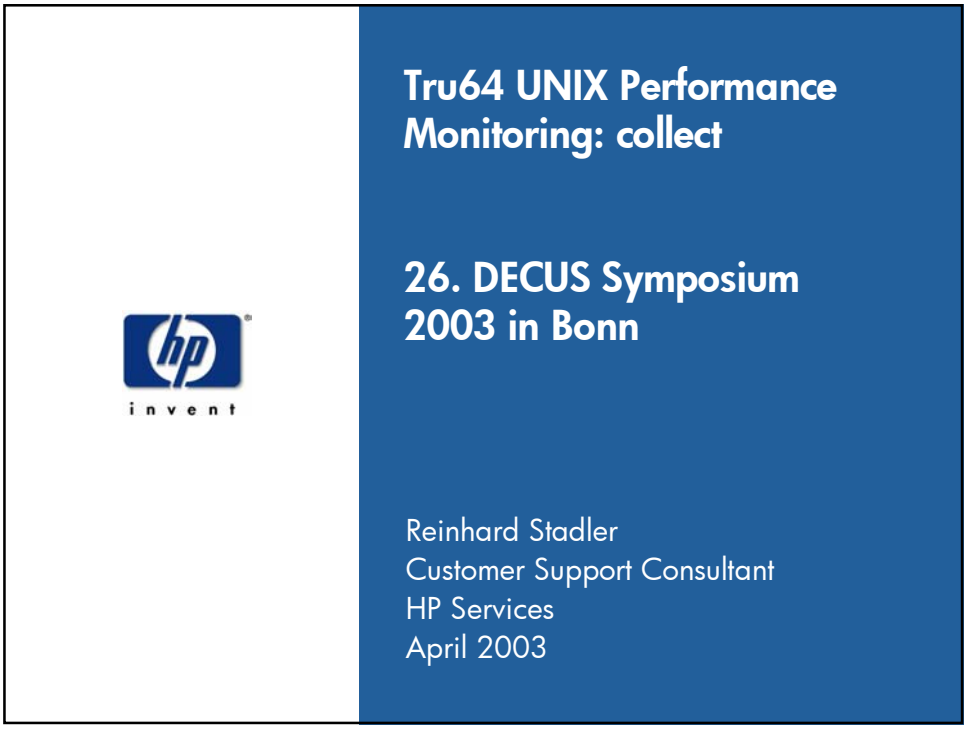
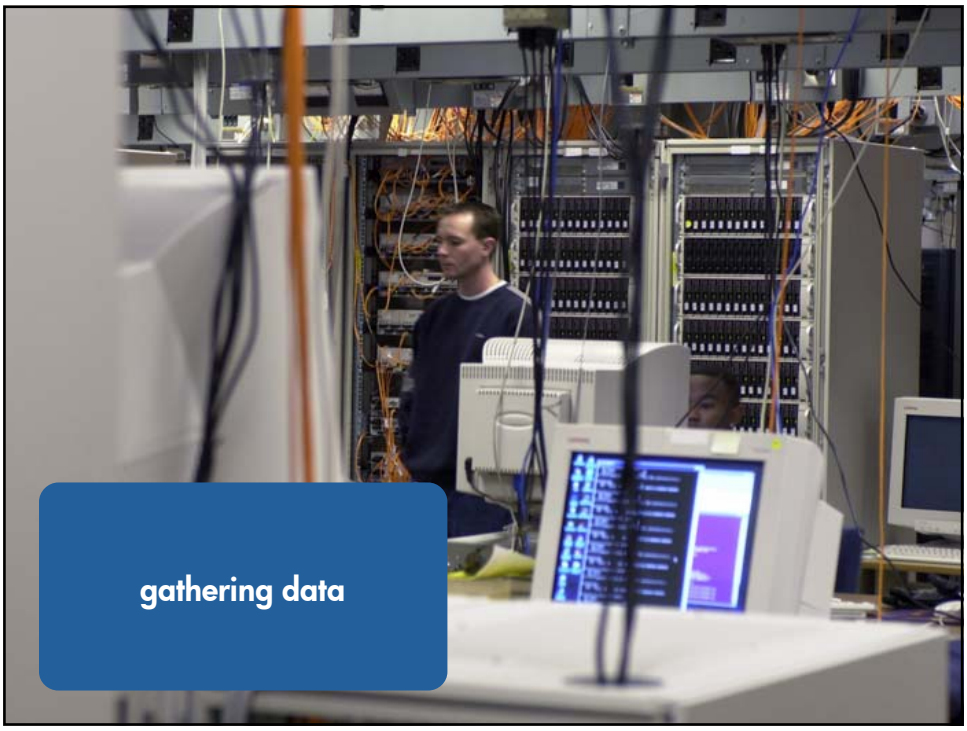


Agenda

- Overview
- Collecting performance data
- Analyzing data and displaying results
- Advanced techniques

Overview

- Collects operating system data under Compaq Tru64 UNIX
  - either interactive mode or historical mode
- Tightly integrated associated tools:
  - collgui
    evaluate data gathered by collect using collect, cfilt, and gnuplot
  - cfilt
    extracts arbitrary values from the output of collect
- Has become the standard tool for Tru64 UNIX performance monitoring



Collect Features

- Records specific operating system data
  - Display data in text format
  - Store it in compressed binary format
  - Any set of the subsystems be included or excluded
  - A collection interval can be specified
- Plays back data files
- Automatic start on boot with logfile rollover and cleanup
- Automatic termination after a given time or a specified number of collection intervals

Example: collect

```
# collect -f collect_data -a
Initializing (10.0 seconds) ... done.

#### RECORD     1 ...

^C
Ouch!

# collect –p collect_data.cgz
```

Select Subsystems to be monitored

```
# collect -s [pmdtlncfqyh]
# collect -e [pmdtlncfqyh]
```

- **p** process statistics
- **m** memory usage
- **d,t,l** disk, tape, LSM statistics
- **n** network
- **c** CPU statistics
- **f** file system
- **q** message queues
- **y** tty
- **h** header information

Collection Interval

- Use **-i** to specify a time value in seconds for
  - the collection interval
  - the process interval
- Collect is designed to use less than 1% of system resources if sampling is performed at 30-second or greater intervals

Automatic Starting on Boot

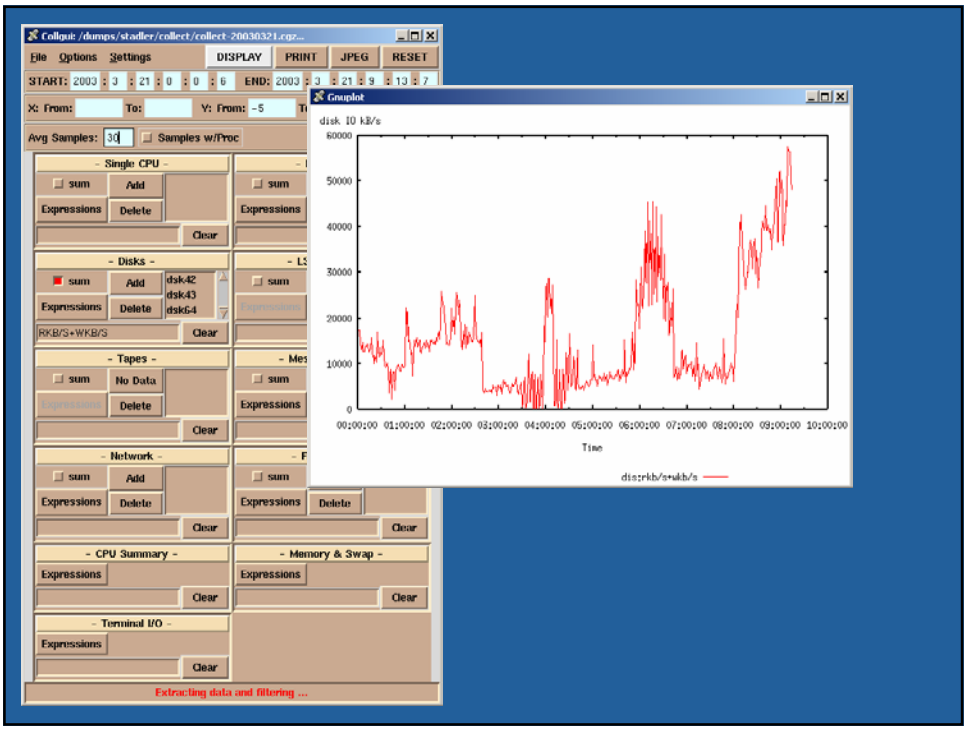
- Collect can be configured to start automatically on boot
  Useful for continuous monitoring
- `/etc/rc.config` values:
  `COLLECT_AUTORUN`
  `COLLECT_ARGS`
- Default values are:

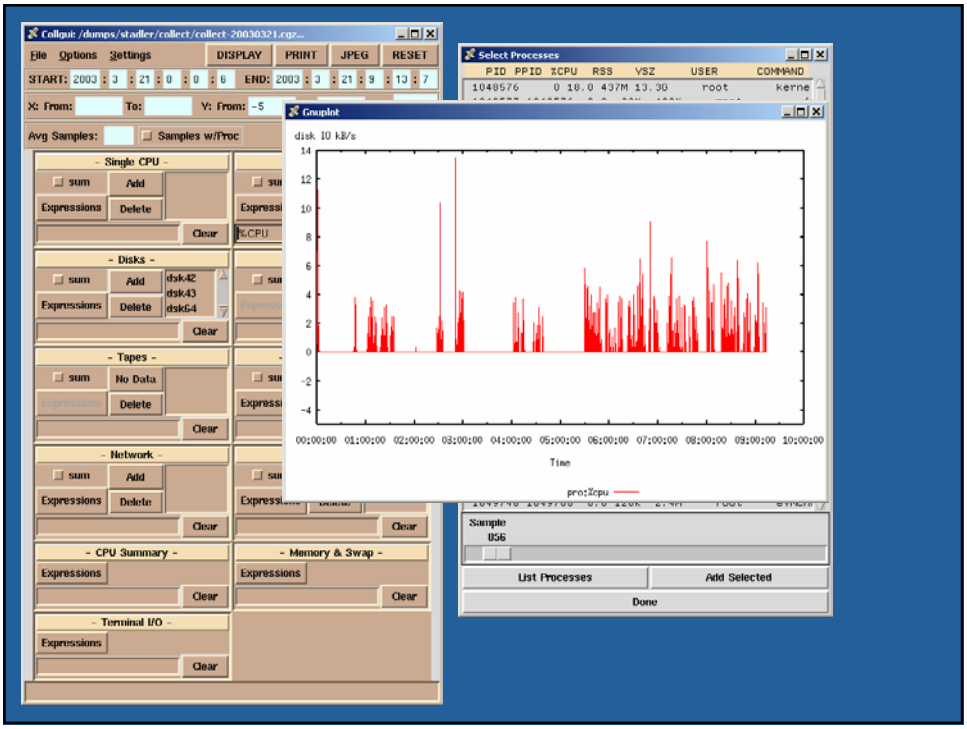
```
-i60,120
-f /var/adm/collect.dated/collect
-H d0:5,1w
-W 1h -M 10,15

collect_init@07-Apr-00:05:02.cgz
```


collgui

- GUI used to analyze collect data
- Uses cfilt to filter extracted data
- Calls gnuplot to produce a graphical rendition
- Simply to use, even without detailed knowledge of cfilt

```
# collgui collect_output_file.cgz &

# collgui -live collect_output_file.cgz &
```

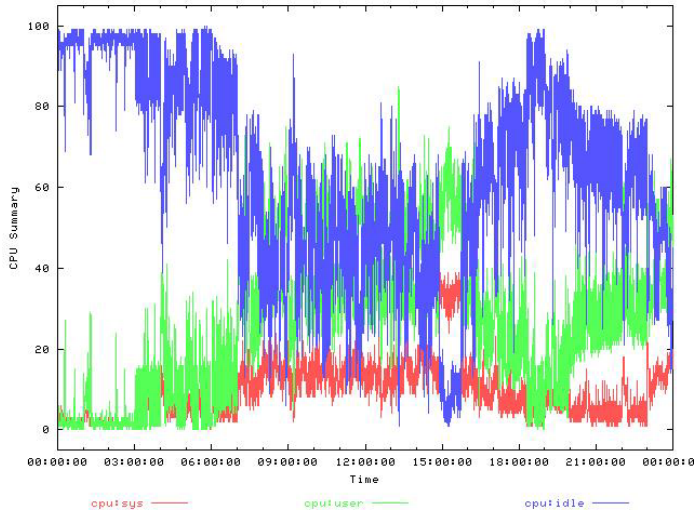





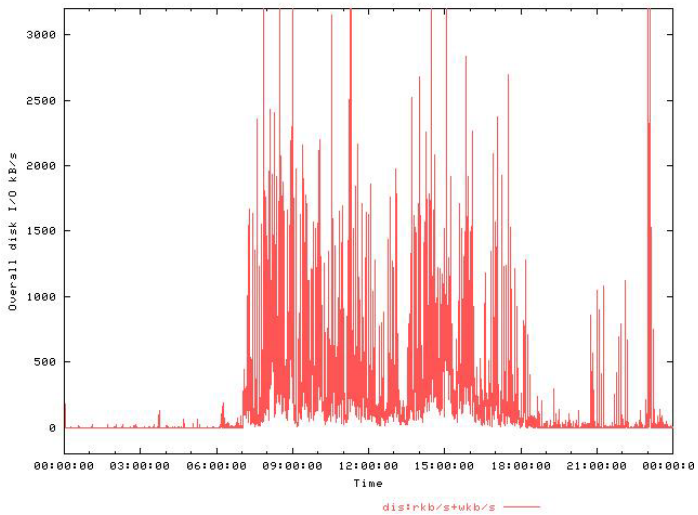
Getting an Overview

- Get collection details
  `# collect -p collect_file.cgz -sh`
- CPU summary:
  user, system, idle
- Memory usage
- Disk I/O
  if there are a lot of disk, check overall transfer first
- Network I/O
  for each interface

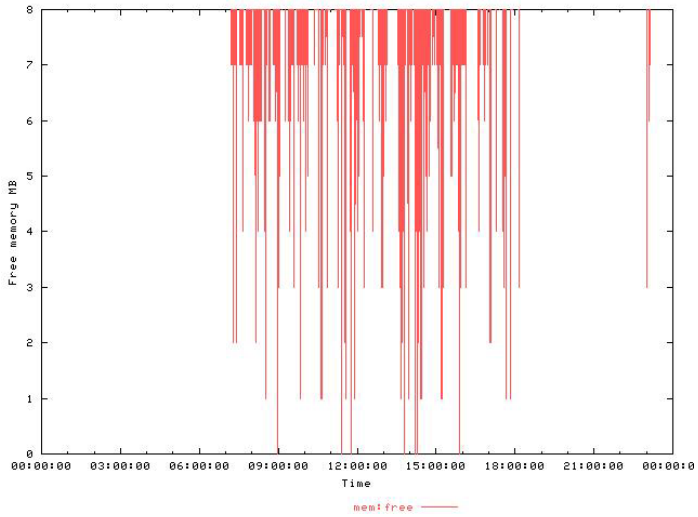
Example: CPU Summary

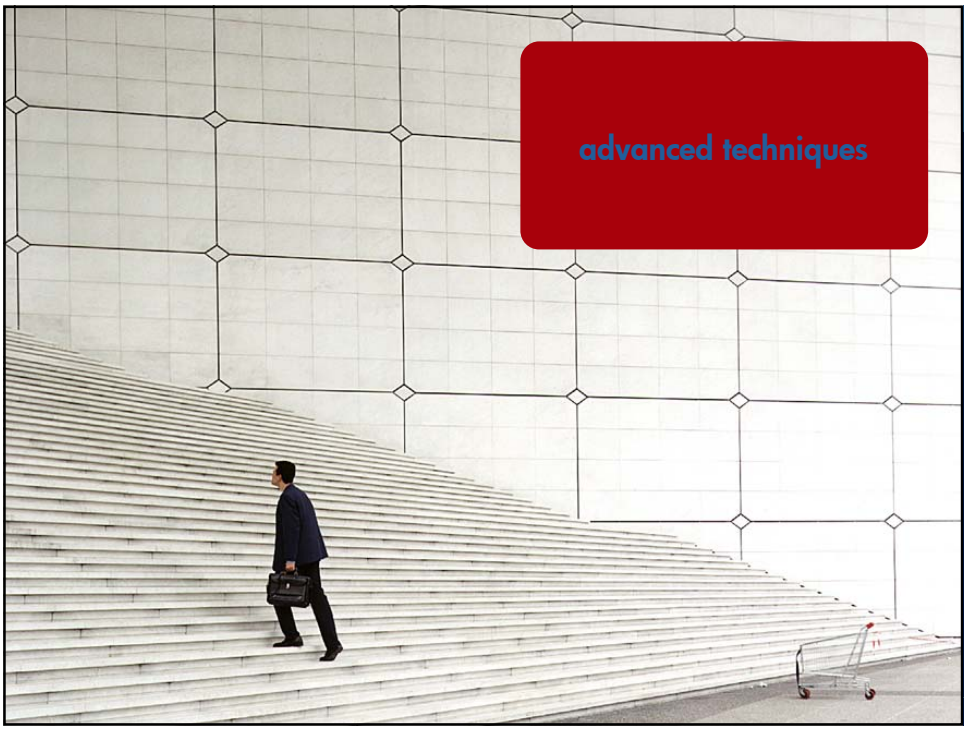


Example: Overall Disk I/O



Example: Memory Usage





Exporting Data

- collect can be used to export data to other applications (e.g. to be plotted in Excel)
- Run collgui in debug mode:
  `# collgui -d collect_data_file.cgz`
- Select the desired subsystems and click on Display
- collgui creates a file in the **/var/tmp** directory
- This file can be imported into Excel

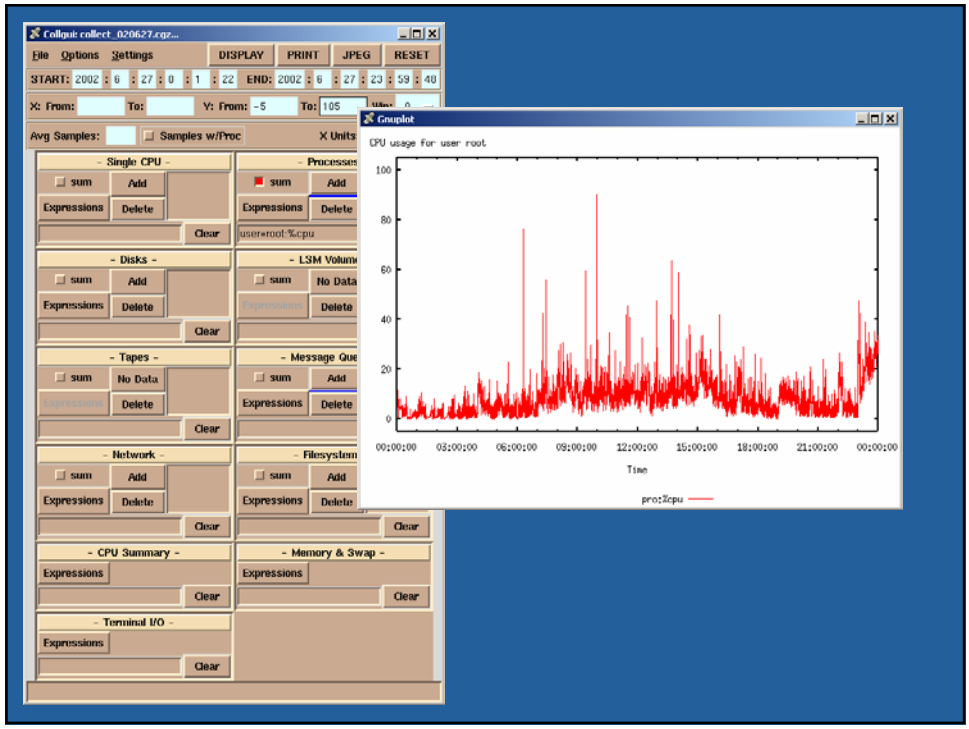
cfilt

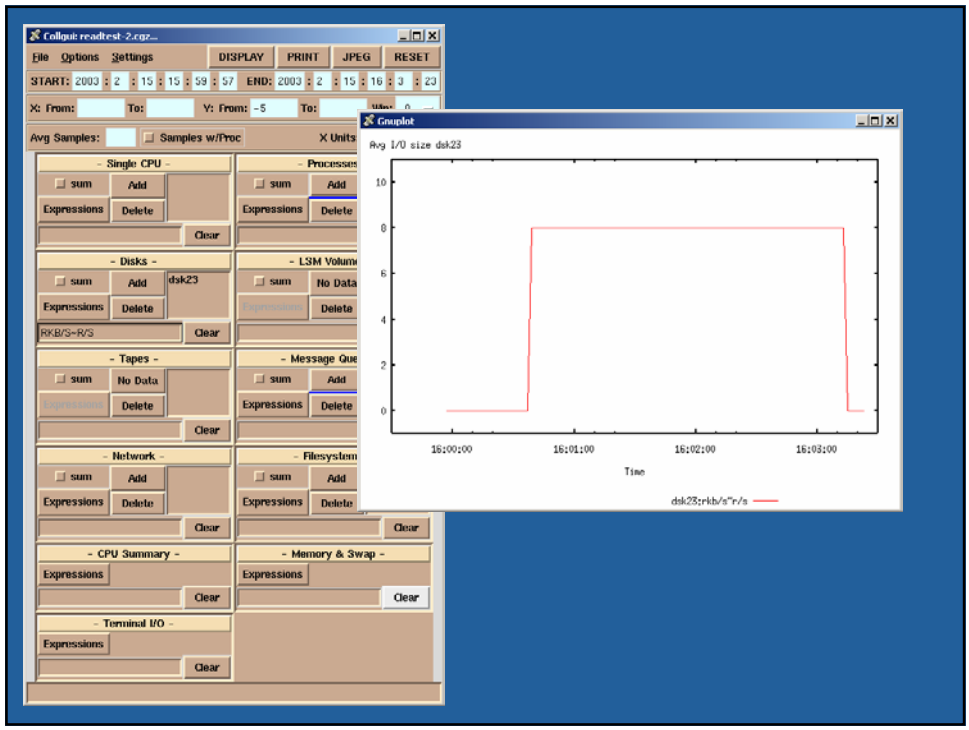
- A filter for Collect

```
# cfilt [-aN] [-f [input-file]        \
  [expression] [expression ...]] [-p]
```

- Examples

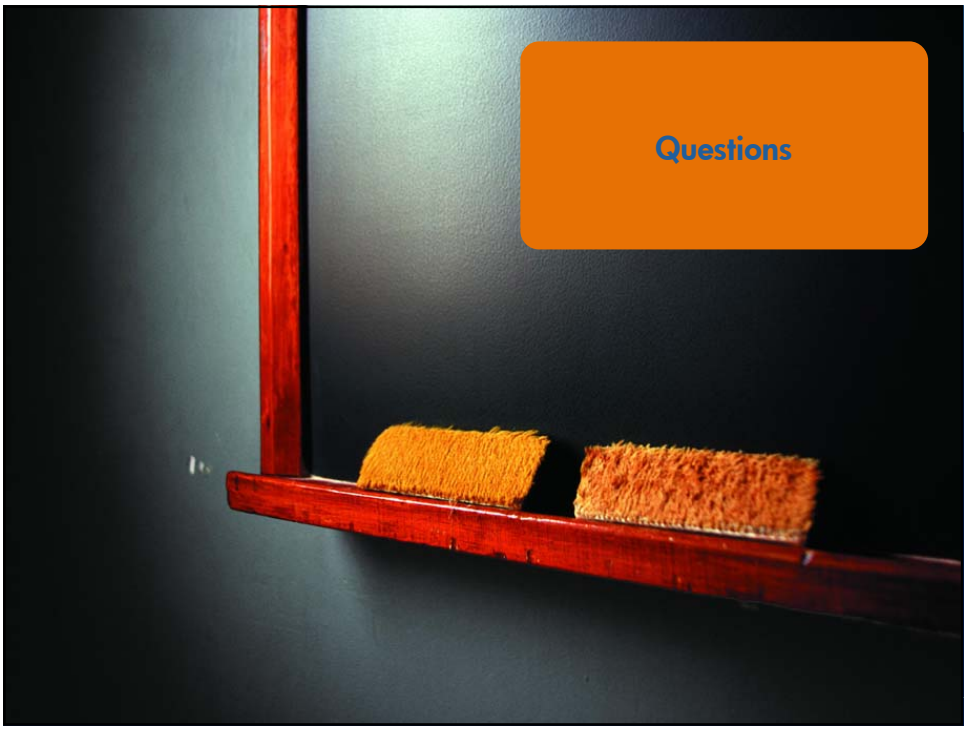
```
# cfilt -f ... cpu:sys:user:idle
# cfilt -f ...                        \
   `dis+:name=dsk1,dsk2:rkb/s+wkb/s`
# cfilt -f ... `pro+:user=oracle:%cpu`
```

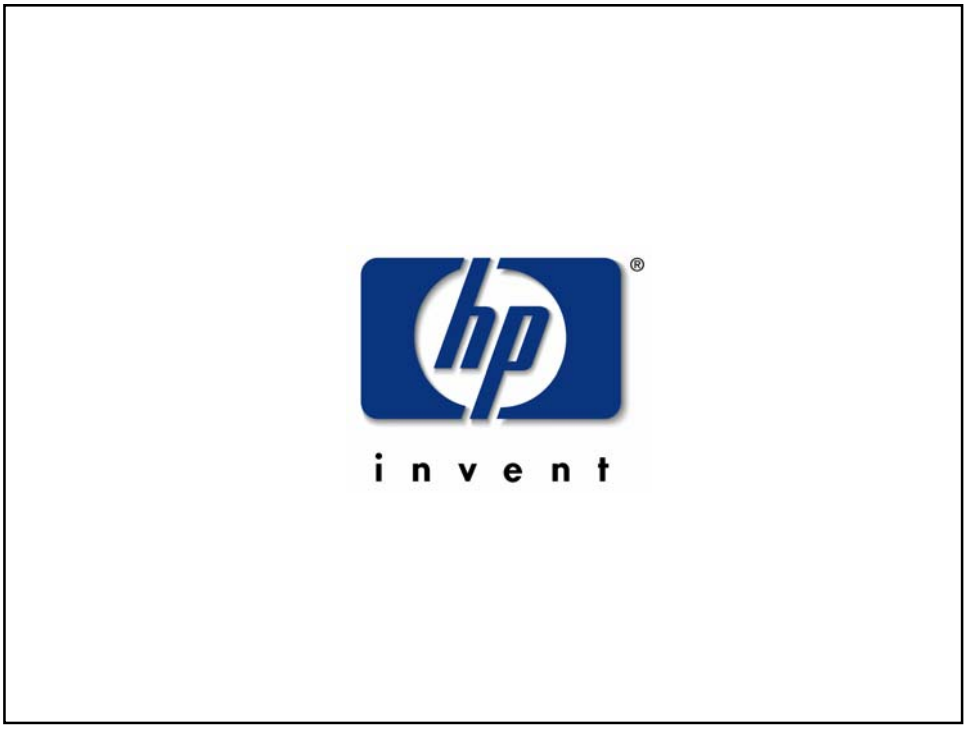

Collgui: collect_020627.cgz...
File Options Settings
DISPLAY PRINT JPEG RESET
START: 2002 : 6 : 27 : 0 : 1 : 22 END: 2002 : 6 : 27 : 23 : 59 : 40
X: From: To: Y: From: -5 To: 105
Avg Samples: Samples w/Proc X Units
- Single CPU -
- Processes -
- Disks -
- LSM Volume -
- Tapes -
- Message Que -
- Network -
- Filesystem -
- CPU Summary -
- Memory & Swap -
- Terminal I/O -
sum Add Expressions Delete Clear
No Data
user=root:%cpu
Gnuplot
CPU usage for user root
100
80
60
40
20
0
00:00:00 03:00:00 06:00:00 09:00:00 12:00:00 15:00:00 18:00:00 21:00:00 00:00:00
Time
proc%cpu


Collgui: readtest-2.cgz...
File Options Settings
DISPLAY PRINT JPEG RESET
START: 2003 : 2 : 15 : 15 : 59 : 57 END: 2003 : 2 : 15 : 16 : 3 : 23
X: From: To: Y: From: -5 To:
Avg Samples: Samples w/Proc X Units
- Single CPU -
- Processes -
- Disks -
- LSM Volume -
- Tapes -
- Message Que -
- Network -
- Filesystem -
- CPU Summary -
- Memory & Swap -
- Terminal I/O -
sum Add Expressions Delete Clear
dsk23
RKB/S~R/S
No Data
Gnuplot
Avg I/O size dsk23
10
8
6
4
2
0
16:00:00 16:01:00 16:02:00 16:03:00
Time
dsk23:rkb/s~r/s

Example

- Automatically start collect after each reboot
- Run collect as a cron job to extract performance data to text file
- Setup scripts that use any graphic tool (e.g. gnuplot) to draw graphs.
- Setup a central system (e.g. a WebServer) to hold output of all monitored systems

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