

Performance Basics

for HP-UX

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Introduction

- What is Performance?
- Measurement Points
- Bottlenecks
 - Compute Cycles
 - I/O Transactions

Agenda

- Defining “Slow”
 - Interactive Response Time
 - Total Job Completion Time
- Measurement Tools

Vocabulary

- Common Performance Terms
 - Compute-bound
 - I/O Bound
 - Disk Thrashing
 - Swap Thrashing
 - Resource Limits

uptime(1)

- Quickest look at system:

```
uptime
```

```
5:36pm up 9 days,16:33, 46 users,  
load average: 1.85, 1.63, 1.47
```

- User count and load (runqueue)

sar(1)

- System Activity Reporter
 - b Buffer Cache Activity
 - c System Calls
 - d Block Device Activity
 - u CPU Utilization

```
(hpuerci)blh[534]$ sar -b 1 16
```

sar -b

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

Time	bread/s	lread/s	%rcache	bwrit/s	lwrit/s	%wcache	pread/s	pwrit/s
22:14:58	0	174	100	0	0	0	0	0
22:14:59	18	0	0	5	9	44	0	0
22:15:00	29	145	80	3	8	62	0	0
22:15:01	0	358	100	2	3	33	0	0
22:15:02	0	297	100	2	11	82	0	0
22:15:03	0	258	100	1	8	88	0	0
22:15:04	0	181	100	0	0	0	0	0
22:15:05	2	12	83	2	2	0	0	0
22:15:06	0	6	100	0	0	0	0	0
22:15:07	0	0	0	0	0	0	0	0
22:15:08	0	5	100	0	0	0	0	0
22:15:09	0	0	0	0	0	0	0	0
22:15:10	0	0	0	0	0	0	0	0
22:15:11	0	0	0	0	0	0	0	0
22:15:12	0	0	0	1	1	0	0	0
22:15:13	0	0	0	0	0	0	0	0
22:15:14	0	8	100	0	0	0	0	0
Average	3	90	97	1	3	62	0	0

```
(hpuerci)blh[535]$
```

```
(hpuerci)blh[535]$ sar -c 1 16
```

sar -c

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

Time	scall/s	sread/s	swrit/s	fork/s	exec/s	rchar/s	wchar/s
22:30:52							
22:30:53	740	105	52	0.00	0.00	674816	45056
22:30:54	600	86	42	0.00	0.00	493568	82944
22:30:55	603	97	45	0.00	0.00	579584	63488
22:30:56	723	80	48	0.00	0.00	430080	48128
22:30:57	355	56	37	0.00	0.00	509952	66560
22:30:58	452	59	37	0.00	0.00	615424	176128
22:30:59	412	58	42	0.00	0.00	424960	51200
22:31:00	1161	116	72	6.00	6.00	1557504	108544
22:31:01	454	63	44	0.00	0.00	531456	108544
22:31:02	432	54	37	0.00	0.00	382976	43008
22:31:03	357	55	38	0.00	0.00	621568	114688
22:31:04	402	54	25	0.00	0.00	203776	243712
22:31:05	362	55	36	0.00	0.00	399360	57344
22:31:06	480	67	42	0.00	0.00	458752	60416
22:31:07	378	62	26	0.00	0.00	28672	3072
22:31:08	553	74	33	0.00	0.00	390144	55296
Average	529	71	41	0.38	0.38	518312	83008

```
(hpuerci)blh[536]$
```

Global


CPU

Memory

Disk

Next
KeysSelect
Process

Help

Exit
Glance25.20  dcd

HP2392A -- COM1(19200)

? Enter Insert Num Caps Stop


```
(hpuerci)blh[476]$ sar -d 1 5
```

sar -d

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

Time	device	%busy	avque	r+w/s	blks/s	avwait	avserv
20:32:25	disc3-0	8	4.4	8	144	33.8	10.0
	disc3-2	34	1.0	17	256	0.0	20.0
	disc3-1	2	1.0	2	16	0.0	10.0
20:32:27	disc3-2	50	1.0	33	380	0.0	15.2
20:32:28	disc3-0	2	1.5	1	64	10.0	20.0
	disc3-2	14	1.0	7	92	0.0	20.0
20:32:29	disc3-0	1	1.0	1	8	0.0	10.0
	disc3-2	57	1.0	34	348	0.0	16.8
20:32:30	disc3-2	42	1.0	26	300	0.0	16.2
Average	disc3-0	2	3.5	2	43	28.0	11.0
	disc3-2	39	1.0	23	275	0.0	16.8
	disc3-1	0	1.0	0	3	0.0	10.0

```
(hpuerci)blh[477]$
```

```
Reflection 1 - SETTINGS.R1W
File Edit Terminal Connection Options Window Help

(hpuerci)blh[500]$ du /users>/dev/null&
[1]      3182
(hpuerci)blh[501]$ sar -u 1 14

HP-UX hpuerci A.09.04 U 9000/897      06/12/95

21:11:35      %usr      %sys      %wio      %idle
21:11:36          2          22          76          0
21:11:37          2          16          82          0
21:11:38          1          20          79          0
21:11:39          8          18          74          0
21:11:40          2          21          77          0
21:11:41          2          15          83          0
21:11:42          3          23          74          0
21:11:43          5          20          75          0
21:11:44          5          27          68          0
21:11:45          4          18          78          0
21:11:46          6          18          76          0
21:11:47          3          26          71          0
21:11:48         13          26          61          0
21:11:49          8          19          73          0

Average          5          21          75          0
(hpuerci)blh[502]$
```

sar -u

29.20



HP2392A -- COM1(19200)



Enter

Insert

Num

Caps

Stop

sar(1) (cont.)

- System Activity Reporter
 - -a File Access
 - -m Message/Semaphore Activity
 - -v Kernel Parameters

```
(hpuerci)blh[536]$ sar -a 1 16
```

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

22:34:36	iget/s	namei/s	dirbk/s
22:34:37	2	2	0
22:34:38	1	1	0
22:34:39	1	1	0
22:34:40	1	1	0
22:34:41	1	1	0
22:34:42	1	1	0
22:34:43	1	2	0
22:34:44	3	4	0

```
(hpuerci)blh[538]$ du /users>/dev/null&
```

```
[1] 4381
```

```
(hpuerci)blh[539]$ sar -a 1 8
```

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

22:35:01	iget/s	namei/s	dirbk/s
22:35:02	814	494	34
22:35:03	869	501	47
22:35:04	869	502	44
22:35:05	1693	910	39

sar -a

```
(hpuerci) b1h[563]$ sar -m 1 16
```

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

	msg/s	sema/s
22:59:19		
22:59:20	40.00	0.00
22:59:21	0.00	0.00
22:59:22	40.00	0.00
22:59:23	0.00	0.00
22:59:24	40.00	0.00
22:59:25	0.00	0.00

```
Average 20.00 0.00
```

```
(hpuerci) b1h[564]$ sar -m 2 16
```

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

	msg/s	sema/s
22:59:39		
22:59:41	20.00	0.00
22:59:43	20.00	0.00
22:59:45	20.00	0.00
22:59:47	20.00	0.00
22:59:49	20.00	0.00
22:59:51	20.00	0.00

sar -m

sar -v

```
(hpuerci)blh[567]$ sar -v 1 12
```

```
HP-UX hpuerci A.09.04 U 9000/897 06/12/95
```

23:05:45	text-sz	ov	proc-sz	ov	inod-sz	ov	file-sz	ov
23:05:46	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:47	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:48	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:49	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:50	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:51	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:52	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:53	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:54	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:55	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:56	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0
23:05:57	N/A	N/A	623/1500	0	2997/3000	0	2797/7010	0

```
(hpuerci)blh[568]$
```

iostat(1)

■ Report I/O Statistics

- Number of seeks per second
- Kbytes transferred per second
- Milliseconds per average seek

```
hpuerci /root # iostat 1 2
```

device	bps	sps	msps
c0t6d0	0	0.0	1.0
c0t5d0	0	0.0	1.0
c1t0d0	0	0.0	1.0
c1t1d0	0	0.0	1.0
c1t2d0	0	0.0	1.0
c1t3d0	0	0.0	1.0
c1t4d0	0	0.0	1.0
c1t5d0	0	0.0	1.0
c1t6d0	0	0.0	1.0
c0t6d0	70	9.0	1.0
c1t0d0	0	0.0	1.0
c1t1d0	0	0.0	1.0
c1t3d0	0	0.0	1.0
c1t4d0	2	0.0	1.0
c1t5d0	0	0.0	1.0
c1t6d0	0	0.0	1.0

```
hpuerci /root #
```

iostat 1 2


```
hpuerci /root # iostat 1 2
```

device	bps	sps	mtps
c0t6d0	0	0.0	1.0
c0t5d0	0	0.0	1.0
c1t0d0	0	0.0	1.0
c1t1d0	0	0.0	1.0
c1t2d0	0	0.0	1.0
c1t3d0	0	0.0	1.0
c1t4d0	0	0.0	1.0
c1t5d0	0	0.0	1.0
c1t6d0	0	0.0	1.0
c0t5d0	1251	2.5	1.0
c1t0d0	0	0.0	1.0
c1t1d0	1	0.0	1.0
c1t4d0	1128	55.6	1.0
c1t5d0	0	0.0	1.0
c1t6d0	0	0.0	1.0

```
hpuerci /root # _
```

iostat 1 2

(with dd)

vmstat(1)

- Virtual Memory Statistics
 - -d Disk Transfers per second
 - -S Processes swapped
 - -f Forks and VM Pages

vmstat(1) (cont.)

■ Process Statistics

- r in run queue
- b blocked for resources
- w runnable/ShortSleep but swapped

■ Memory Statistics

- avm active virtual pages
- free size of free list

vmstat(1) (cont.)

■ Page Statistics:

- re page reclaims
- at address translation faults
- pi pages paged in
- po pages paged out

■ Faults

- in device interrupts/sec
- sy system calls per second
- cs CPU context switch

vmstat(1) (cont.)

■ CPU Statistics

- us user time normal/lowPri
- sy system time
- id CPU idle

hpuerci /root # vmstat 1 9

procs				memory				page					
faults		cpu		avm	free	re	at	pi	po	fr	de	sr	in
r	b	u	sy	id									
0	1	0	9572	22647	15	16	0	0	0	0	0	0	145
416	75	4	3	94									
0	1	0	9572	22617	3	0	0	0	0	0	0	0	123
175	48	0	0	100									
0	1	0	4608	22617	2	0	0	0	0	0	0	0	122
164	47	0	2	98									
0	1	0	4608	22617	1	0	0	0	0	0	0	0	121
152	46	0	0	100									
0	1	0	4608	22617	0	0	0	0	0	0	0	0	119
141	45	0	0	100									
0	1	0	4608	22617	0	0	0	0	0	0	0	0	118
134	44	0	0	100									
0	1	0	4608	22617	0	0	0	0	0	0	0	0	116
126	43	0	0	100									
0	1	0	4216	22617	0	0	0	0	0	0	0	0	115
133	42	0	0	100									
0	1	0	4216	22617	0	0	0	0	0	0	0	0	114
123	41	0	1	99									

hpuerci /root #

hpuerci /root # vmstat 1 20

procs			memory				page				faults			cpu			
r	b	w	avm	free	re	at	pi	po	fr	de	sr	in	sy	cs	us	sy	id
0	1	0	5044	22679	15	16	0	0	0	0	0	145	416	75	4	3	94
0	1	0	5044	22649	3	0	0	0	0	0	0	228	845	312	1	0	99
0	1	0	5044	22649	2	0	0	0	0	0	0	210	712	274	1	0	99
0	1	0	5044	22649	1	0	0	0	0	0	0	194	596	229	3	1	96
0	1	0	4671	22649	0	0	0	0	0	0	0	183	510	195	0	1	99
0	1	0	4671	22649	0	0	0	0	0	0	0	172	448	167	0	1	99
0	1	0	4671	22649	0	0	0	0	0	0	0	170	406	150	1	1	98
0	1	0	4671	22649	0	0	0	0	0	0	0	165	361	132	0	2	98
1	1	0	4310	22649	0	0	0	0	0	0	0	146	270	99	1	0	99
1	1	0	4310	22649	0	0	0	0	0	0	0	149	265	96	-1	0	101
1	1	0	4310	22649	0	0	0	0	0	0	0	144	241	87	0	0	100
1	1	0	4310	22649	0	0	0	0	0	0	0	166	305	108	-1	1	100
1	1	0	4310	22649	0	0	0	0	0	0	0	161	282	100	-1	-1	102
0	1	0	4327	22649	0	0	0	0	0	0	0	177	333	117	0	1	99
0	1	0	4327	22649	0	0	0	0	0	0	0	171	310	108	-1	1	100
0	1	0	4327	22649	0	0	0	0	0	0	0	166	289	100	-1	1	100
0	1	0	4327	22649	0	0	0	0	0	0	0	158	257	90	-1	1	100
0	1	0	4327	22649	0	0	0	0	0	0	0	157	248	88	-1	3	99
0	1	0	4327	22649	0	0	0	0	0	0	0	152	230	81	-1	0	101
0	1	0	4327	22649	0	0	0	0	0	0	0	151	223	80	0	1	99

hpuerci /root #

vmstat(1) (cont.)

- 1 liners:
 - vmstat -f (fork activity)
 - vmstat -s (summary)
- Zero counters
 - vmstat -z


```
hp CI
File Edit Connection Setup Macro Window Help

hpuerci /root # vmstat -s
56782 swap ins
56782 swap outs
2 pages swapped in
2 pages swapped out
891221770 total address trans. faults taken
299623011 page ins
2330 page outs
324262 pages paged in
5017 pages paged out
289864387 reclaims from free list
299394018 total page reclaims
70 intransit blocking page faults
461700071 zero fill pages created
199540138 zero fill page faults
274479917 executable fill pages created
108644 executable fill page faults
0 swap text pages found in free list
157091936 inode text pages found in free list
72 revolutions of the clock hand
146478 pages scanned for page out
3356 pages freed by the clock daemon
716996778 cpu context switches
3263689941 device interrupts
82748914 traps
3937339458 system calls
hpuerci /root #
```

54, 17

HP70092 -- hpuerci.atl.hp.com via TELNET

Num

top(1)

- Top Processes on the System
- System data - Summary
 - name and time
 - Load Average 1,5,15 minutes
 - % time in user,nice,system,idle,etc
- Memory
 - Virtual and Real
- Individual Processes

System: hpuerca Mon Jun 12 23:47:05 1995

Load averages: 0.00, 0.02, 0.05

324 processes: 320 sleeping, 1 waiting, 3 starting

Cpu states:

CPU	LOAD	USER	NICE	SYS	IDLE	UNK5	UNK6	INTR	SSYS
0	0.00	0.0%	0.0%	0.8%	99.2%	0.0%	0.0%	0.0%	0.0%
1	0.00	0.4%	0.0%	1.4%	98.2%	0.0%	0.0%	0.0%	0.0%
---	---	---	---	---	---	---	---	---	---
avg	0.00	0.2%	0.0%	1.0%	98.8%	0.0%	0.0%	0.0%	0.0%

Memory: 97564K (43988K) real, 89828K (48012K) virtual, 168952K free Screen # 1/21

CPU	TTY	PID	USERNAME	PRI	NI	SIZE	RES	STATE	TIME	%WCPU	%CPU	COMMAND
0	p7	21345	blh	179	20	284K	324K	wait	0:00	2.26	1.47	top
0	p7	21327	blh	158	20	224K	80K	sleep	0:00	0.68	0.48	-ksh
1	?	21263	mjb	156	20	388K	260K	sleep	0:01	0.25	0.25	vi /tmp/
0	p7	21326	root	154	20	52K	144K	sleep	0:00	0.33	0.23	rlogind
1	?	3	root	128	20	0K	0K	sleep	34:12	0.22	0.22	statdaem
1	?	231	root	154	20	7644K	7692K	sleep	87:00	0.18	0.18	/etc/nam
0	?	0	root	128	20	0K	0K	sleep	15:47	0.09	0.09	swapper
1	?	15996	lp	154	20	76K	188K	sleep	0:16	0.09	0.09	/usr/lib
1	?	220	root	154	20	88K	184K	sleep	7:03	0.08	0.08	/etc/ine
1	?	86	root	154	20	20K	72K	sleep	8:33	0.07	0.07	syncer

```
HP CI
File Edit Connection Setup Macro Window Help
System: vbox
Load averages: 1.13, 1.14, 1.14
155 processes: 136 sleeping, 19 running
Cpu states:
CPU  LOAD  USER  NICE  SYS  IDLE  BLOCK  SWAIT  INTR  SSYS
0    3.00  0.0%  99.4%  0.6%  0.0%  0.0%  0.0%  0.0%  0.0%
1    1.00  0.0%  98.0%  2.0%  0.0%  0.0%  0.0%  0.0%  0.0%
2    1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
3    1.00  0.2%  98.6%  1.2%  0.0%  0.0%  0.0%  0.0%  0.0%
4    1.00  0.2%  99.2%  0.6%  0.0%  0.0%  0.0%  0.0%  0.0%
5    1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
6    1.01  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
7    1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
8    1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
9    1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
10   1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
11   1.00  0.0%  99.6%  0.0%  0.4%  0.0%  0.0%  0.0%  0.0%
12   1.00  0.0% 100.0%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
13   1.00  0.0%  99.0%  0.8%  0.2%  0.0%  0.0%  0.0%  0.0%
14   1.00  0.0%  98.4%  1.6%  0.0%  0.0%  0.0%  0.0%  0.0%
----
avg  1.13  0.0%  99.4%  0.4%  0.2%  0.0%  0.0%  0.0%  0.0%

Memory: 270956K (251936K) real, 286788K (275892K) virtual, 15099772K free Page

24, 80 HP70092 -- hpuerci.atl.hp.com via TELNET Num
```

HP Performance Tools

- HP GlancePlus
 - for real-time system performance monitoring
- HP Performance Collection Software
 - for collecting and managing historical system performance data.
 - MeasureWare uses the unique kernel daemon midaemon to minimize intrusion and maximize accuracy.

Glance

Command	Screen Displayed / Description
a	All CPU Detail Screen
c	CPU Detail Screen
d	Disk Detail Screen
g	Global Screen
i	Disk I/O by File System Screen
k	Diskless Server Resource Utilization Screen
l	Lan Detail Screen
m	Memory Detail Screen
n	NFS Detail Screen
t	System Table Utilization Screen
u	Disk Queue Lengths Screen
v	Logical Volume Detail Screen
w	Swap Detail Screen
?	Commands Menu

B3692A GlancePlus B.09.00 23:49:39 hpuerca 9000/870 Current Avg High

Cpu Util	S	SNU		28%	28%	28%
Disk Util	F	F		13%	13%	13%
Mem Util	SSU	U3 B		49%	49%	49%
Swap Util	R	R		13%	13%	13%

GLOBAL SUMMARY

Users=64

Process Name	PID	PPID	Pri	User Name	CPU Util (200% max)	Cum CPU	Disk IO Rate	RSS	YSS	Block On
glance	21358	21327	168	blh	43.4/45.8	1940ms	17.2/16.1	2012	2888	SLEEP

Page 1 of 1

Global CPU Memory Disk

Next Keys Select Process Help Exit Glance

B3692A GlancePlus C.03.35.00 10:10:26 hpuerci 9000/800 Current Avg High

CPU Util	S	SNN		I	33%	25%	33%
Disk Util	F			I	70%	78%	87%
Mem Util	S	SU	UB	I	88%	88%	88%
Swap Util	U	UR R		I	34%	34%	34%

PROCESS LIST

Users= 13

Process Name	PID	PPID	Pri	User Name	CPU Util (100% max)	Cum CPU	Disk IO Rate	RSS	Block On
du	1207	25100	148	root	29.7/20.6	2.0	108/ 112	196kb	IO

Process List
CPU Report
Memory Report
Disk Report

Next Keys
Select Process
Help
Exit Glance

B3692A GlancePlus C.03.35.00 10:11:39 hpuerci 9000/800 Current Avg High

Cpu Util	SSN	N	100%	100%	100%
Disk Util	F F	I	13%	7%	13%
Mem Util	S SU UB	I	88%	88%	88%
Swap Util	U UR R	I	34%	34%	34%

PROCESS LIST

Users= 13

Process Name	PID	PPID	Pri	User Name	CPU Util (100% max)	Cum CPU	Disk IO Rate	RSS	Block On
sh	1320	25100	237	root	97.1/95.0	5.7	0.0/ 0.0	196kb	PRI

[Process List](#)
[CPU Report](#)
[Memory Report](#)
[Disk Report](#)

[Next Keys](#)
[Select Process](#)
[Help](#)
[Exit Glance](#)

B3692A GlancePlus C.03.35.00 10:30:43 e35 9000/816 Current Avg High

CPU Util	S	SARU	U	I	31%	13%	74%
Disk Util	F	FV	U	I	28%	7%	63%
Mem Util	S	SU	UB	I	98%	96%	100%
Swap Util	U	UR	R	I	56%	56%	57%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	873	52674	174.6	52.6	440.3
Page In	187	15666	37.4	15.6	122.2
Page Out	78	439	15.6	0.4	22.2
KB Paged In	768kb	32.4mb	153.6	33.0	357.7
KB Paged Out	472kb	2.2mb	94.4	2.2	98.1
Reactivations	5	977	1.0	0.9	3.9
Deactivations	7	989	1.4	0.9	2.7
KB Deactivated	12kb	12kb	2.4	0.0	2.4
VM Reads	57	6467	11.4	6.4	29.6
VM Writes	52	394	10.4	0.3	19.8

Total VM : 27.6mb Sys Mem : 11.1mb User Mem: 46.9mb Phys Mem: 64.0mb
 Active VM: 12.0mb Buf Cache: 4.8mb Free Mem: 1.3mb

Page 1 of 1

Process List	CPU Report	Memory Report	Disk Report	Next Keys	Select Process	Help	Exit Glance
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B3692A GlancePlus C.03.50.00 11:35:23 shady 9000/879 Current Avg High

CPU Util	S			1%	1%	4%
Disk Util	F			1%	2%	6%
Mem Util	S	SUUB B		19%	19%	19%
Swap Util	UURR			6%	6%	6%

MEMORY REPORT

Users= 4

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	1	1043	0.1	13.5	135.3
Page In	1	556	0.1	7.2	74.2
Page Out	0	0	0.0	0.0	0.0
KB Paged In	0kb	256kb	0.0	3.3	148.5
KB Paged Out	0kb	0kb	0.0	0.0	0.0
Reactivations	0	0	0.0	0.0	0.0
Deactivations	0	0	0.0	0.0	0.0
KB Deactivated	0kb	0kb	0.0	0.0	0.0
VM Reads	0	19	0.0	0.2	7.1
VM Writes	0	4	0.0	0.0	0.7

Total VM : 105.1mb Sys Mem : 80.7mb User Mem: 26.9mb Phys Mem: 768.0mb
 Active VM: 44.2mb Buf Cache: 38.4mb Free Mem: 622.0mb

Page 1 of 1

Process List	CPU Report	Memory Report	Disk Report	Next Keys	Select Process	Help	Exit Glance
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B3692A GlancePlus C.03.50.00 11:58:10 shady 9000/879 Current Avg High

CPU Util	SS				I 3%	8%	25%
Disk Util	F				I 98%	55%	98%
Mem Util	S	SU	UB	B	I 40%	32%	40%
Swap Util	U	URR			I 12%	8%	12%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	0	588	0.0	4.1	60.7
Page In	0	96	0.0	0.6	15.7
Page Out	0	0	0.0	0.0	0.0
KB Paged In	0kb	604kb	0.0	4.2	231.4
KB Paged Out	0kb	0kb	0.0	0.0	0.0
Reactivations	0	0	0.0	0.0	0.0
Deactivations	0	0	0.0	0.0	0.0
KB Deactivated	0kb	0kb	0.0	0.0	0.0
VM Reads	0	45	0.0	0.3	15.0
VM Writes	0	0	0.0	0.0	0.0

Total VM : 104.0mb Sys Mem : 159.0mb User Mem: 56.5mb Phys Mem: 768.0mb
 Active VM: 57.7mb Buf Cache: 94.7mb Free Mem: 457.8mb

Page 1 of 1

Process List
CPU Report
Memory Report
Disk Report
Next Keys
Select Process
Help
Exit Glance

B3692A GlancePlus C.03.50.00 11:59:00 shady 9000/879 Current Avg High

CPU Util	S	SU	23%	7%	25%
Disk Util	F	F	9%	53%	98%
Mem Util	S	SU	100%	38%	100%
Swap Util	U	UR	21%	11%	21%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	18190	31620	3498.0	163.6	3498.0
Page In	0	111	0.0	0.5	15.7
Page Out	2	2	0.3	0.0	0.3
KB Paged In	0kb	616kb	0.0	3.1	231.4
KB Paged Out	8kb	8kb	1.5	0.0	1.5
Reactivations	0	0	0.0	0.0	0.0
Deactivations	0	0	0.0	0.0	0.0
KB Deactivated	0kb	0kb	0.0	0.0	0.0
VM Reads	0	47	0.0	0.2	15.0
VM Writes	2	2	0.3	0.0	0.3

Total VM : 303.8mb Sys Mem : 160.0mb User Mem: 513.3mb Phys Mem: 768.0mb
 Active VM: 248.6mb Buf Cache: 94.7mb Free Mem: 0kb

Page 1 of 1

Process List
CPU Report
Memory Report
Disk Report
Next Keys
Select Process
Help
Exit Glance

B3692A GlancePlus C.03.50.00 11:59:52 shady 9000/879 Current Avg High

CPU Util	S	SU				26%	10%	44%
Disk Util	FV				U	74%	55%	98%
Mem Util	S	SU			UBB	100%	41%	100%
Swap Util	U	UR			R	39%	17%	39%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	27099	122876	4516.5	499.9	4516.5
Page In	28	7455	4.6	30.3	623.8
Page Out	1351	9360	225.1	38.0	238.1
KB Paged In	120kb	12.6mb	20.0	52.6	506.9
KB Paged Out	18.4mb	125.3mb	3136.0	521.8	3667.7
Reactivations	3	11	0.5	0.0	0.9
Deactivations	0	15	0.0	0.0	0.5
KB Deactivated	96kb	96kb	16.0	0.3	16.0
VM Reads	16	1143	2.6	4.6	39.8
VM Writes	988	9094	164.6	36.9	256.1

Total VM : 710.8mb Sys Mem : 161.1mb User Mem: 566.1mb Phys Mem: 768.0mb
 Active VM: 671.3mb Buf Cache: 38.4mb Free Mem: 2.4mb

Page 1 of 1

Process List	CPU Report	Memory Report	Disk Report	Next Keys	Select Process	Help	Exit Glance
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B3692A GlancePlus C.03.50.00 12:01:50 shady 9000/879 Current Avg High

CPU Util	SSU				3%	10%	44%
Disk Util	FFV	V			16%	55%	100%
Mem Util	S	SU		UB B	96%	51%	100%
Swap Util	U	UR	R		53%	23%	53%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	323	196629	62.1	540.9	4516.5
Page In	181	10965	34.8	30.1	623.8
Page Out	0	33867	0.0	93.1	333.2
KB Paged In	844kb	34.7mb	162.3	97.8	877.2
KB Paged Out	0kb	500.5mb	0.0	1410.0	5312.7
Reactivations	5	63	0.9	0.1	1.7
Deactivations	4	85	0.7	0.2	0.9
KB Deactivated	0kb	1.6mb	0.0	4.6	28.2
VM Reads	61	3751	11.7	10.3	77.0
VM Writes	0	34177	0.0	94.0	323.4

Total VM : 1010mb Sys Mem : 161.4mb User Mem: 538.8mb Phys Mem: 768.0mb
 Active VM: 55.3mb Buf Cache: 38.6mb Free Mem: 29.3mb

Page 1 of 1

Process List	CPU Report	Memory Report	Disk Report	Next Keys	Select Process	Help	Exit Glance
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B3692A GlancePlus C.03.50.00 12:54:02 shady 9000/879 Current Avg High

CPU Util	S	S			I	15%	3%	36%
Disk Util	V				V	99%	4%	100%
Mem Util	S	SU			UBB	99%	96%	100%
Swap Util	U		UR		R	72%	53%	72%

MEMORY REPORT

Users= 2

Event	Current	Cumulative	Current Rate	Cum Rate	High Rate
Page Faults	7462	107938	1435.0	136.9	1435.0
Page In	1	1225	0.1	1.5	63.5
Page Out	2533	32740	487.1	41.5	558.8
KB Paged In	4kb	8.3mb	0.7	10.8	214.2
KB Paged Out	43.8mb	511.5mb	8633.8	664.4	8938.4
Reactivations	0	715	0.0	0.9	3.8
Deactivations	2	745	0.3	0.9	1.9
KB Deactivated	20kb	412kb	3.8	0.5	6.3
VM Reads	2	1135	0.3	1.4	14.2
VM Writes	2865	32940	550.9	41.7	550.9

Total VM : 1.38gb Sys Mem : 161.5mb User Mem: 561.0mb Phys Mem: 768.0mb
 Active VM: 1.31gb Buf Cache: 38.4mb Free Mem: 7.1mb

Page 1 of 1

Process List
CPU Report
Memory Report
Disk Report
Next Keys
Select Process
Help
Exit Glance

B3692A GlancePlus C.03.50.00 12:55:40 shady 9000/879 Current Avg High

CPU Util	S	SU	U	I	51%	5%	51%
Disk Util	V			I	3%	6%	100%
Mem Util	S	SU	UB B	I	95%	96%	100%
Swap Util	U		UR R	I	72%	54%	72%

PROCESS LIST

Users= 2

Process Name	PID	PPID	Pri	User Name	CPU Util (200% max)	Cum CPU	Disk IO Rate	RSS	Thd Cnt
scrdaemon	1345	1	241	root	99.8/ 1.2	10.2	0.0/ 0.0	364kb	1
swapper	0	0	127	root	0.0/ 0.1	0.9	1.3/ 0.2	16kb	1
mallocbig	3315	1983	154	root	0.0/ 1.4	12.4	0.0/ 0.0	529.4mb	1

Process List
CPU Report
Memory Report
Disk Report
Next Keys
Select Process
Help
Exit Glance

B3692A GlancePlus C.03.50.00 12:57:00 shady 9000/879 Current Avg High

Resource	State	Current	Avg	High
CPU Util	S	51%	9%	52%
Disk Util		0%	5%	100%
Mem Util	S	95%	96%	100%
Swap Util	U	72%	55%	72%

Resources PID: 3315, mallocbig PPID: 1983 euid: 0 User: root

```

CPU Usage (util):      0.0 Log Reads :      0 Wait Reason :      STRMS
User/Nice/RT CPU:    0.0 Log Writes:      0 Total RSS/VSS :529.4mb/ 1.27gb
System CPU          :      0.0 Phy Reads :      0 Traps / Vfaults:      0/      0
Interrupt CPU       :      0.0 Phy Writes:      0 Faults Mem/Disk:      0/      0
Cont Switch CPU    :      0.0 FS Reads  :      0 Deactivations :      0
Scheduler          :      HPUX FS Writes:      0 Forks & Vforks :      0
Priority           :      154 VM Reads  :      0 Signals Recd  :      0
Nice Value        :      20 VM Writes :      0 Mesg Sent/Recd :      0/      0
Dispatches        :      0 Sys Reads  :      0 Other Log Rd/Wt:      0/      0
Forced CSwitch    :      0 Sys Writes:      0 Other Phy Rd/Wt:      0/      0
VoluntaryCSwitch  :      0 Raw Reads  :      0 Proc Start Time
Running CPU       :      0 Raw Writes:      0 Mon Feb 11 12:40:38 2002
CPU Switches      :      0 Bytes Xfer:      0kb
    
```

C - cum/interval toggle % - pct/absolute toggle Page 1 of 1

Process Resource

Wait States

Memory Regions

Open Files

Next Keys

Process Syscalls

B3692A GlancePlus C.03.35.00 10:34:13 e35 9000/816 Current Avg High

CPU Util	S SA		8%	14%	97%
Disk Util	V		2%	8%	67%
Mem Util	S SU UB B		83%	96%	100%
Swap Util	U UR A		53%	56%	59%

DISK REPORT

Users= 2

Req Type	Requests	%	Rate	Bytes	Cum Req	%	Cum Rate	Cum Byte
Local								
Logl Rds	11	100.0	2.1	1kb	8231	99.4	6.7	119.9mb
Logl Wts	0	0.0	0.0	0kb	50	0.6	0.0	50kb
Phys Rds	8	88.9	1.5	60kb	9146	79.0	7.5	50.7mb
Phys Wts	1	11.1	0.1	2kb	2438	21.0	2.0	9.4mb
User	0	0.0	0.0	0kb	497	4.3	0.4	6.8mb
Virt Mem	8	88.9	1.5	60kb	9478	81.8	7.8	50.2mb
System	1	11.1	0.1	2kb	1609	13.9	1.3	3.1mb
Raw	0	0.0	0.0	0kb	0	0.0	0.0	0kb
Remote								
Logl Rds	0	0.0	0.0	0kb	0	0.0	0.0	0kb
Logl Wts	0	0.0	0.0	0kb	0	0.0	0.0	0kb
Phys Rds	0	0.0	0.0	0kb	0	0.0	0.0	0kb
Phys Wts	0	0.0	0.0	0kb	0	0.0	0.0	0kb

Page 1 of 2

Process List	CPU Report	Memory Report	Disk Report	Next Keys	Select Process	Help	Exit Glance
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B3692A GlancePlus C.03.35.00 10:35:22 e35 9000/816 Current Avg High

CPU Util	S	SAARUU	I	46%	15%	97%
Disk Util	F		I	76%	9%	76%
Mem Util	S	SU	I	97%	95%	100%
Swap Util	U	UR	I	54%	56%	59%

		DISK REPORT						Users= 2	
Req	Type	Requests	%	Rate	Bytes	Cum Req	%	Cum Rate	Cum Byte
Local	Logl Rds	36	100.0	6.6	997kb	8565	99.4	6.6	126.7mb
	Logl Wts	0	0.0	0.0	0kb	52	0.6	0.0	50kb
	Phys Rds	323	69.5	59.8	760kb	10998	79.4	8.5	55.2mb
	Phys Wts	142	30.5	26.2	489kb	2854	20.6	2.2	10.4mb
	User	3	0.6	0.5	24kb	525	3.8	0.4	6.9mb
	Virt Mem	58	12.5	10.7	232kb	9897	71.4	7.7	51.9mb
	System	404	86.9	74.8	993kb	3430	24.8	2.6	6.8mb
Raw	0	0.0	0.0	0kb	0	0.0	0.0	0kb	
Remote	Logl Rds	0	0.0	0.0	0kb	0	0.0	0.0	0kb
	Logl Wts	0	0.0	0.0	0kb	0	0.0	0.0	0kb
	Phys Rds	0	0.0	0.0	0kb	0	0.0	0.0	0kb
	Phys Wts	0	0.0	0.0	0kb	0	0.0	0.0	0kb

Process List

CPU Report

Memory Report

Disk Report

Next Keys

Select Process

Help

Exit Glance

B3692A GlancePlus C.03.35.00 10:36:10 e35 9000/816 Current Avg High

CPU Util	S	SAARU U	I	53%	51%	53%
Disk Util	F	FV U	I	72%	82%	91%
Mem Util	S	SU UB B	I	96%	97%	97%
Swap Util	U	UR R	I	60%	60%	60%

Idx	File System	IO BY FILE SYSTEM		Users= 2	
		Device	Type	LogI IO	Phys IO
1	/	/dev/vg00/lvol3	vxfs	2.8/ 3.1	7.6/ 7.1
2	/stand	/dev/vg00/lvol1	hfs	0.6/ 0.5	0.6/ 0.5
3	/var	/dev/vg00/lvol8	vxfs	1.7/ 2.1	27.2/ 23.5
4	/usr	/dev/vg00/lvol7	vxfs	2.6/ 2.9	58.5/ 56.3
5	/tmp	/dev/vg00/lvol4	vxfs	0.0/ 0.0	0.0/ 0.0
6	/opt	/dev/vg00/lvol6	vxfs	0.0/ 0.2	0.9/ 1.8
7	/home	/dev/vg00/lvol5	vxfs	0.0/ 0.0	0.0/ 0.0
8	lvm swap device	/dev/vg00/lvol2	hfs	0.0/ 0.0	10.4/ 13.3

Top disk user: PID 24075, du 82.7 IOs/sec S - Select a Disk Page 1 of 1

IO By File Sys	IO By Disk	IO By LogI Vol	Swap Space	Next Keys	CPU By Processr	Alarm History	Select
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```

B3692A GlancePlus      B.09.01      1:44:59 hpuerci  9000/897 Current Avg High
-----
Cpu Util   SN                               | 4%   6%  29%
Disk Util  F                               | 3%   2%   3%
Mem Util   S SU                               UB B | 95%  95%  95%
Swap Util  U                               UR   R | 83%  83%  83%
-----

```

NFS by SYSTEM DETAIL

Users=22

Idx	System	Server (inbound)			Client (outbound)			
		ReadRt	WriteRt	RespTm	ReadRt	WriteRt	RespTm	NetwkTm
1	patch	0.0	0.0	0ms	0.0	0.0	0ms	0ms
2	hpuerca	0.0	0.0	0ms	0.0	0.0	0ms	0ms
3	c2426209.nsr.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
4	c2426127.nsr.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
5	v3191dan.ssr.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
6	mister_t.atl.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
7	hpuers2.atl.hp.co	0.0	0.0	0ms	0.0	0.0	0ms	0ms
8	naetinfo.atl.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
9	hp3117mb.ssr.hp.c	0.0	0.0	0ms	0.0	0.0	0ms	0ms
10	lyra.atl.hp.com	0.0	0.0	0ms	0.0	0.0	0ms	0ms

S - Select a system C - cum/interval toggle

Page 1 of 4

Global

CPU

Memory

Disk

Next
KeysSelect
Process

Help

Exit
Glance

130.1



HP2392A -- COM1(19200)

?

Enter

Insert

Num

Caps

Stop

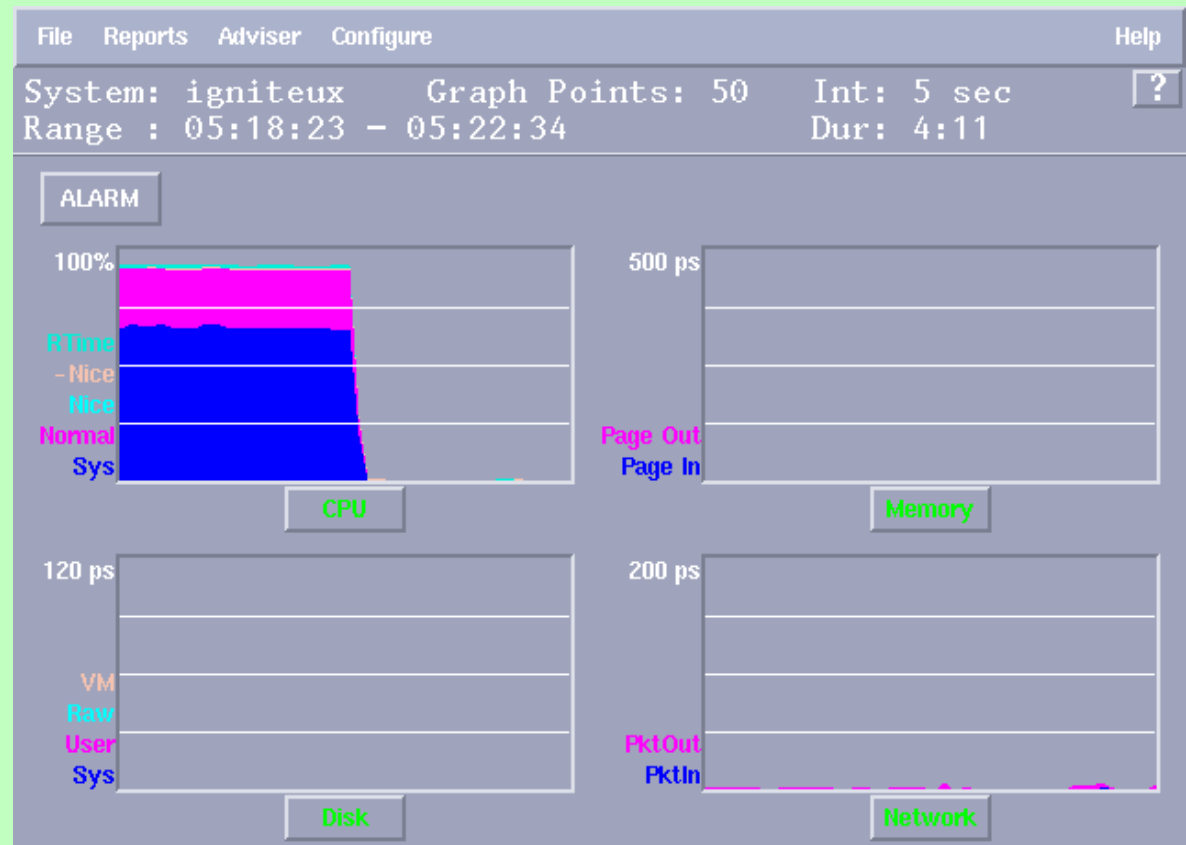
gpm (Motif version)

■ gpm

- [-nosave]
- [-rpt [rptname]]
- [-sharedclr]
- [-nice nicevalue]
- [-lock]
- [-disks <n>]
- [-kernel <path>]
- [-nfs <n>]
- [-pids <n>]
- [Xoptions]

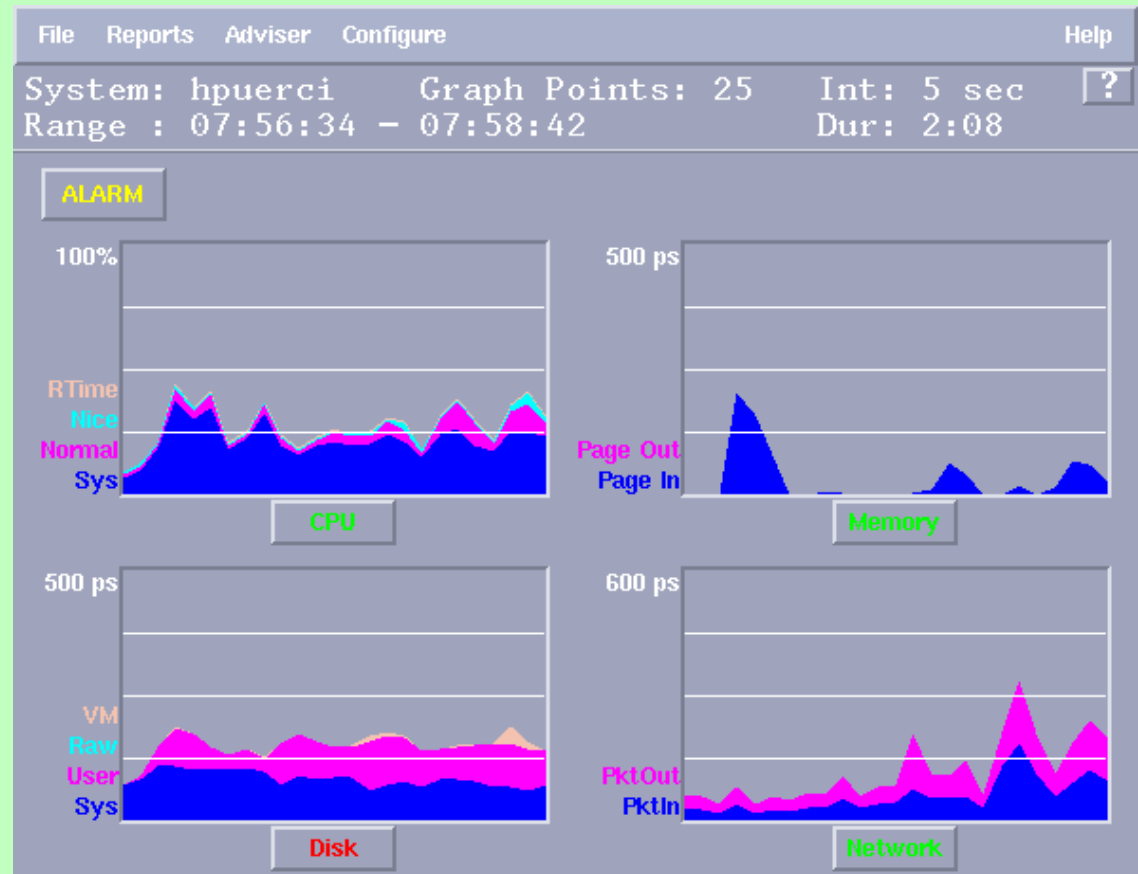
CPU saturated

```
while :  
do  
:  
done
```



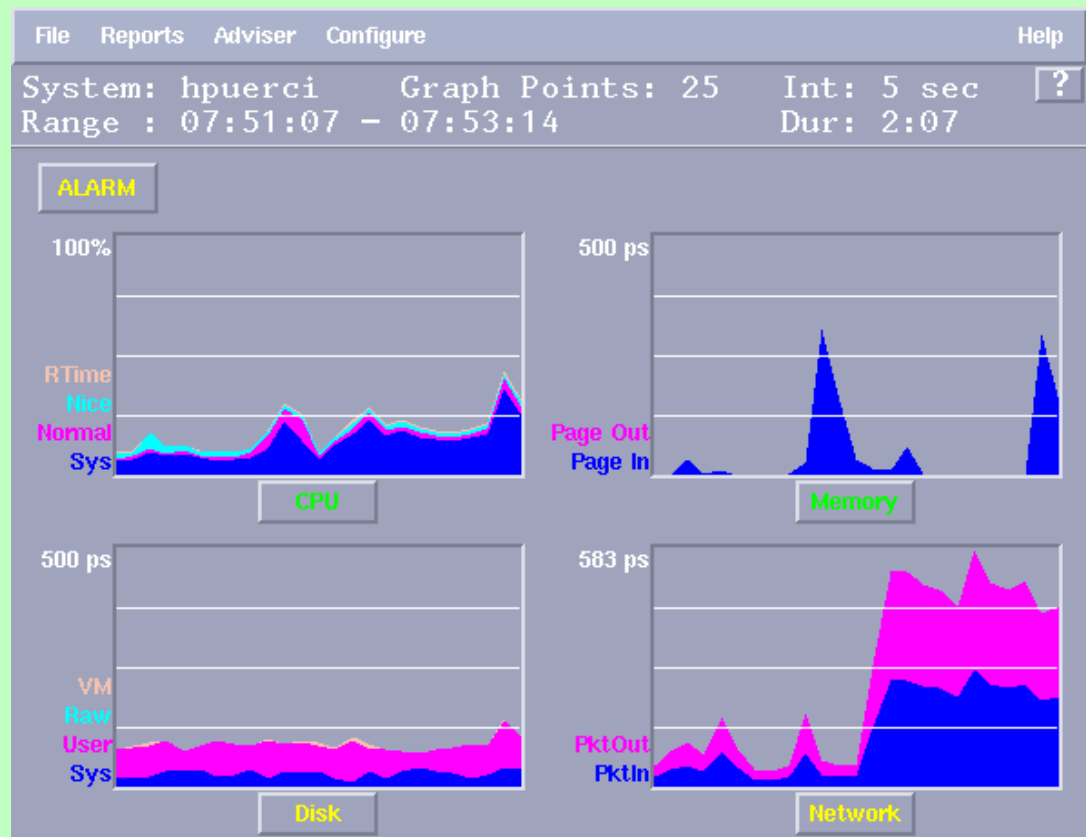
Disk saturated

```
du / > /dev/null
```

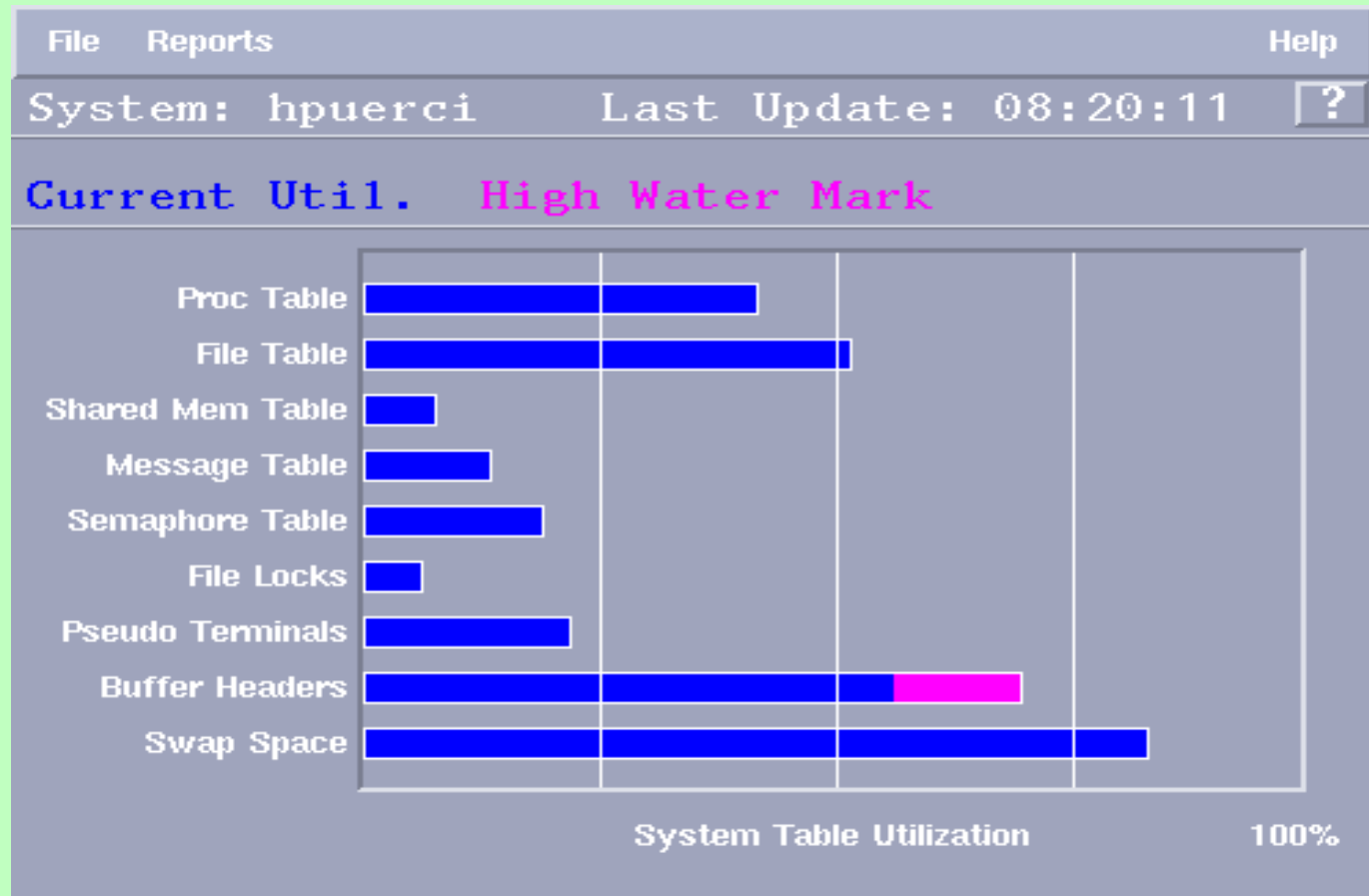


Network saturated

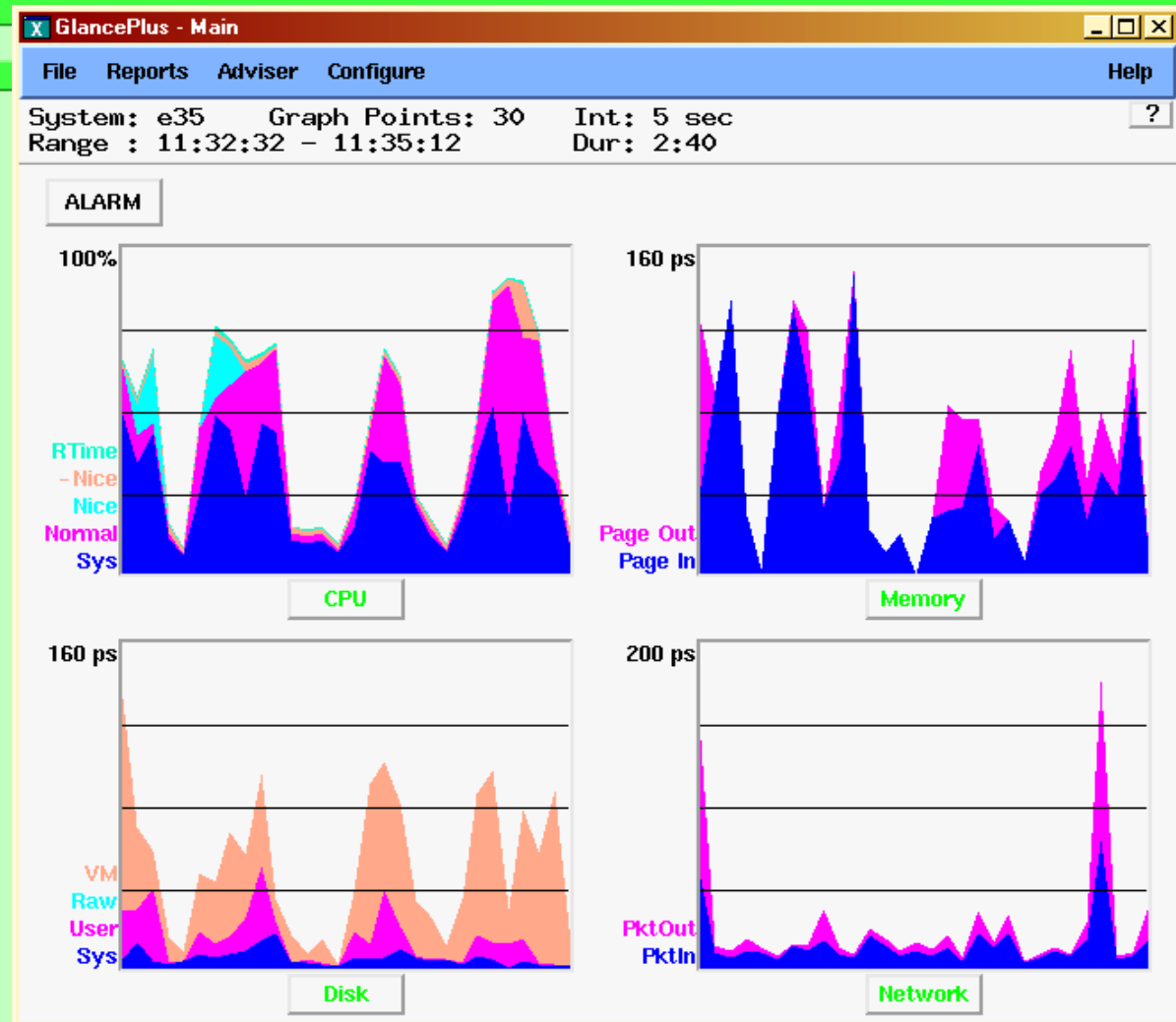
```
du /nfs1 > /dev/null
```



Resource Chart

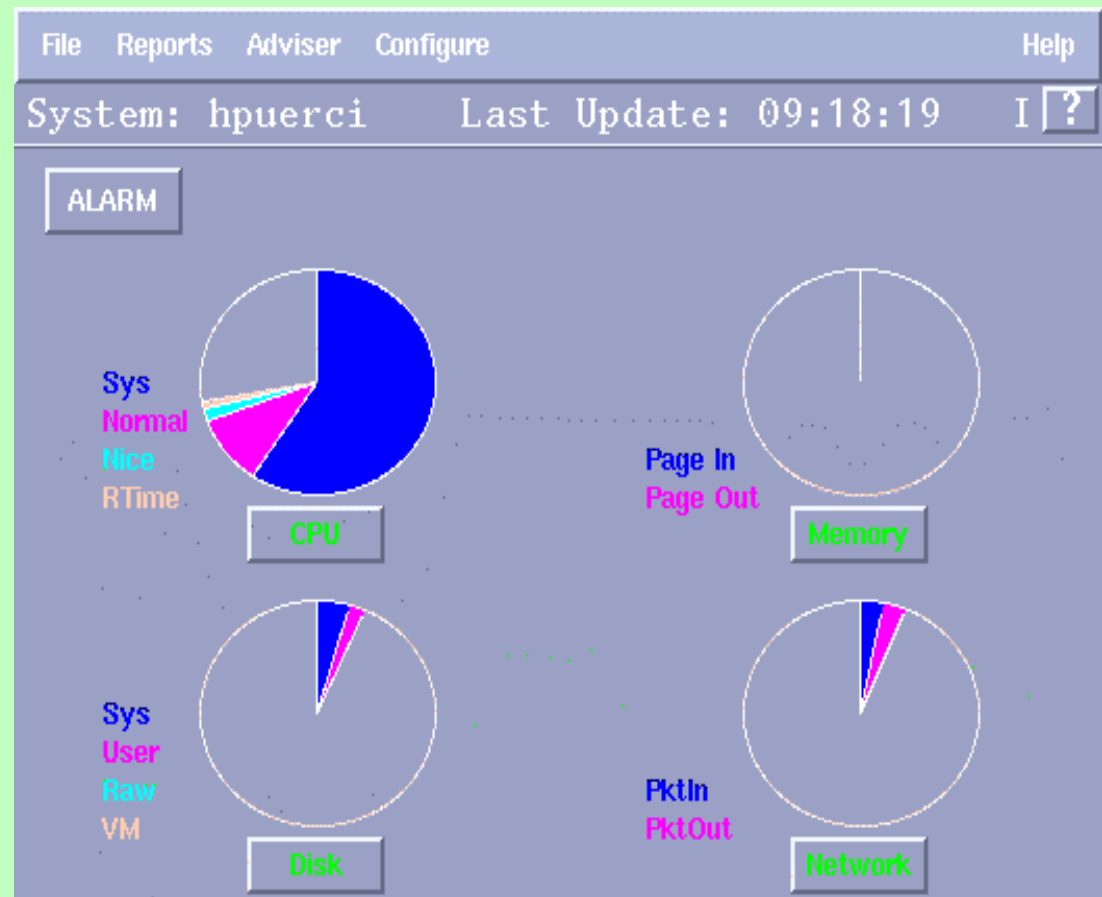


High swapping



Alternate representation

Pie charts
(CPU bound)



Conclusions

- Isolate CPU versus I/O problems
 - CPU-bound
 - swap (RAM) pressure
 - I/O (LAN, disk, tape, etc)
- Tools
 - Unix classics
 - Glance and Measureware
- HP Training Courses