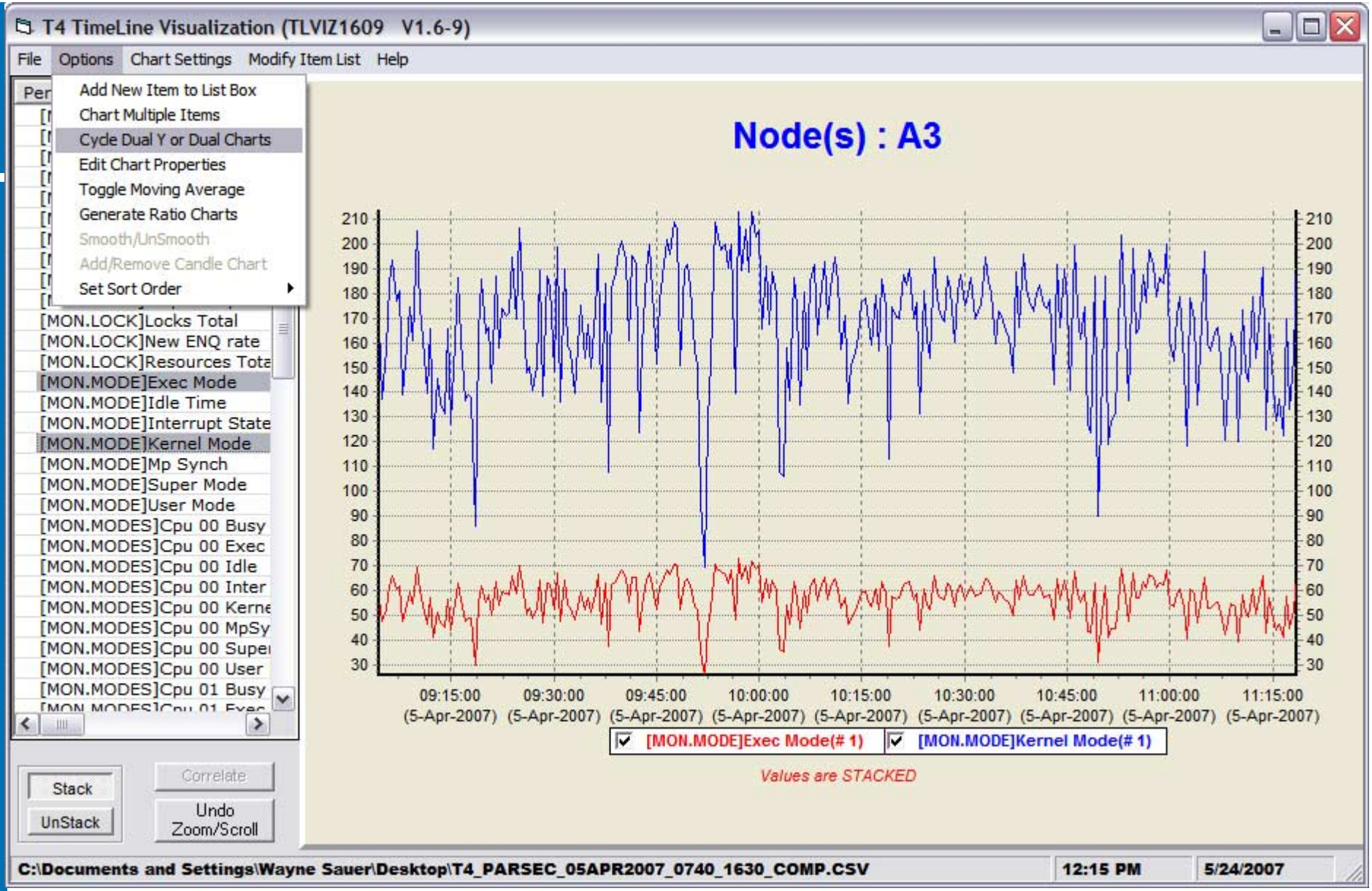
Clicking on the correlate button allows you to correlate graphs
Clicking on the Undo Zoom/Scroll button will bring back the original graph



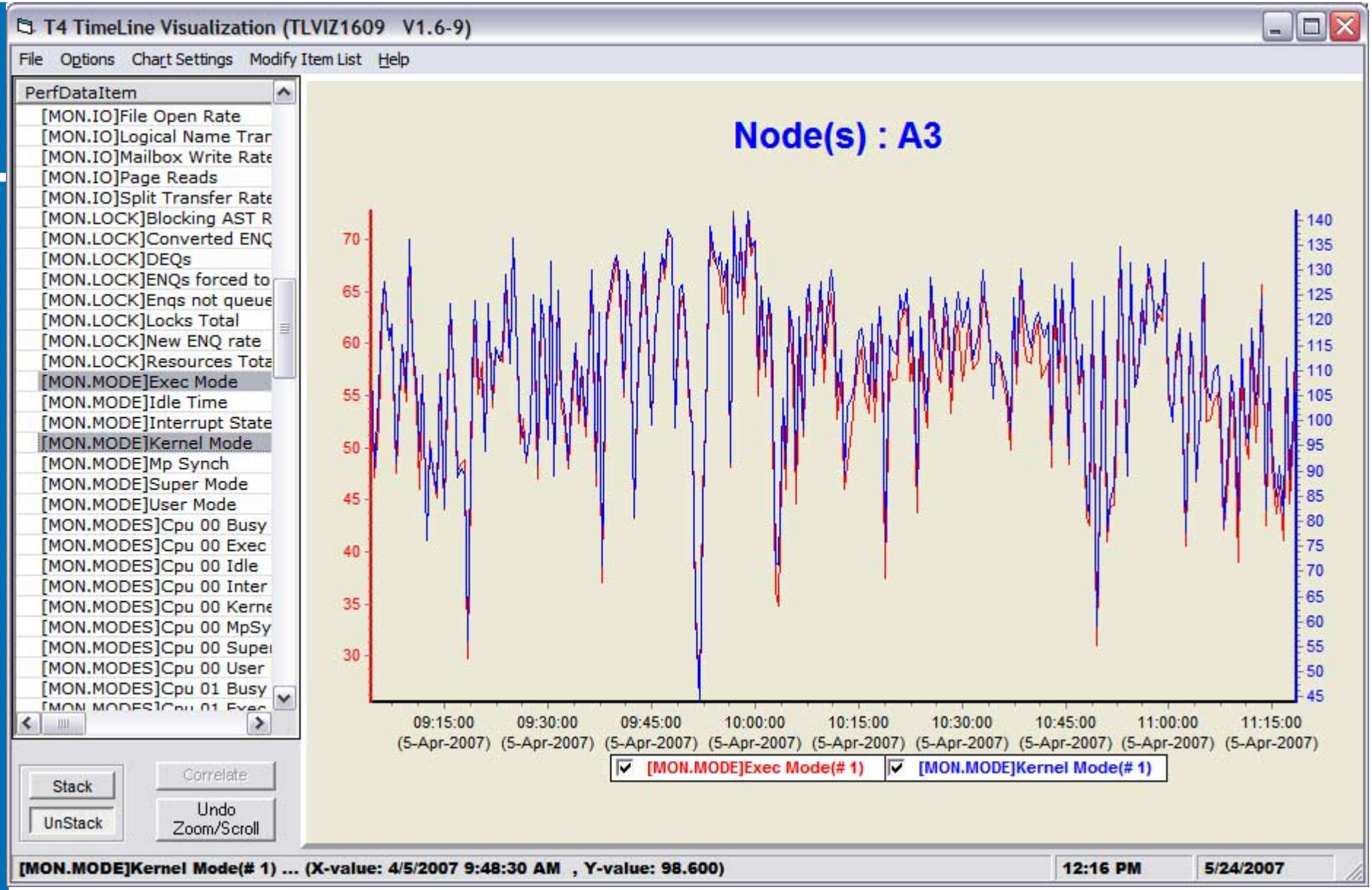
- The items in the scroll box are all of the items that correlated to the graph
- Clicking on an item will show you the correlation between the original graph and the selected item
- Notice that Executive mode is a 100% correlation



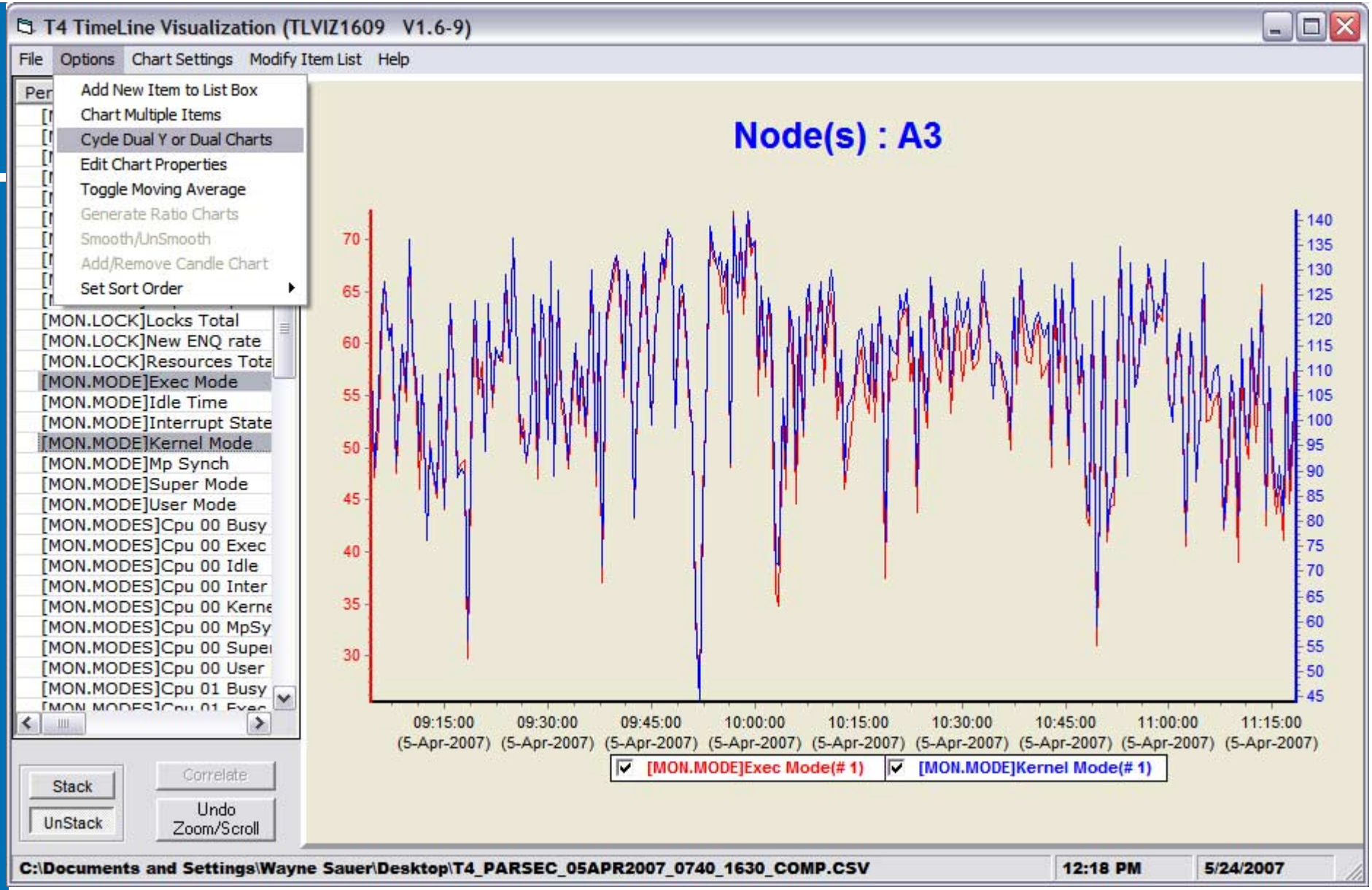
Holding the control key and selecting executive mode will show both modes. Notice that they have different scales.



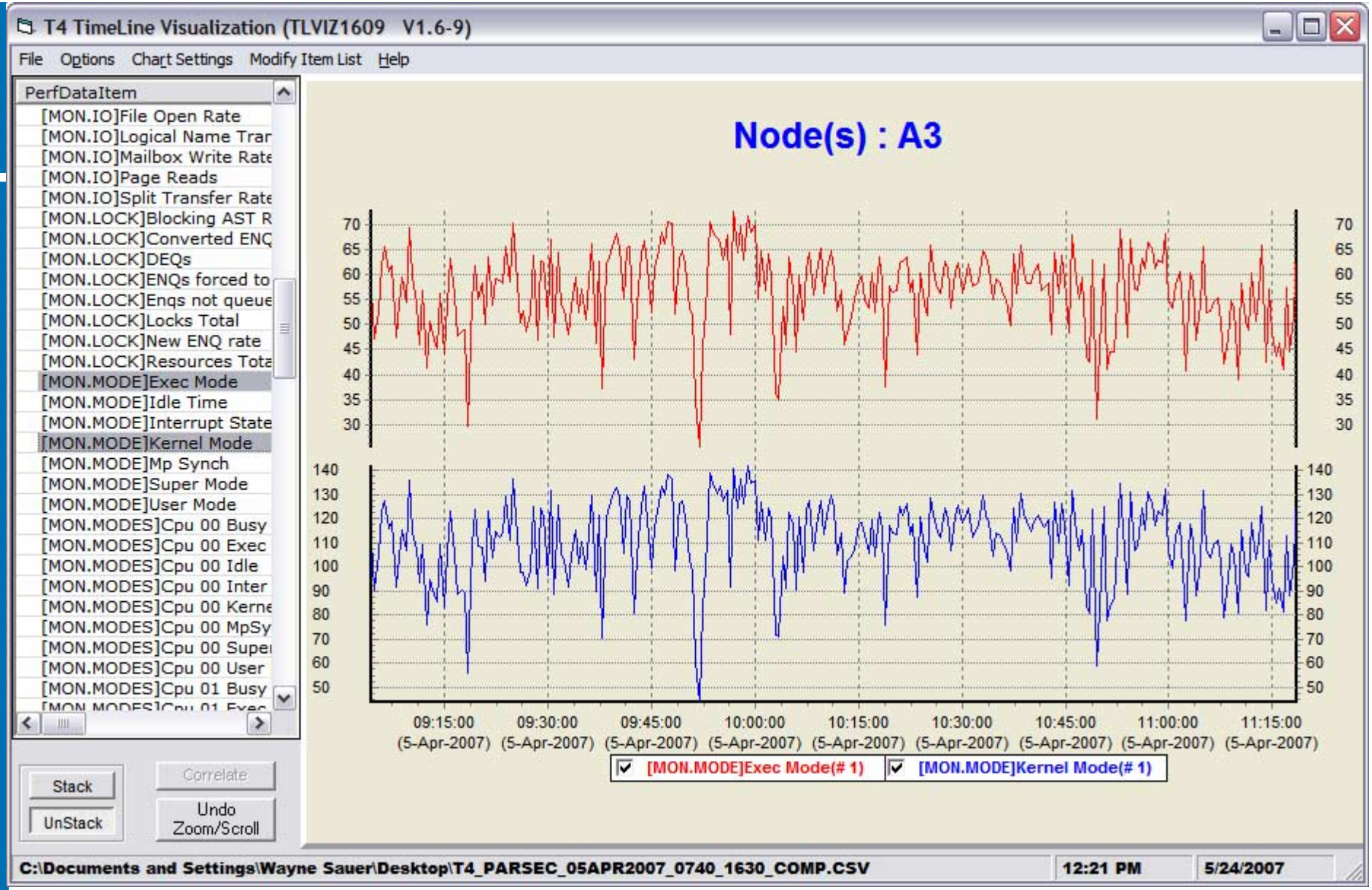
Selecting “Cycle Dual Y or Dual Charts” the first time will float the Y Axis as follows.



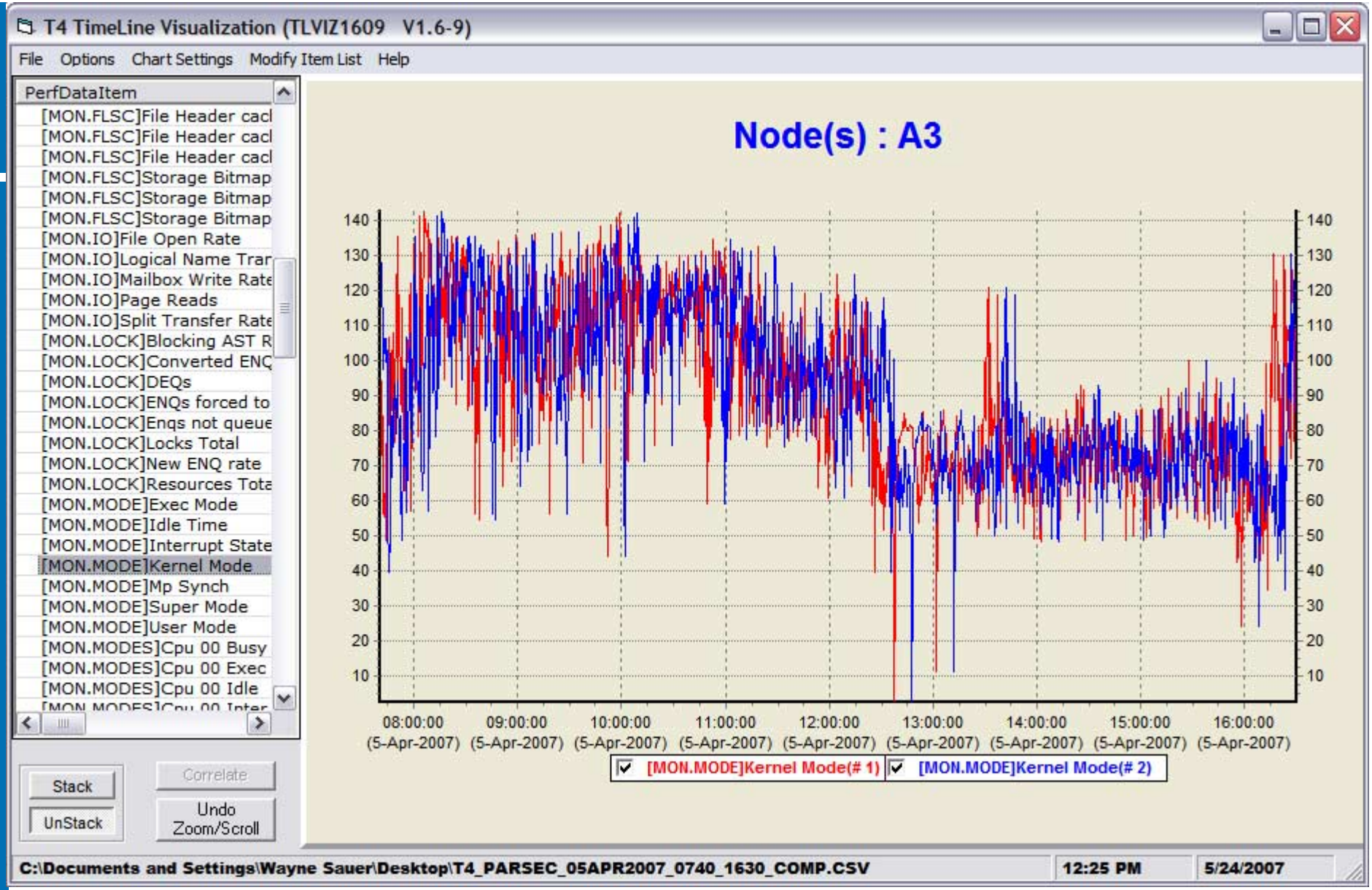
Notice that the Y axis for both modes has different scales. This makes it easier to compare graphs.



Selecting “Cycle Dual Y or Dual Charts” the second time will create two separate graphs, one on top of the other as follows.



This often makes it easier to compare graphs. Floating the Y axis and having graphs one on top of another can only be done with two graph selections.
Selecting “Cycle Dual Y or Dual Charts” again reverts to the original graphs.



Opening two CSV files will allow you to do side by side comparisons of either two different systems or performance changes over time on the same system.

Questions??

Wayne Sauer
PARSEC Group
sauer@parsec.com
www.parsec.com
888-4-PARSEC

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The MONITOR Utility

- The Monitor utility is part of OpenVMS and can display system statistics on an ongoing basis.
- It does not have the ability to show trends or graph historical data
- It is best used to look at a live system for performance problems
- Can create binary recording files, which can
  - Be played back, possibly at a different interval
  - Converted to CSV files by an hp supplied utility for analysis using T4 (discussed later)

The MONITOR Utility (Continued)

- The Monitor utility has the following command syntax:

  MONITOR [/command qualifier[,...]] classname[,...] [/classname-qualifier[,...]]

- The following are useful Monitor qualifiers
  - /BEGINNING – Start time
  - /ENDING – End time
  - /BY_NODE – Displays performance data by node
  - /[NO]DISPLAY – Specify /nodisplay when in batch mode
  - /INPUT – Input recording file
  - /INTERVAL – Sampling interval
  - /RECORD – Create an output binary recording file
  - /SUMMARY – Summarizes monitor data

The MONITOR Utility (Continued)

- The following classes can be specified via the Monitor utility:
  - ALL_CLASSES
  - DISK
  - CLUSTER
  - LOCK
  - PAGE
  - RMS
  - SYSTEM
  - VBS
  - FILE_SYSTEM_CACHE
  - DLOCK
  - IO
  - MODES
  - STATES
  - SCS
  - TIMER
  - VECTOR
  - FCP
  - DECNET
  - MSCP_SERVER
  - RLOCK
  - PROCESSES
  - TRANSACTION

Recording and Playing Back Monitor Data

- To record data:

  $ **MONITOR/RECORD=file-spec –**
  /INTERVAL=n/NODISPLAY-
  /ENDING=time class[,class...]

- To playback data:

  $ **MONITOR/INPUT=file-spec[/INTERVAL=n] class**

- There is a sample recording set of command procedures in SYS$EXAMPLES
  - MONITOR.COM
  - MONSUM.COM
  - SUBMON.COM

The Accounting Utility

- The accounting utility is made up of termination records that are written to SYS$MANAGER:ACCOUNTNG.DAT
- By default all accounting is enabled except image accounting
- There is performance related data in the image accounting termination record
- T4 uses the accounting file to gather login, logout, and process lifetime statistics

Managing the Accounting Utility

- To enable accounting:

  ```
  $ set accounting/enable=[keyword]
  ```

- To disable accounting

  ```
  $ set accounting/disable=[keyword]
  ```

- To determine what accounting is enabled

  ```
  $ show accounting
  ```

- To generate an accounting report

  ```
  $ accounting/qualifiers  accounting-
    filespec
  ```

```
$ show accounting
Accounting is currently enabled to log the following activities:

      PROCESS         any process termination
      INTERACTIVE     interactive job termination
      LOGIN_FAILURE   login failures
      SUBPROCESS      subprocess termination
      DETACHED        detached job termination
      BATCH           batch job termination
      NETWORK         network job termination
      PRINT           all print jobs
      MESSAGE         user messages
$ set accounting/enable=image
$ show accounting
Accounting is currently enabled to log the following activities:

      PROCESS         any process termination
      IMAGE           image execution
      INTERACTIVE     interactive job termination
      LOGIN_FAILURE   login failures
      SUBPROCESS      subprocess termination
      DETACHED        detached job termination
      BATCH           batch job termination
      NETWORK         network job termination
      PRINT           all print jobs
      MESSAGE         user messages
$ set accounting/disable=image
```

```
$ accounting/since=today/full
DETACHED Process Termination
----------------------------
Username:          APACHE$WWW    UIC:              [AP_HTTPD,APACHE$WWW]
Account:           AP_HTTPD      Finish time:      22-JUL-2004 00:00:00.82
Process ID:        00000887      Start time:       21-JUL-2004 12:50:45.55
Owner ID:                        Elapsed time:              0 11:09:15.27
Terminal name:                   Processor time:            0 00:00:04.70
Remote node addr:                Priority:          4
Remote node name:                Privilege <31-00>: 00118000
Remote ID:                       Privilege <63-32>: 00000000
Remote full name:
Posix UID:          -2           Posix GID:         -2 (%XFFFFFFFE)
Queue entry:                     Final status code: 00000001
Queue name:
Job name:
Final status text: %SYSTEM-S-NORMAL, normal successful completion
Page faults:             1433    Direct IO:                548
Page fault reads:         378    Buffered IO:             2727
Peak working set:       26048    Volumes mounted:            0
Peak page file:        214912    Images executed:            5
```

AUTOGEN Files

- There are two AUTOGEN files that can be helpful when analyzing OpenVMS Performance. They are:
  - SYS$SYSTEM:AGEN$FEEDBACK.DAT
    - Created by the SAVPARAMS phase
  - SYS$SYSTEM:AGEN$PARAMS.REPORT
    - Created by the GENPARAMS phase

AGEN$FEEDBACK.DAT

```
!
! This data file contains resource utilization information for use
by
! AUTOGENs feedback mechanism. This file should NOT be modified.
!
FEEDBACK_NODE = "PARSEC  "
FEEDBACK_SID = 2147483648
FEEDBACK_TIME = "29-JUL-2004 14:25:08.97"
FEEDBACK_UPTIME = 250061
PROCESSES_PEAK = 48
LOCKS_INUSE = 1355
LOCKS_PEAK = 3072
RESOURCES_INUSE = 1272
LOCKIDTBL_MAX_CUR = 1040185
LNMSHASHTBL_CUR = 512
LNMSHASHTBL_INUSE = 672
MAXPROCESSCNT_CUR = 529
GBLPAGES_CUR = 1759798
GBLSECTIONS_CUR = 650
LOCKIDTBL_CUR = 1792
RESHASHTBL_CUR = 2048
PAGEDYN_INUSE = 2160496
PAGEDYN_CUR = 5029888
PAGEDYN_ALLOCFAIL = 0
```

```
PAGEDYN_ALLOCFAILPAGES = 0
PAGEDYN_REQUESTS = 38366
NPAGEDYN_CUR = 4898816
NPAGEDYN_PEAK = 4898816
NPAGEDYN_ALLOCFAIL = 0
NPAGEDYN_ALLOCFAILPAGES = 0
NPAGEDYN_REQUESTS = 10646
MSCP_BUFFER_CUR = 1024
MSCP_TOTAL_IO = 0
MSCP_FRAG_IO = 0
MSCP_WAIT_IO = 0
GBLPAGES_PEAK = 184320
GBLSECTIONS_PEAK = 611
DINDXHITS = 167904
DINDXATTEMPTS = 168068
DIRHITS = 253281
DIRATTEMPTS = 253543
HDRHITS = 152543
HDRATTEMPTS = 156078
FIDHITS = 3540
FIDATTEMPTS = 3572
EXTHITS = 7647
EXTATTEMPTS = 7661
QUOHITS = 0
```

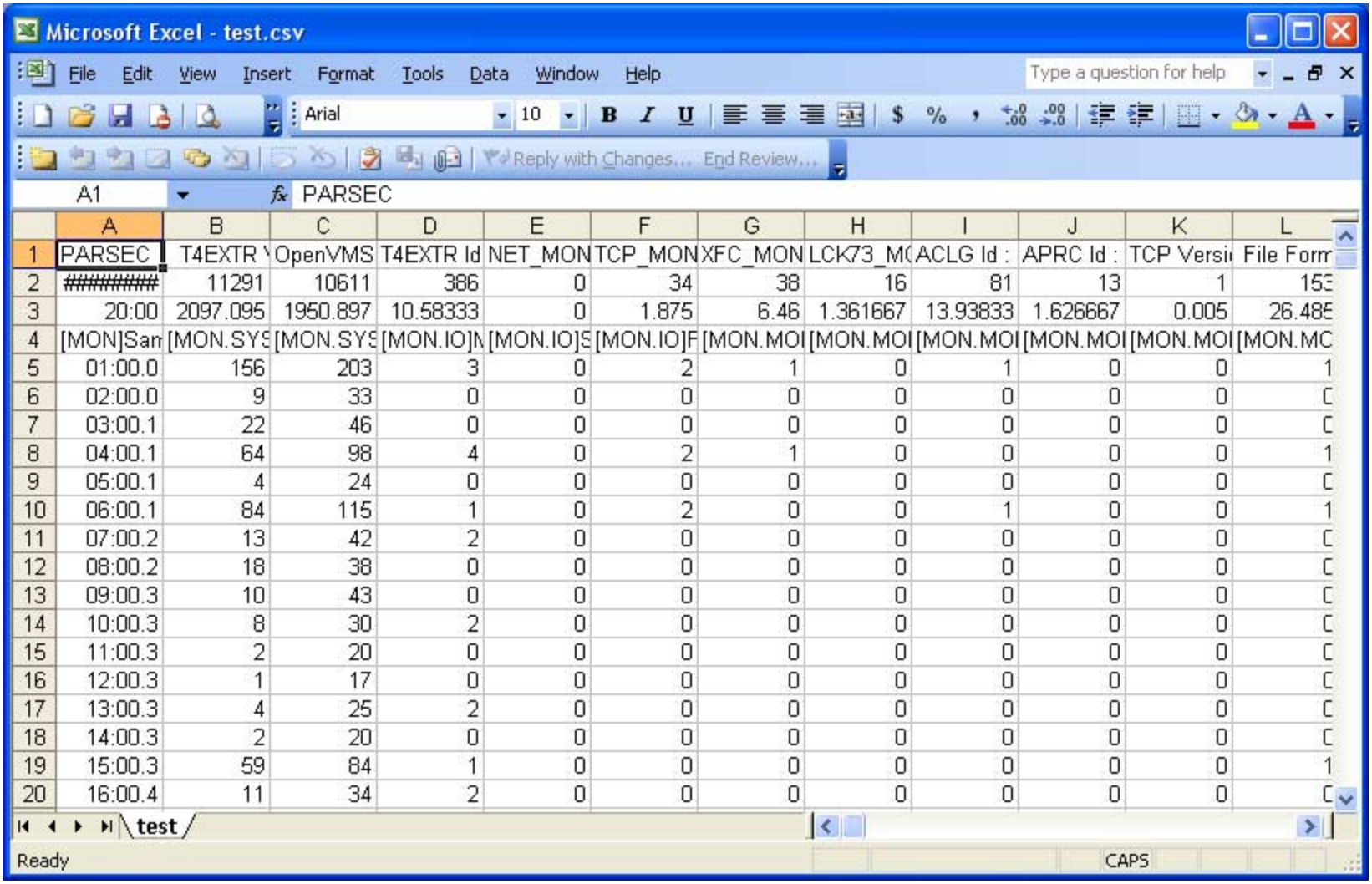
AGEN$PARAMS.REPORT

```
        o
        o
        o
Parameter information follows:
------------------------------

MAXPROCESSCNT parameter information:
        Feedback information.
           Old value was 529, New value is 423
           Maximum Observed Processes: 48
        o
        o
        o
NPAGEDYN parameter information:
        Feedback information.
           Old value was 4898816, New value is 4661248
           Maximum observed non-paged pool size: 4898816 bytes.
           Non-paged pool request rate: 0 requests per 10 sec.
        o
        o
        o
```

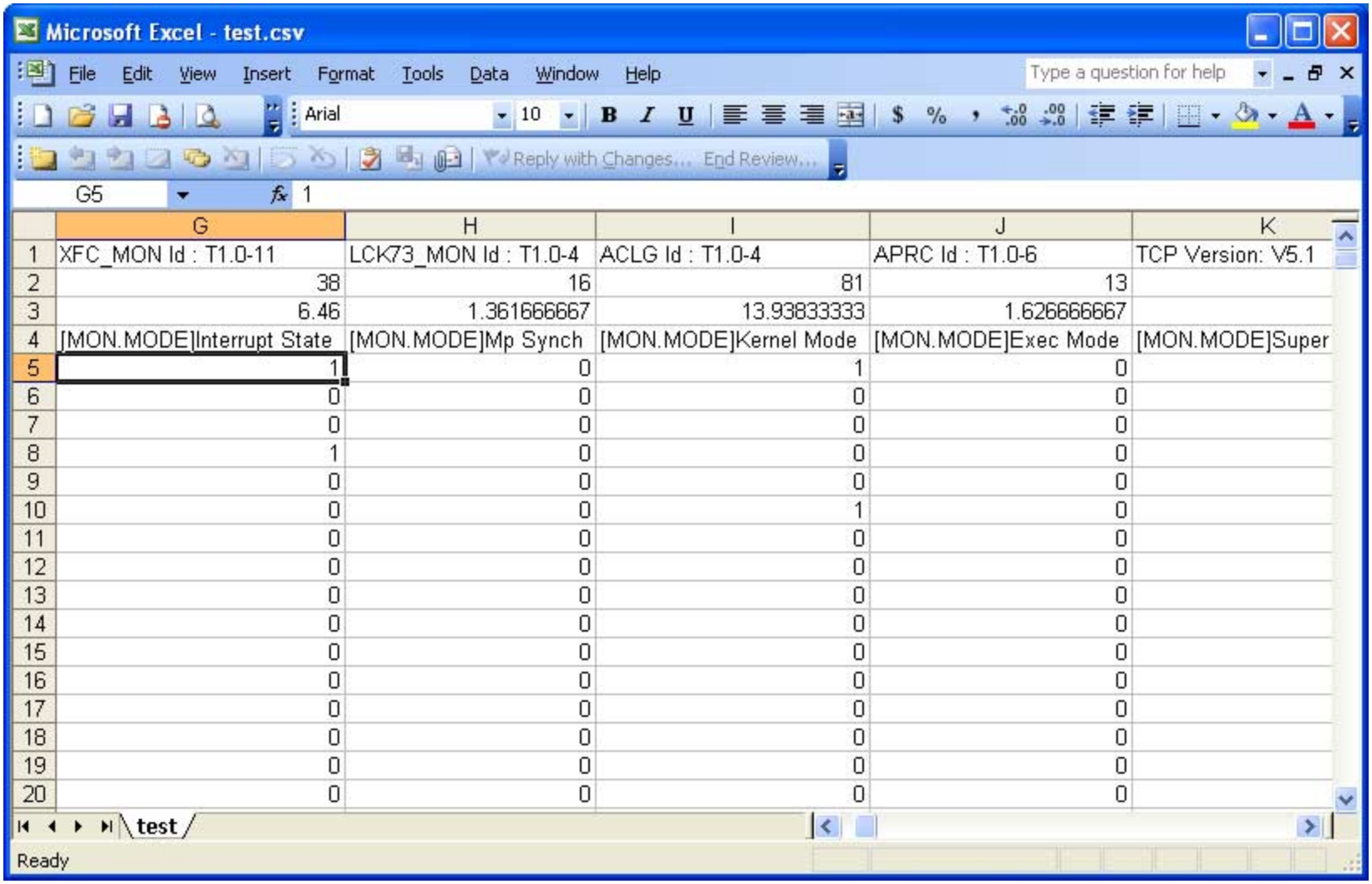
Generating T4 Graphs with Excel

- The following is a step by step example of generating an Excel graph using the CSV file created by T4
- The following example was generated using Microsoft Office 2003
- In this example we will be creating a graph for monitor modes
- As you will see, this can be quite time consuming



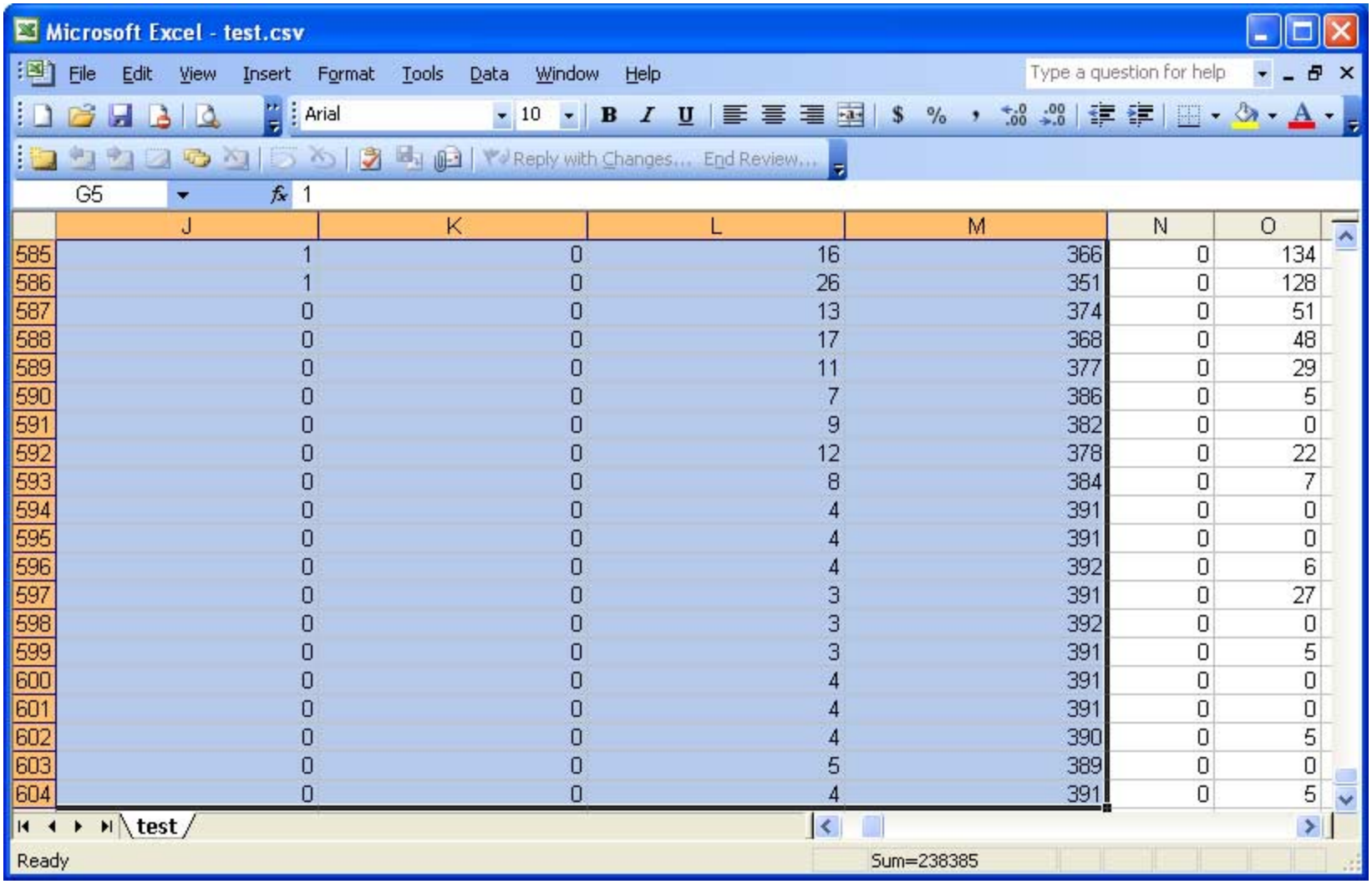
	A	B	C	D	E	F	G	H	I	J	K	L
1	PARSEC	T4EXTR	OpenVMS	T4EXTR Id	NET_MON	TCP_MON	XFC_MON	LCK73_M	ACLG Id :	APRC Id :	TCP Versi	File Form
2	#########	11291	10611	386	0	34	38	16	81	13	1	153
3	20:00	2097.095	1950.897	10.58333	0	1.875	6.46	1.361667	13.93833	1.626667	0.005	26.48
4	[MON]San	[MON.SYS	[MON.SYS	[MON.IO]M	[MON.IO]S	[MON.IO]F	[MON.MOI	[MON.MOI	[MON.MOI	[MON.MOI	[MON.MOI	[MON.MC
5	01:00.0	156	203	3	0	2	1	0	1	0	0	1
6	02:00.0	9	33	0	0	0	0	0	0	0	0	0
7	03:00.1	22	46	0	0	0	0	0	0	0	0	0
8	04:00.1	64	98	4	0	2	1	0	0	0	0	1
9	05:00.1	4	24	0	0	0	0	0	0	0	0	0
10	06:00.1	84	115	1	0	2	0	0	1	0	0	1
11	07:00.2	13	42	2	0	0	0	0	0	0	0	0
12	08:00.2	18	38	0	0	0	0	0	0	0	0	0
13	09:00.3	10	43	0	0	0	0	0	0	0	0	0
14	10:00.3	8	30	2	0	0	0	0	0	0	0	0
15	11:00.3	2	20	0	0	0	0	0	0	0	0	0
16	12:00.3	1	17	0	0	0	0	0	0	0	0	0
17	13:00.3	4	25	2	0	0	0	0	0	0	0	0
18	14:00.3	2	20	0	0	0	0	0	0	0	0	0
19	15:00.3	59	84	1	0	0	0	0	0	0	0	1
20	16:00.4	11	34	2	0	0	0	0	0	0	0	0

Open the CSV file



	G	H	I	J	K
1	XFC_MON Id : T1.0-11	LCK73_MON Id : T1.0-4	ACLG Id : T1.0-4	APRC Id : T1.0-6	TCP Version: V5.1
2	38	16	81	13	
3	6.46	1.361666667	13.93833333	1.626666667	
4	[MON.MODE]Interrupt State	[MON.MODE]Mp Synch	[MON.MODE]Kernel Mode	[MON.MODE]Exec Mode	[MON.MODE]Super
5	1	0	1	0	
6	0	0	0	0	
7	0	0	0	0	
8	1	0	0	0	
9	0	0	0	0	
10	0	0	1	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	

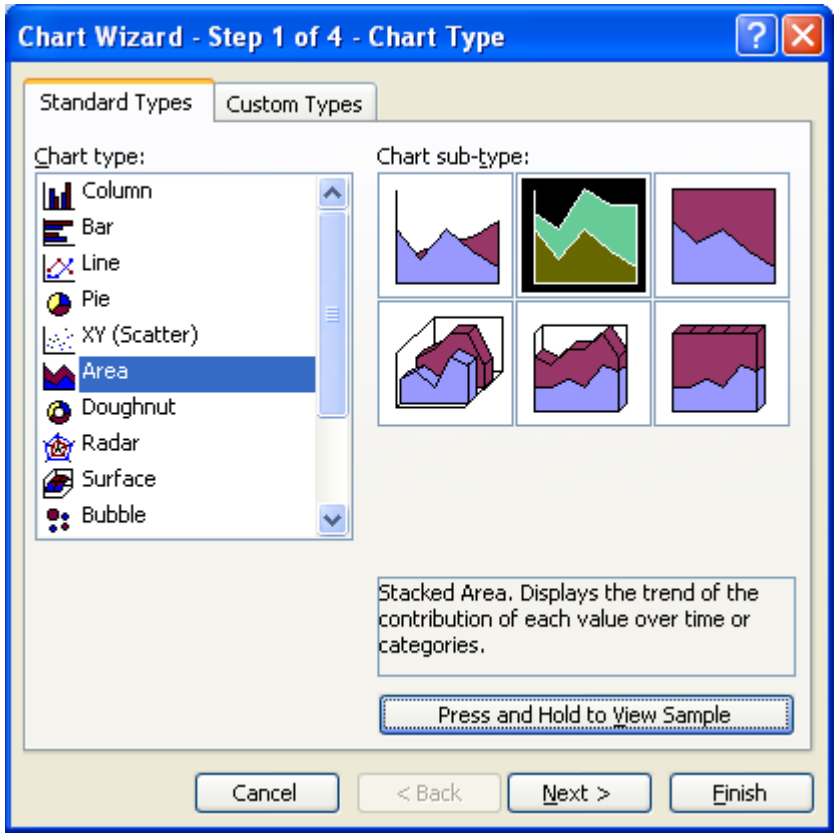
Expanded the columns by double clicking on the border between column headers



	J	K	L	M	N	O
585	1	0	16	366	0	134
586	1	0	26	351	0	128
587	0	0	13	374	0	51
588	0	0	17	368	0	48
589	0	0	11	377	0	29
590	0	0	7	386	0	5
591	0	0	9	382	0	0
592	0	0	12	378	0	22
593	0	0	8	384	0	7
594	0	0	4	391	0	0
595	0	0	4	391	0	0
596	0	0	4	392	0	6
597	0	0	3	391	0	27
598	0	0	3	392	0	0
599	0	0	3	391	0	5
600	0	0	4	391	0	0
601	0	0	4	391	0	0
602	0	0	4	390	0	5
603	0	0	5	389	0	0
604	0	0	4	391	0	5

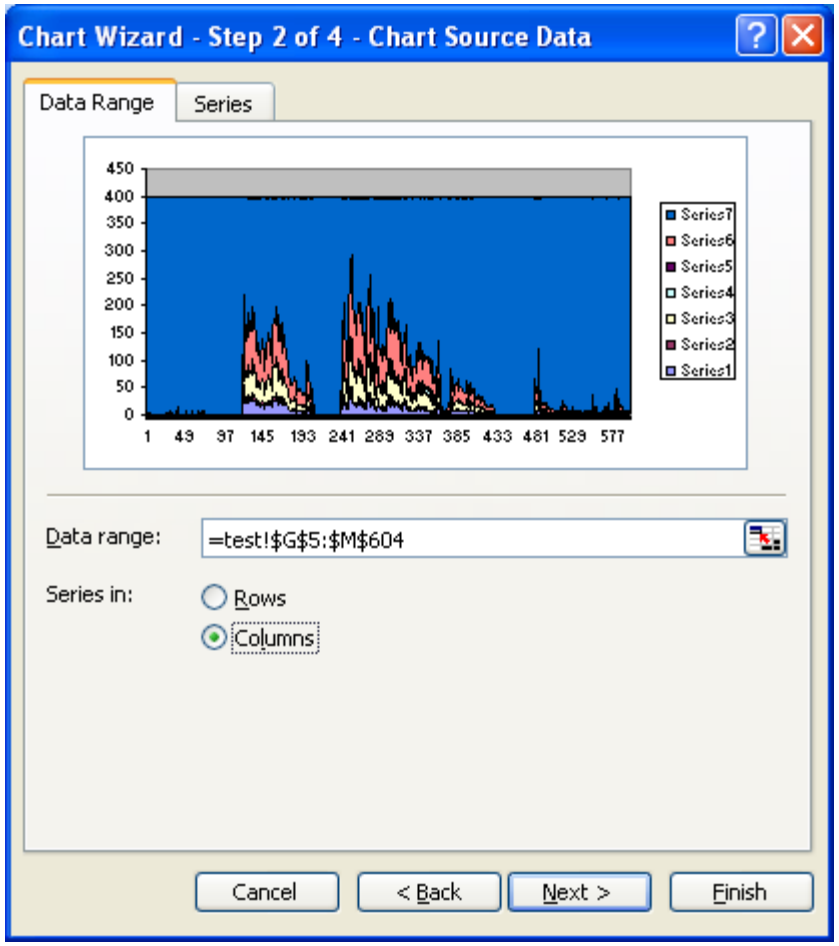
Select range of data to be plotted

- Click on first cell in range (F5)
- Hold shift and click on cell in first row of last column in range (M5)
- Hold shift and control, then press down arrow to select entire range(F5 – M604)

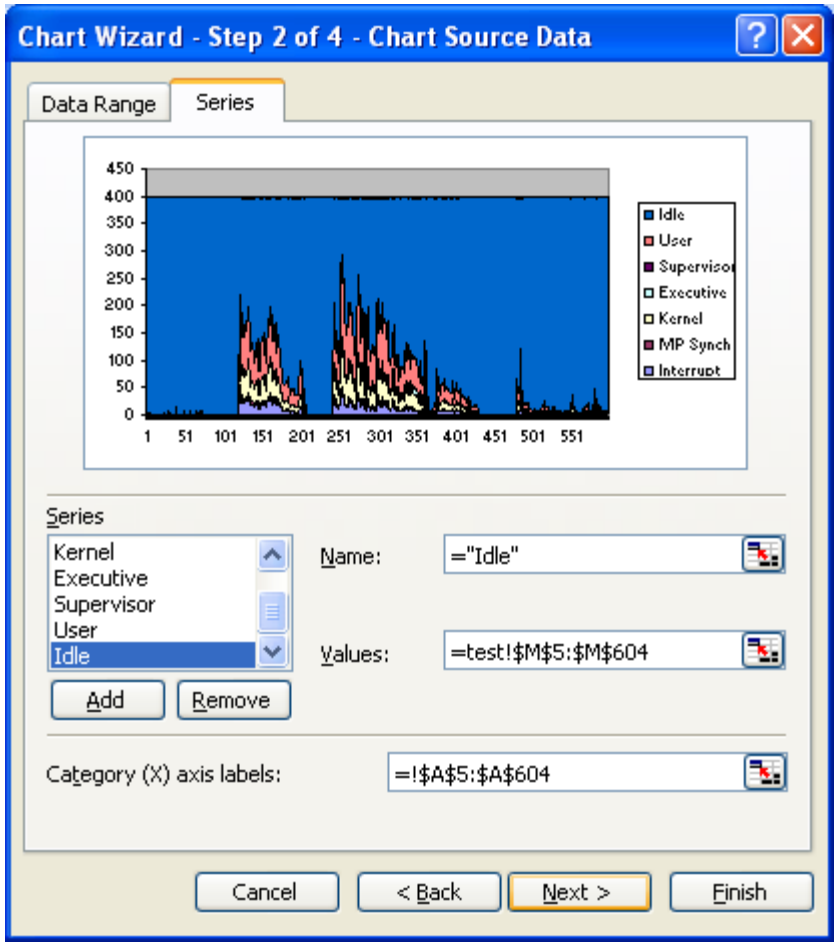


Select Chart from the Insert menu

- Select type of chart to be generated, common types are line and area
- Select chart sub-type, common types are line, stacked line, area and stacked area
- View same with “Press and Hold to View Sample” button
- Click Next

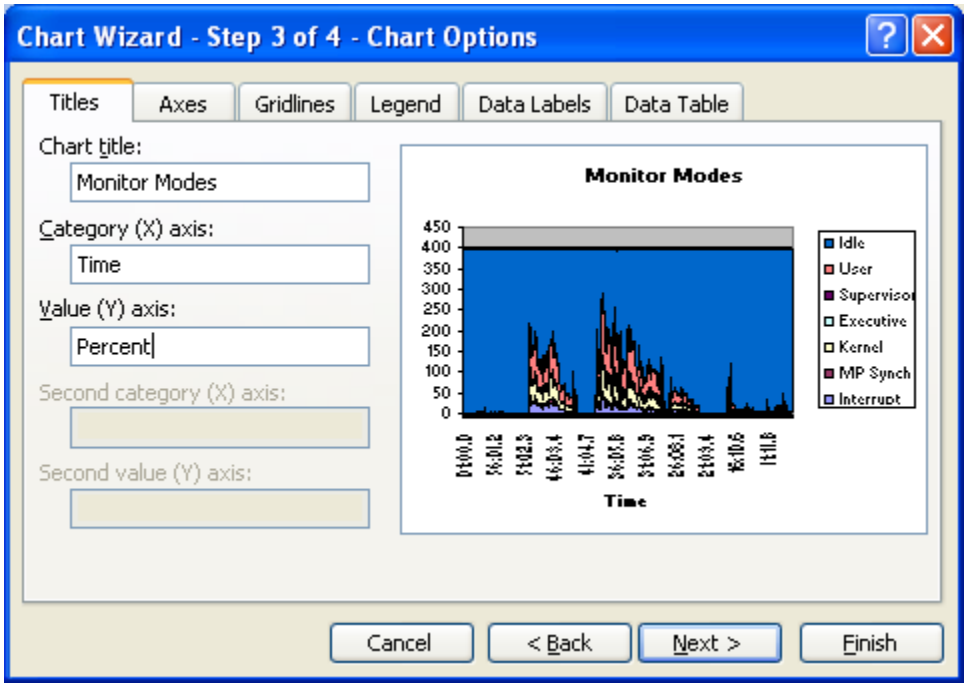


Click Series tab

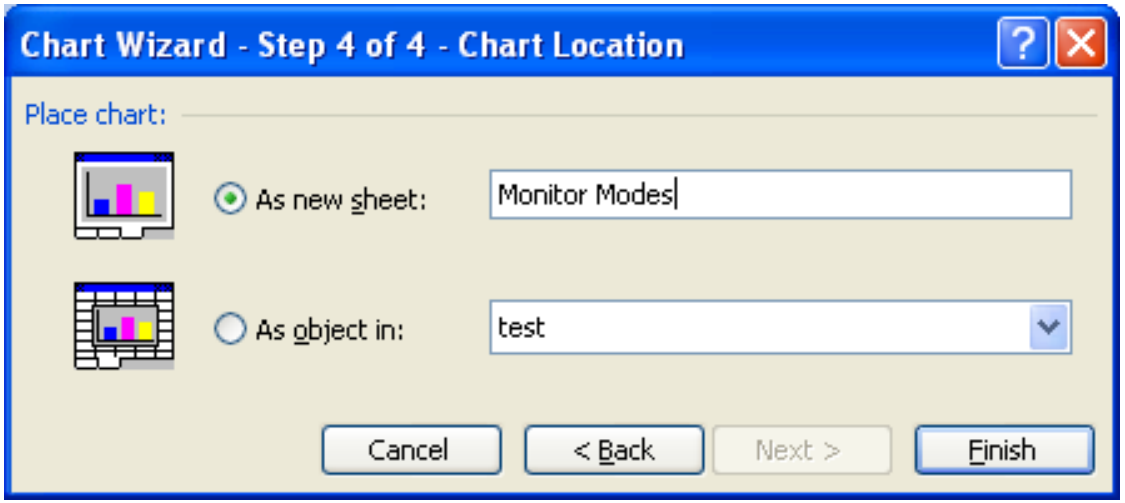


Set name of each data in series, this labels the data in the graph

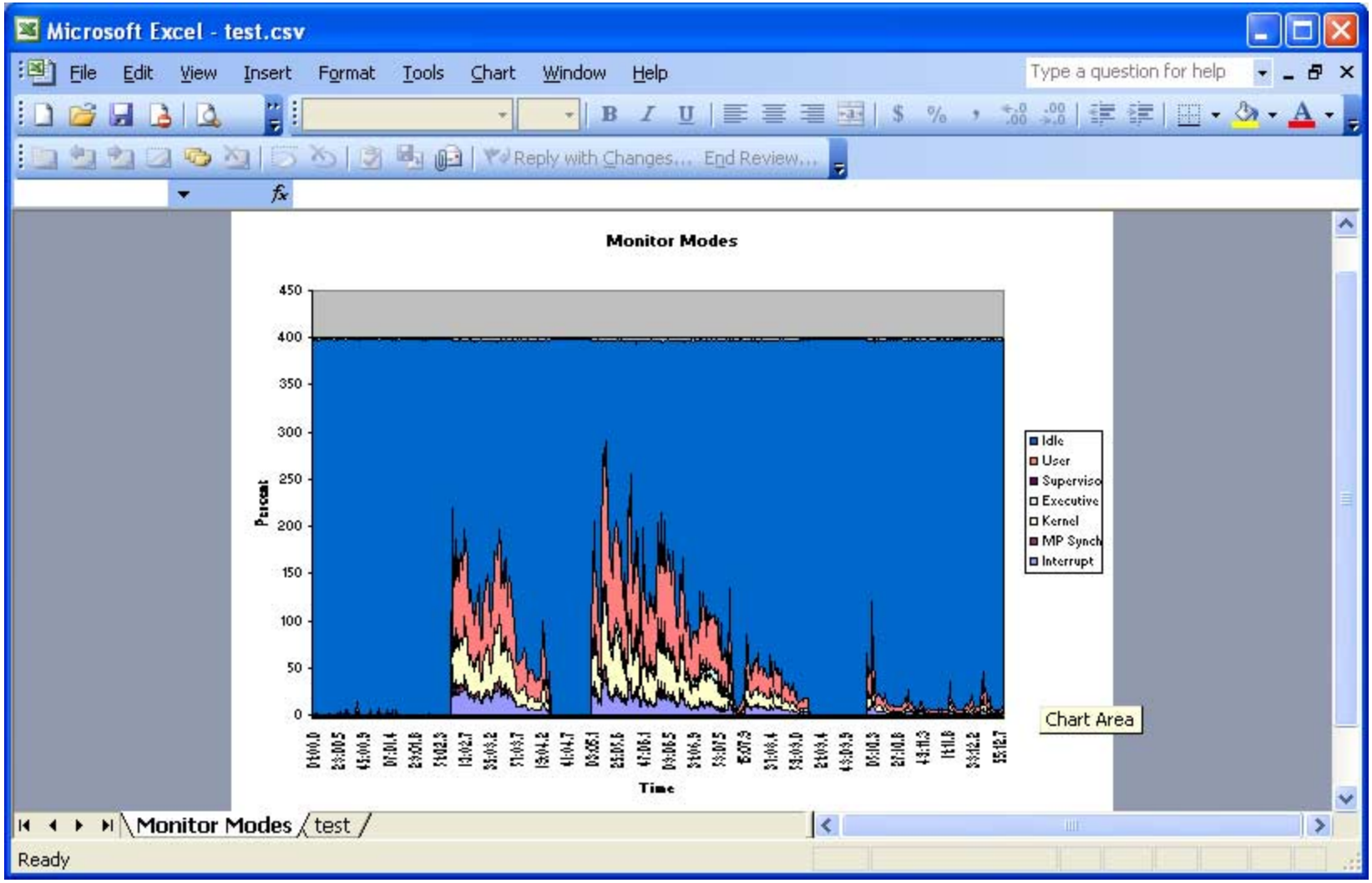
- Click on existing name (Series1 - Series5)
- Type in new name in Name field (Interrupt - Idle)
- Enter source of label for time for the “Category (X) Axis Labels. This is the same as the values for the data with the column changed to A
- Click Next



- Enter chart title, in this case Monitor Modes
- Enter Category (X) axis label, in this case Time
- Enter Value (Y) axis label, in this case Percent
- Click Next



- Click “As new sheet”
- Enter title for new sheet, in this case Monitor Modes
- This sets the name of the tab in Excel
- Click Finish


Microsoft Excel - test.csv
File Edit View Insert Format Tools Chart Window Help
Type a question for help
Reply with Changes... End Review...
Monitor Modes
450
400
350
300
250
200
150
100
50
0
Percent
Time
Idle
User
Supervisor
Executive
Kernel
MP Synch
Interrupt
Chart Area
Monitor Modes
test
Ready