Introduction to Performance Toolkit for VM

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IBM
Performance
Toolkit for VM

Topics

- Some History
- Direction
- Functions
  - Basic Mode
  - Performance Monitoring
  - Batch Mode
  - OMEGAMON XE on z/VM and Linux

IBM Performance Toolkit for VM

Some History

RealTime Monitor

- *Dependent on CP control blocks*
- *Recompile on system*

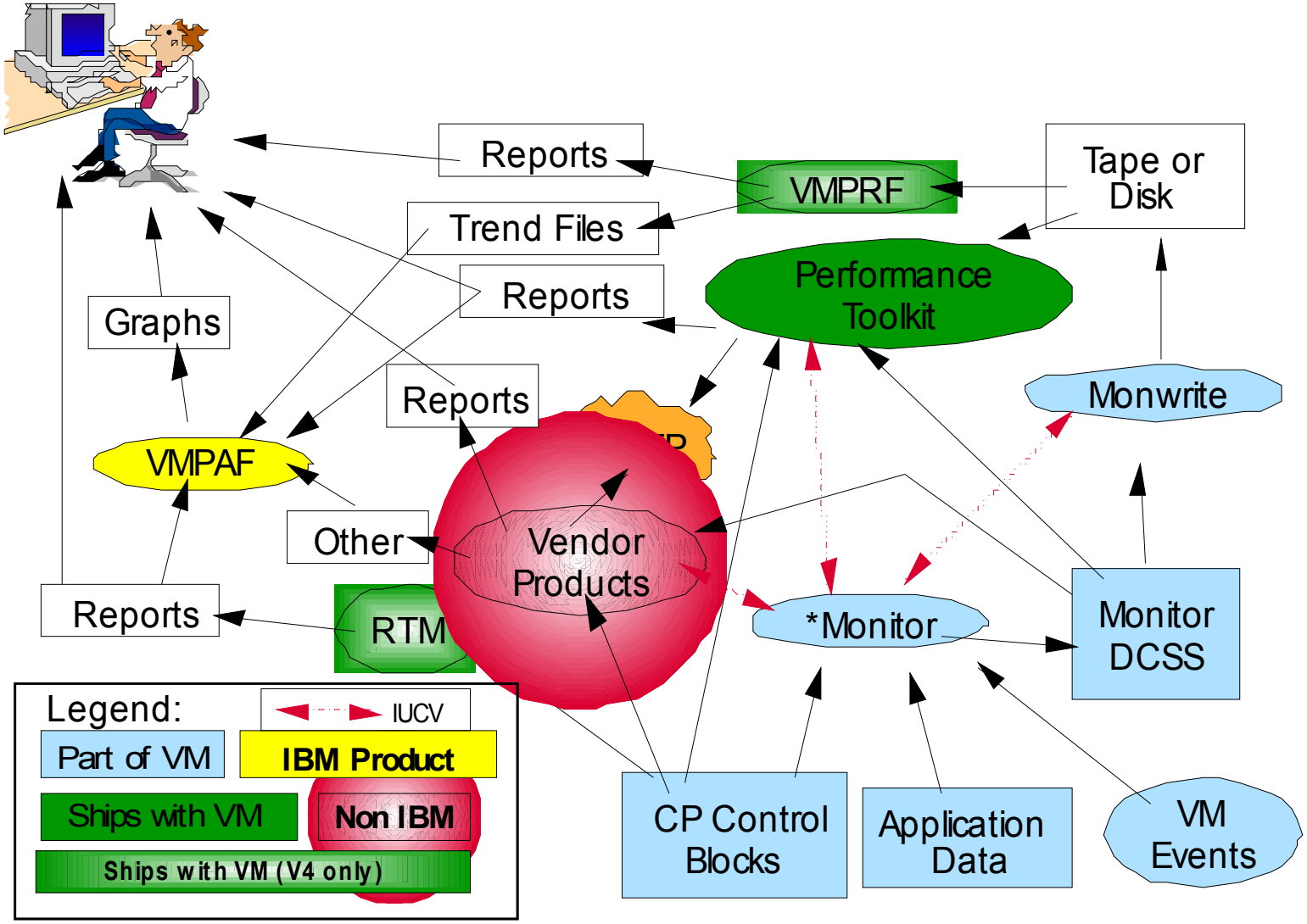
VMPRF

- *Required PL/I or LE*
- *Slow*

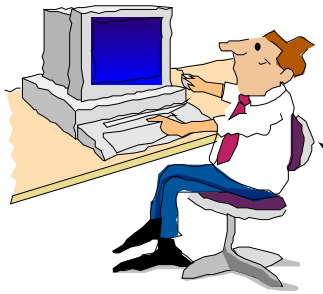
FCON/ESA

- *Most of the function of the others*
- *Plus...TCP/IP, LINUX, Web, Graphics....*

Performance Data Food Chain



Performance Data Food Chain



Graphs

Trend Files

Reports

Reports

HTTP

Tape or Disk

Performance Toolkit

Monwrite

Monitor DCSS

Vendor Products

*Monitor

CP Control Blocks

Application Data

LINUX APPLDATA

VM Events

Legend:

IUCV

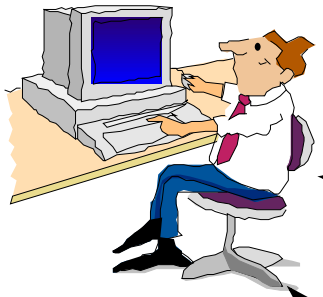
Part of VM

IBM Product

Ships with VM

Non IBM

Performance Data Food Chain



Graphs

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OMEGAMON XE

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Monitor DCSS

CP Control Blocks

Application Data

LINUX APPLDATA

VM Events

Legend:

IUCV

Part of VM

IBM Product

Ships with VM

Non IBM

IBM Performance Toolkit for VM

Performance Product Strategy

VMPRF and RTM phased out

- high development costs

FCON/ESA phased in as Performance Toolkit for VM

- adds significant new function
- focus on a single product

Synergy with other IBM Offerings

- OMEGAMON XE

Continue to encourage vendor activity

- competition breeds excellence
- greater percentage of customer needs met

Perfkit feature levels

- FL440 – with z/VM 4.4.0 – **not in service**
  - First introduction
  - Mostly RTM replacement
- FL510 – with z/VM 5.1.0 **– not in service**
  - Added BATCH mode
  - Mostly VMPRF replacement
  - Linux Appldata support
- FL520 – with z/VM 5.2.0 - **not in service**
  - Mostly 64 bit
  - New/Changed reports for system execution space
- FL530 – with z/VM 5.3.0
  - New virtual network reports
  - New/changed reports for mixed engines
  - Passphrase support
  - Sharing data with OMEGAMON XE
  - Use of VMDUMPTL
  - Ship text
  - Book split into Guide and Reference
- FL540 – with z/VM 5.4.0
  - Use monitor data instead of Diagnose x'04'for:
    - FCX102 – SYSTEM COUNTERS FCX100 - CPU
    - FCX104 - PRIVOPS
  - Support for z/VM dynamic memory configuration
    - FCX103 – STORAGE UTILIZATION
    - FCX254 - AVAILLOG
  - Support for Relative Share
    - FCX112 - USER
    - FCX226 – UCONF
  - Provide "user banner" capability before web login
- FL610 with z/VM 6.1.0
  - 5.4.0 APAR Service roll-up of all z/VM
  - Support for VMPRF compatibility dropped

IBM Performance Toolkit for VM

Program Functions

- *System Operation in Full-Screen Mode*

  (Full Screen Operator CONsole)
- *Realtime Performance Monitoring*

  Central monitoring facility for multiple systems

  Multiple (remote, WWW) access to realtime performance data
- *Performance History Data Processing*
- *"BATCH" processing similar to VMPRF*

Performance Toolkit Naming

- FCON = Full Screen Operator Console
  - FCON/XA, FCON/ESA
- FCX = 3 letter module prefix
  - used in messages, displays, etc.
- Performance Toolkit for VM = full name
- PERFKIT = module that invokes it
- PERFSVM = default userid it runs in
- FCXRES00 = default APPC resource name
- 5VMPTK40 = installation userid for FL540
- 6VMPTK10 = installation userid for FL610

Control Files

- FCONX $PROFILE
  - Invoked at startup
  - Contains setup and commands
- FCONX REPORTS
  - List of reports to be automatically generated
- FCONRMT SYSTEMS
  - Used for Central Data Collection
  - Identifies Systems from which to collect data
- FCONRMT AUTHORIZ
  - Used for Central Data Collection, APPC and WEB

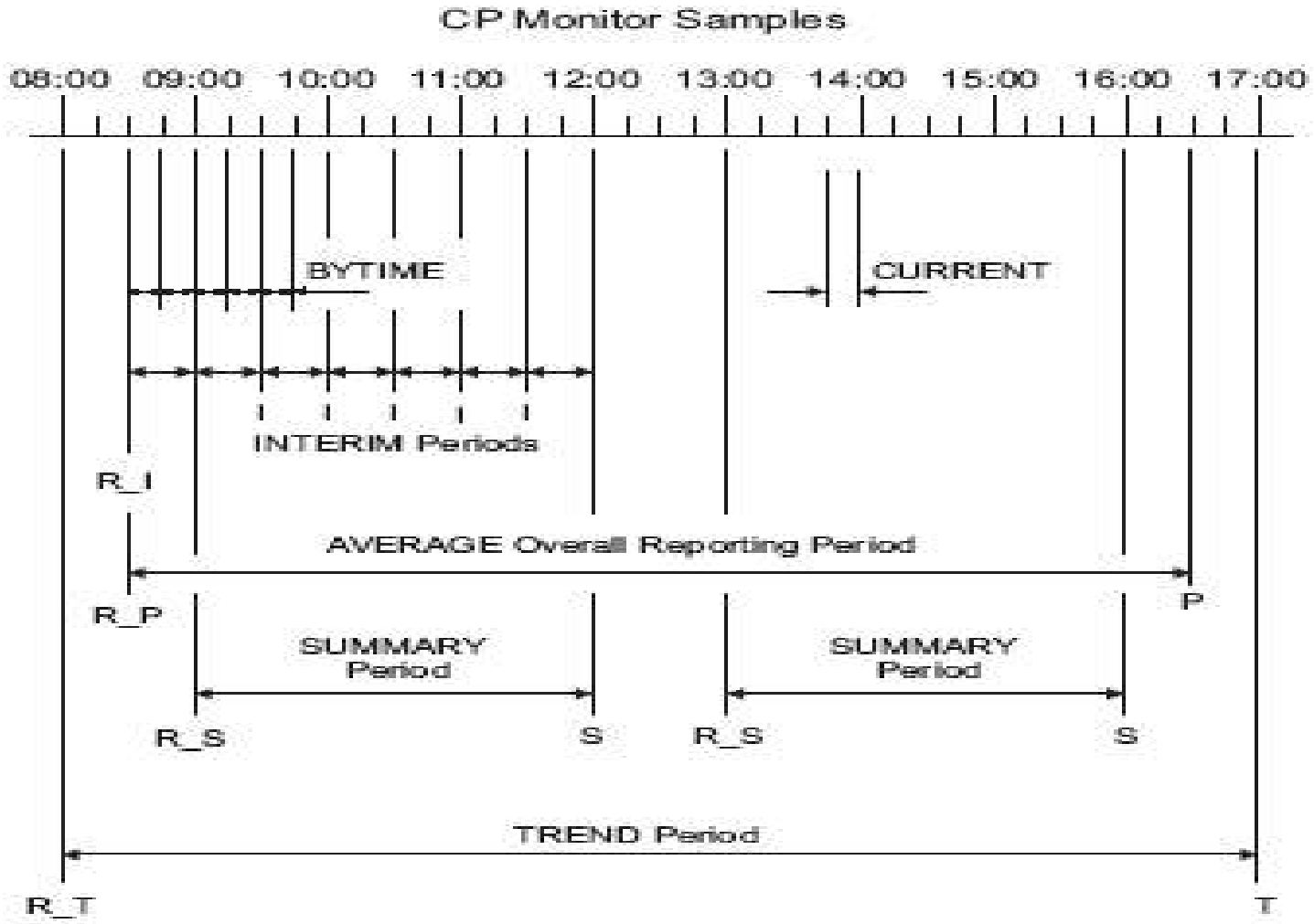
Usages

- Real time Monitor
  - Allows viewing of current status of the system
  - Scheduled report generation
  - Recording for historical records
- MONSCAN
  - View MONWRITE Data as if you were looking at live system
- BATCH or VMPRF
  - Post processing of MONWRITE data
- Re-display of historical records
- Systems Operations

Time Periods Example

- CP MONITOR SAMPLE INTERVAL 5 MIN
- CP MONITOR SAMPLE RATE 1 SEC
- FC MONCOLL RESET 08:30R_P 16:30P
- FC MONCOLL RESET 09:00R_S 12:00S 13:00R_S 16:00S (MERGE
- FC MONCOLL RESET 08:00R_T 17:00T (MERGE
- FC MONCOLL RESET 08:30R_I 09:00I 09:30I 10:00I … (MERGE
  - Or use FC SETTING INTERIM 30
- FC SETTING BYTIME 15
- Results:
  - Reports automatically generated at 16:30 covering 8:30-16:30 along with Interim reports of 30 minute periods.
  - Two Summary files created spanning 9:00-12:00 and also 13:00-16:00
  - Trend file appended to with data spanning 8:00-17:00

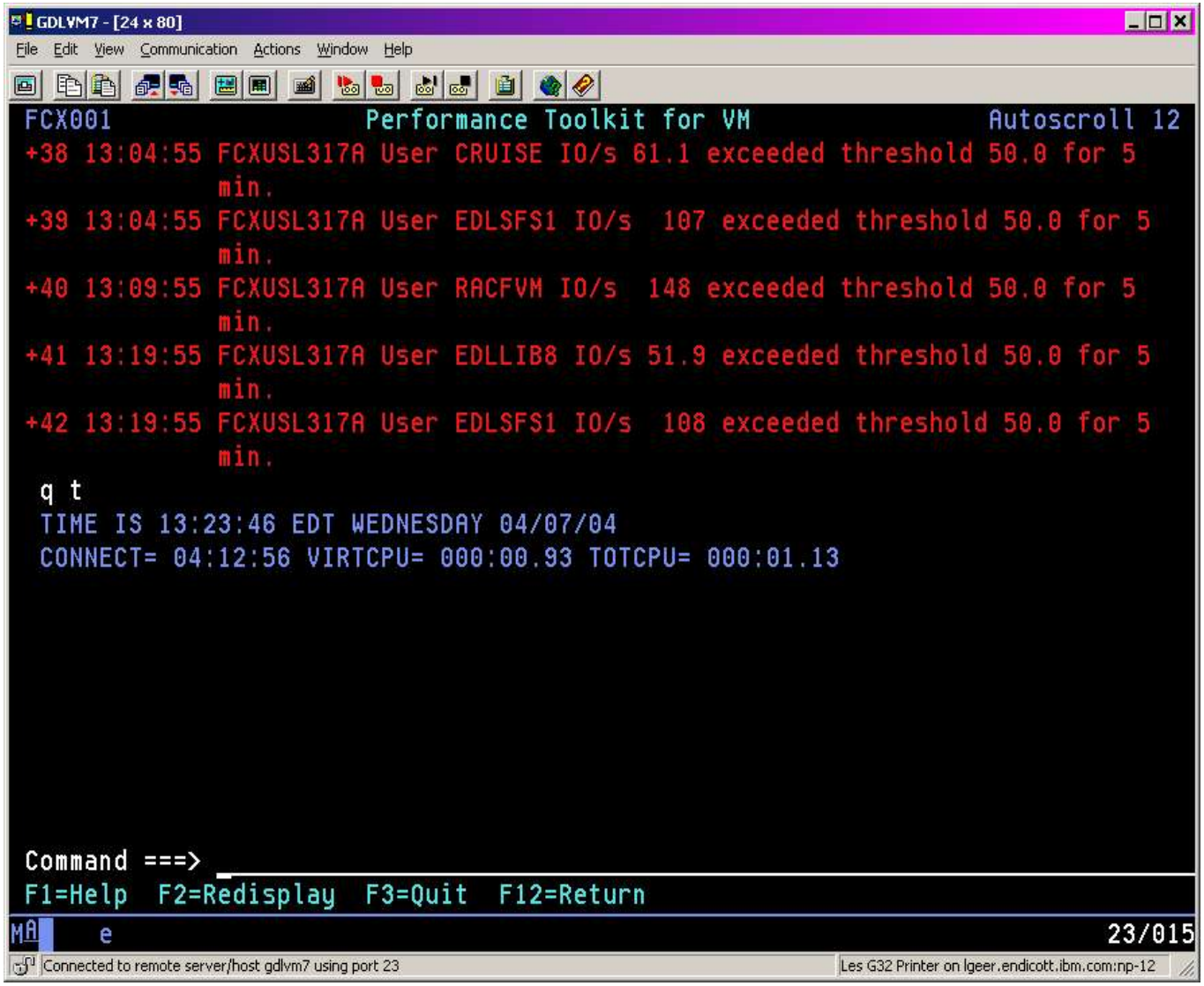
Time Periods Picture



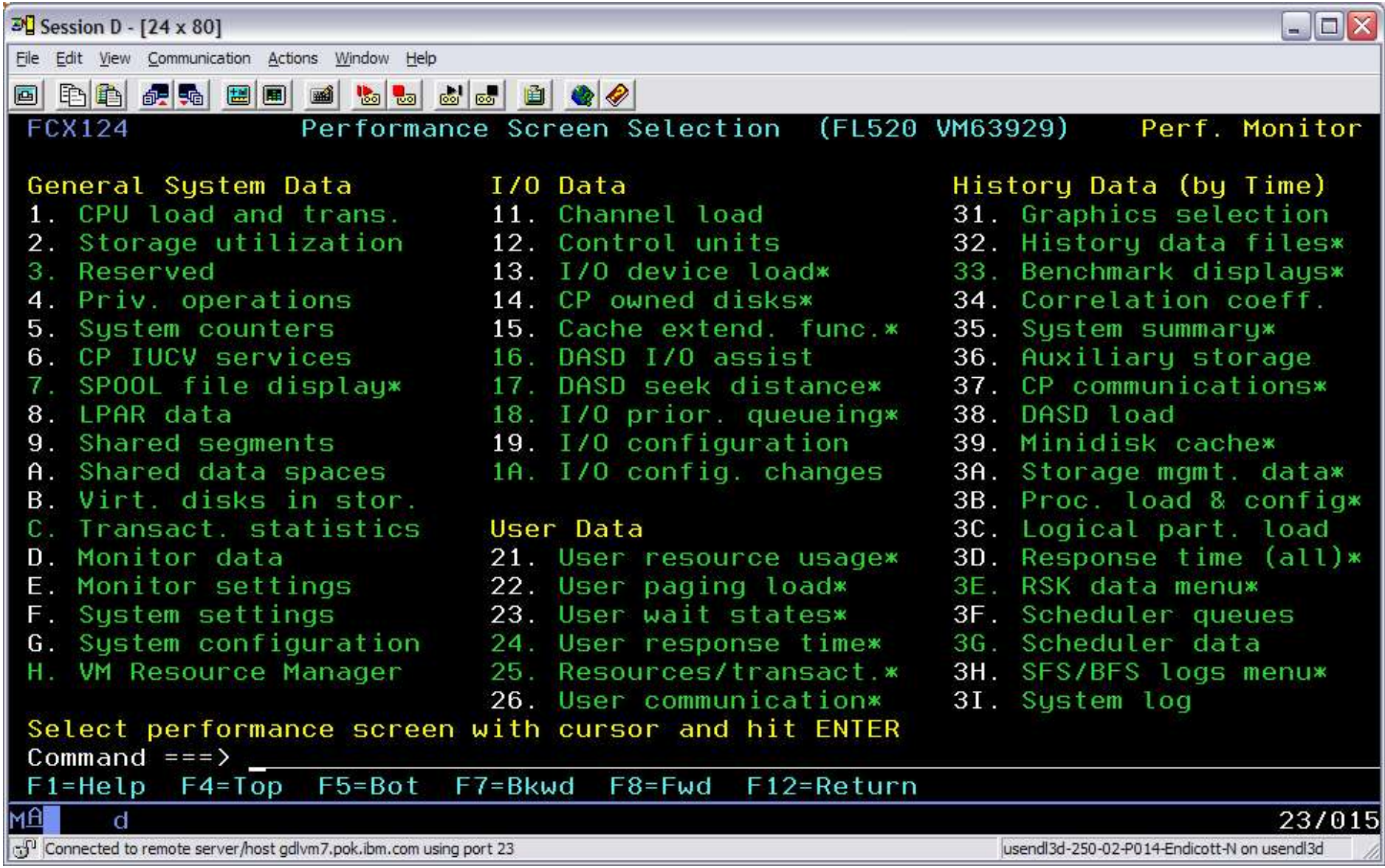
Time Periods

- Most data based off of monitor data
  - Sample Interval – default of 1 minute
  - Sample Rate – default of 2 seconds high frequency sampling rate
  - Controlled by **CP MONITOR** command
- Toolkit Related time frames
  - CURRENT – most recent monitor interval
  - AVERAGE – average overall reporting period
  - BYTIME – data rows for each monitor interval or as set
  - INTERIM – multiple reports for each interim period as set
  - SUMMARY – summary period for historic recording
  - TREND – large granularity for historic recording
  - Controlled by Performance Toolkit **FC MONCOLL RESET** command

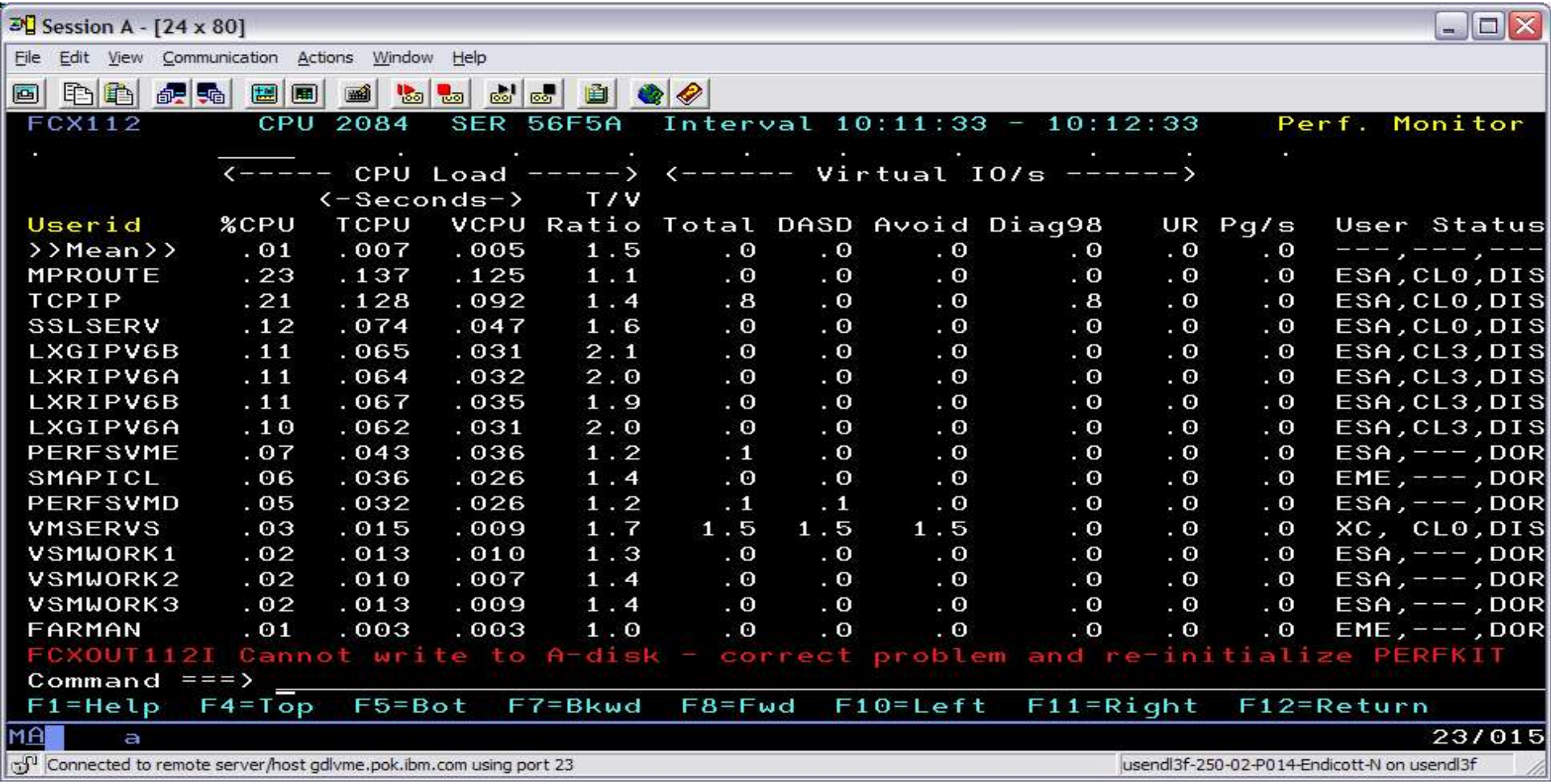
Basic Mode - Operator's console



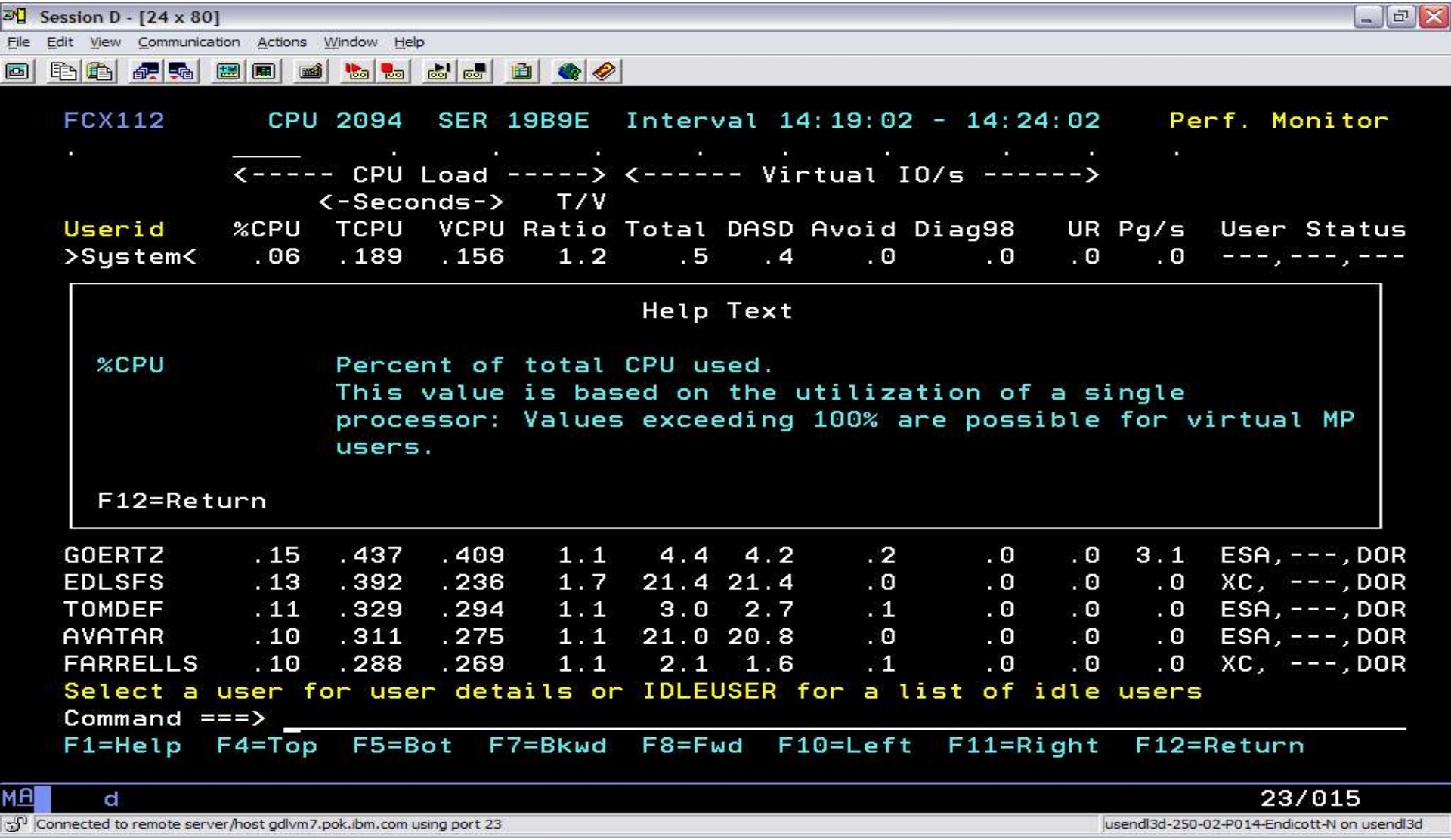
Performance Monitoring



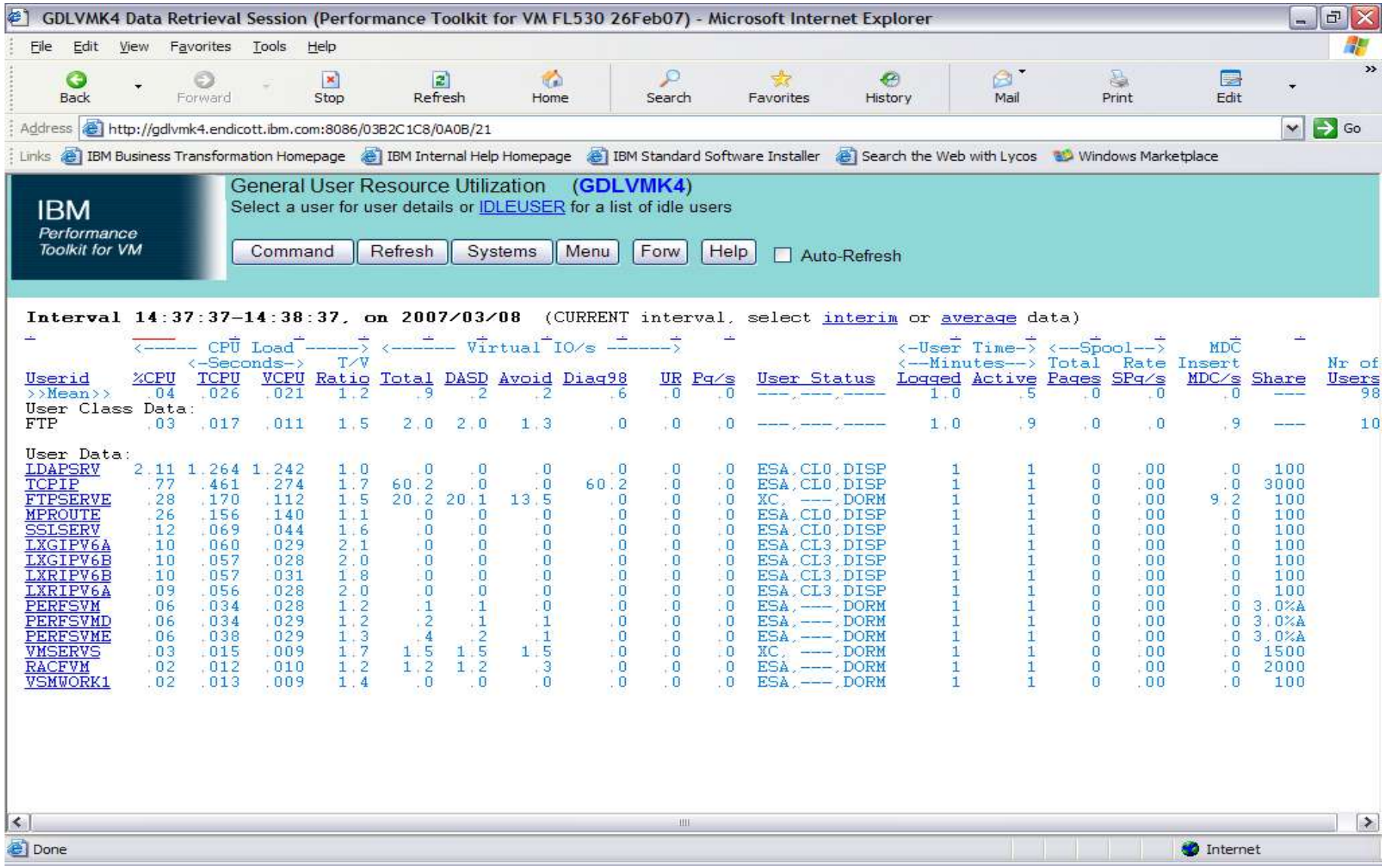
Performance Monitoring – USER Display



Context Sensitive Help

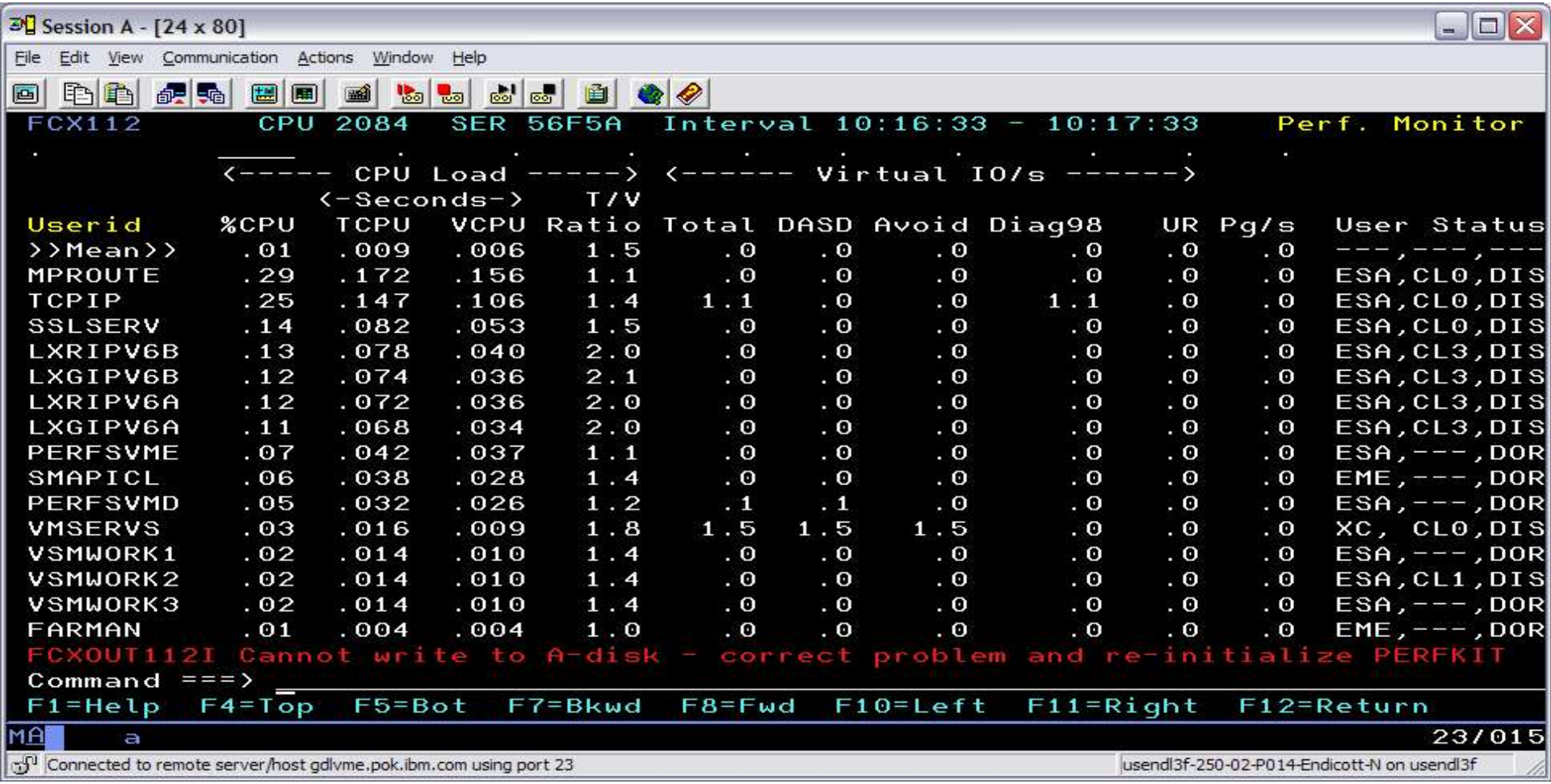


FC UCLASS FTP* FTP

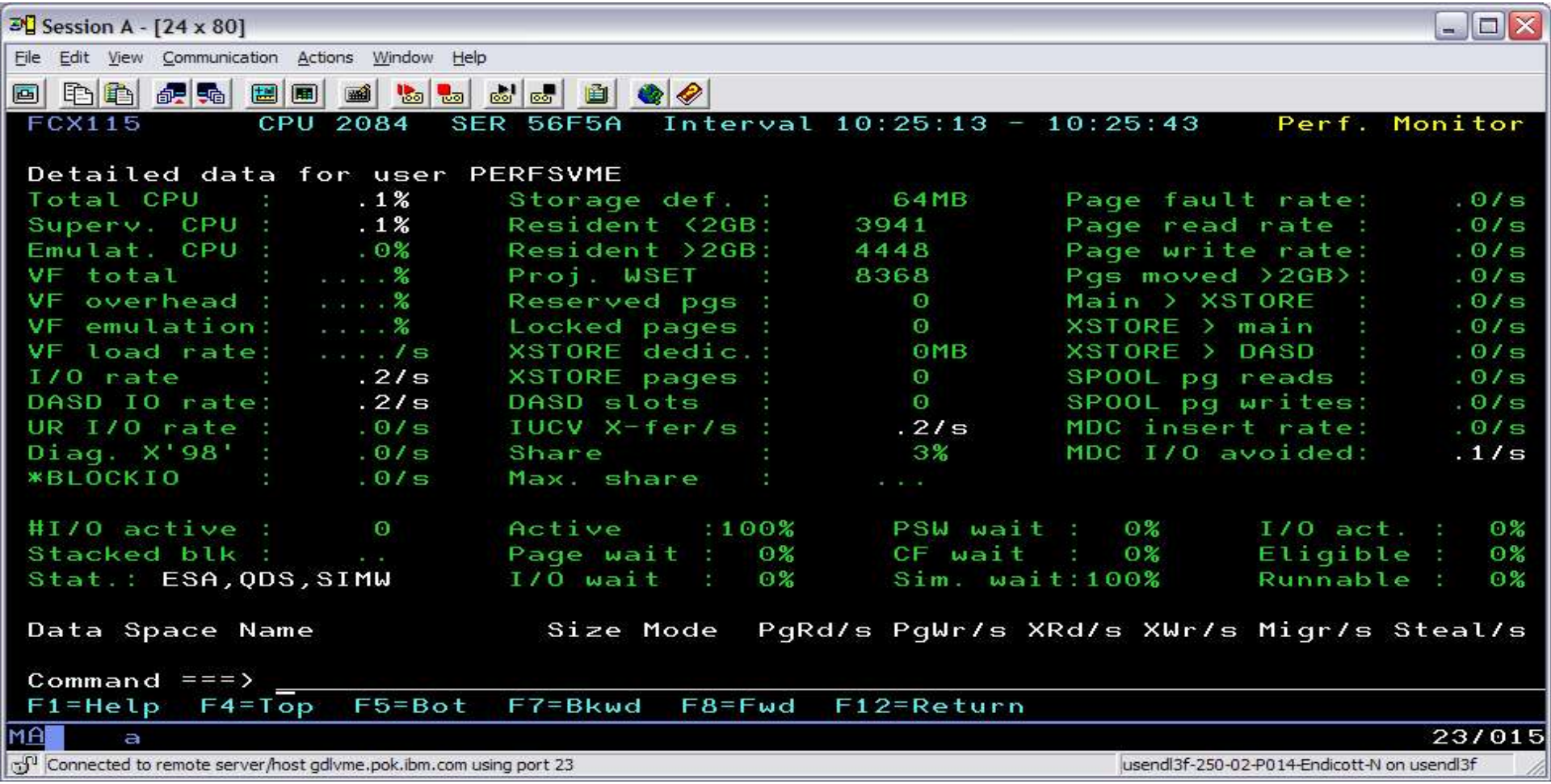


Userid	%CPU	TCPU	VCPU	T/V Ratio	Total	DASD	Avoid	Diag98	UR	Pg/s	User Status	Logged	Active	Total Pages	Rate SPg/s	MDC Insert MDC/s	Share	Nr of Users
>>Mean>>	.04	.026	.021	1.2	.9	.2	.2	.6	.0	.0	---,---,----	1.0	.5	.0	.0	.0	---	98
User Class Data:																		
FTP	.03	.017	.011	1.5	2.0	2.0	1.3	.0	.0	.0	---,---,----	1.0	.9	.0	.0	.9	---	10
User Data:																		
LDAPSRV	2.11	1.264	1.242	1.0	.0	.0	.0	.0	.0	.0	ESA,CL0,DISP	1	1	0	.00	.0	100	
TCPIP	.77	.461	.274	1.7	60.2	.0	.0	60.2	.0	.0	ESA,CL0,DISP	1	1	0	.00	.0	3000	
FTPSERVE	.28	.170	.112	1.5	20.2	20.1	13.5	.0	.0	.0	XC, ---,DORM	1	1	0	.00	9.2	100	
MPROUTE	.26	.156	.140	1.1	.0	.0	.0	.0	.0	.0	ESA,CL0,DISP	1	1	0	.00	.0	100	
SSLSERV	.12	.069	.044	1.6	.0	.0	.0	.0	.0	.0	ESA,CL0,DISP	1	1	0	.00	.0	100	
LXGIPV6A	.10	.060	.029	2.1	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0	.00	.0	100	
LXGIPV6B	.10	.057	.028	2.0	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0	.00	.0	100	
LXRIPV6B	.10	.057	.031	1.8	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0	.00	.0	100	
LXRIPV6A	.09	.056	.028	2.0	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0	.00	.0	100	
PERFSVM	.06	.034	.028	1.2	.1	.1	.0	.0	.0	.0	ESA,---,DORM	1	1	0	.00	.0	3.0%A	
PERFSVMD	.06	.034	.029	1.2	.2	.1	.1	.0	.0	.0	ESA,---,DORM	1	1	0	.00	.0	3.0%A	
PERFSVME	.06	.038	.029	1.3	.4	.2	.1	.0	.0	.0	ESA,---,DORM	1	1	0	.00	.0	3.0%A	
VMSERVS	.03	.015	.009	1.7	1.5	1.5	1.5	.0	.0	.0	XC, ---,DORM	1	1	0	.00	.0	1500	
RACFVM	.02	.012	.010	1.2	1.2	1.2	.3	.0	.0	.0	ESA,---,DORM	1	1	0	.00	.0	2000	
VSMWORK1	.02	.013	.009	1.4	.0	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0	.00	.0	100	

Back to USER screen

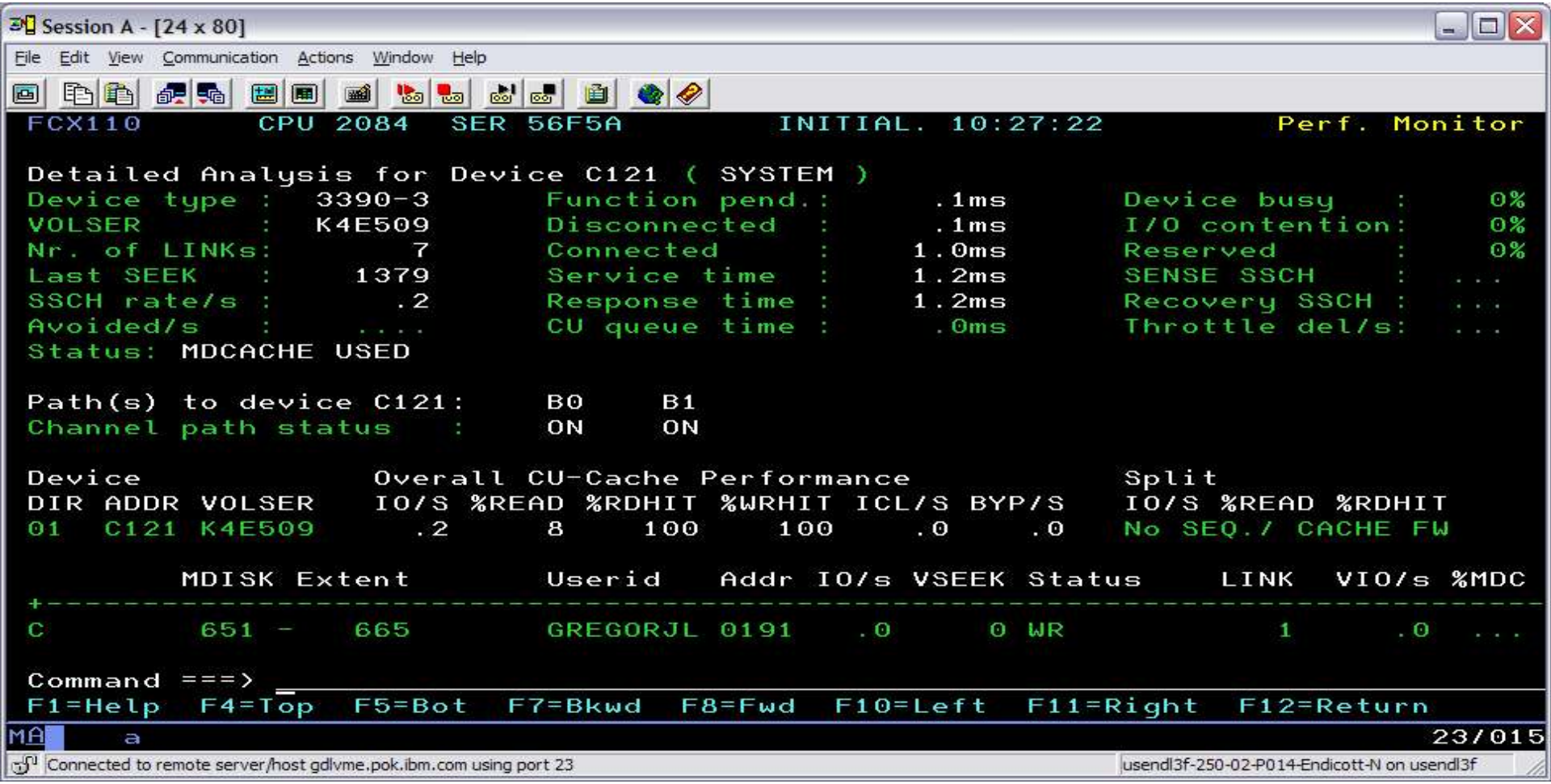


USER Details

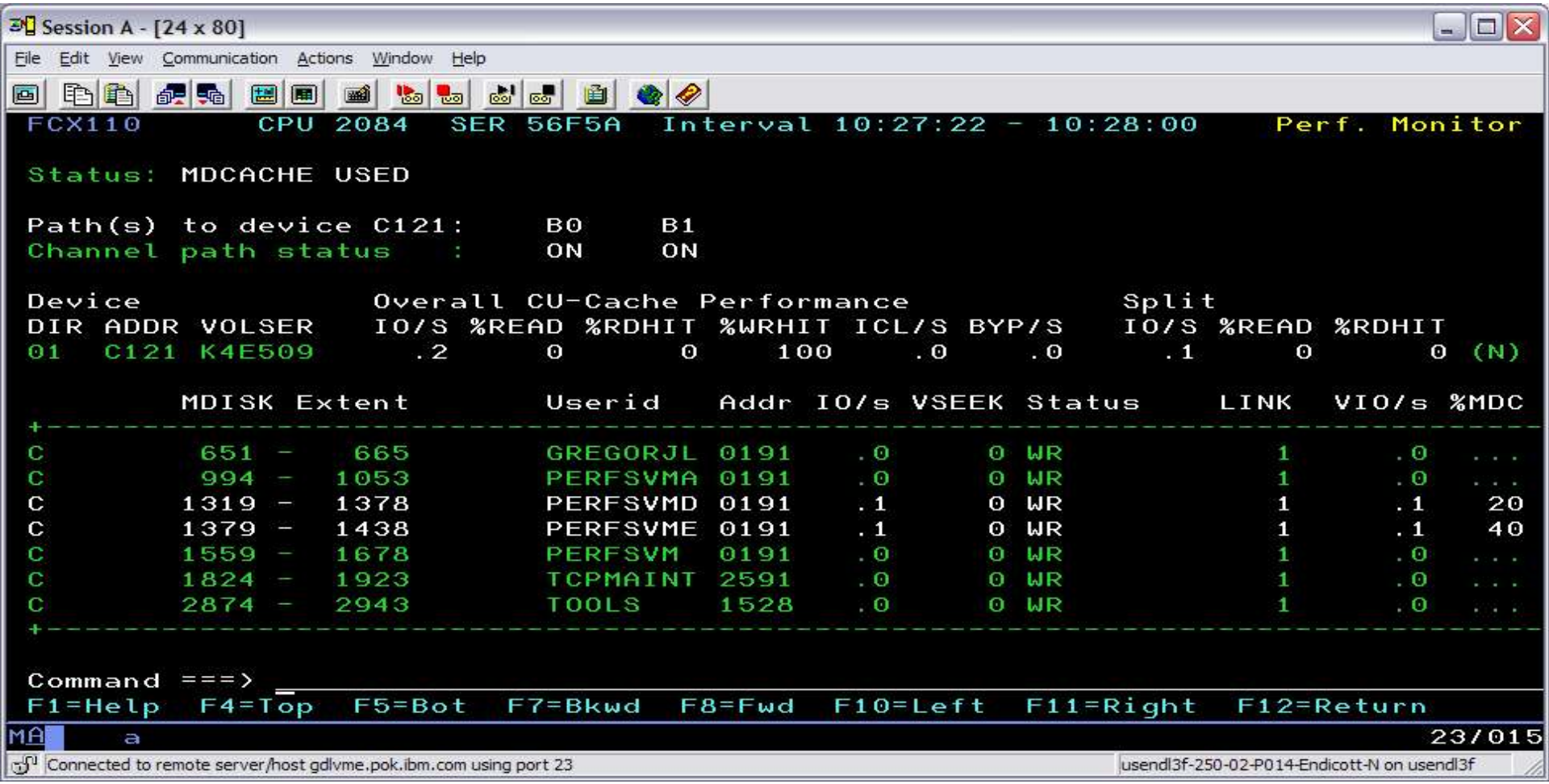


USER Details – page 2

Device Details



Device Details – page 2



Benchmarking

- More closely monitor users and/or I/O devices
- Log-type displays on a “by-time” basis
- Started with FCONTROL BENCHMARK command

USERLOG userid

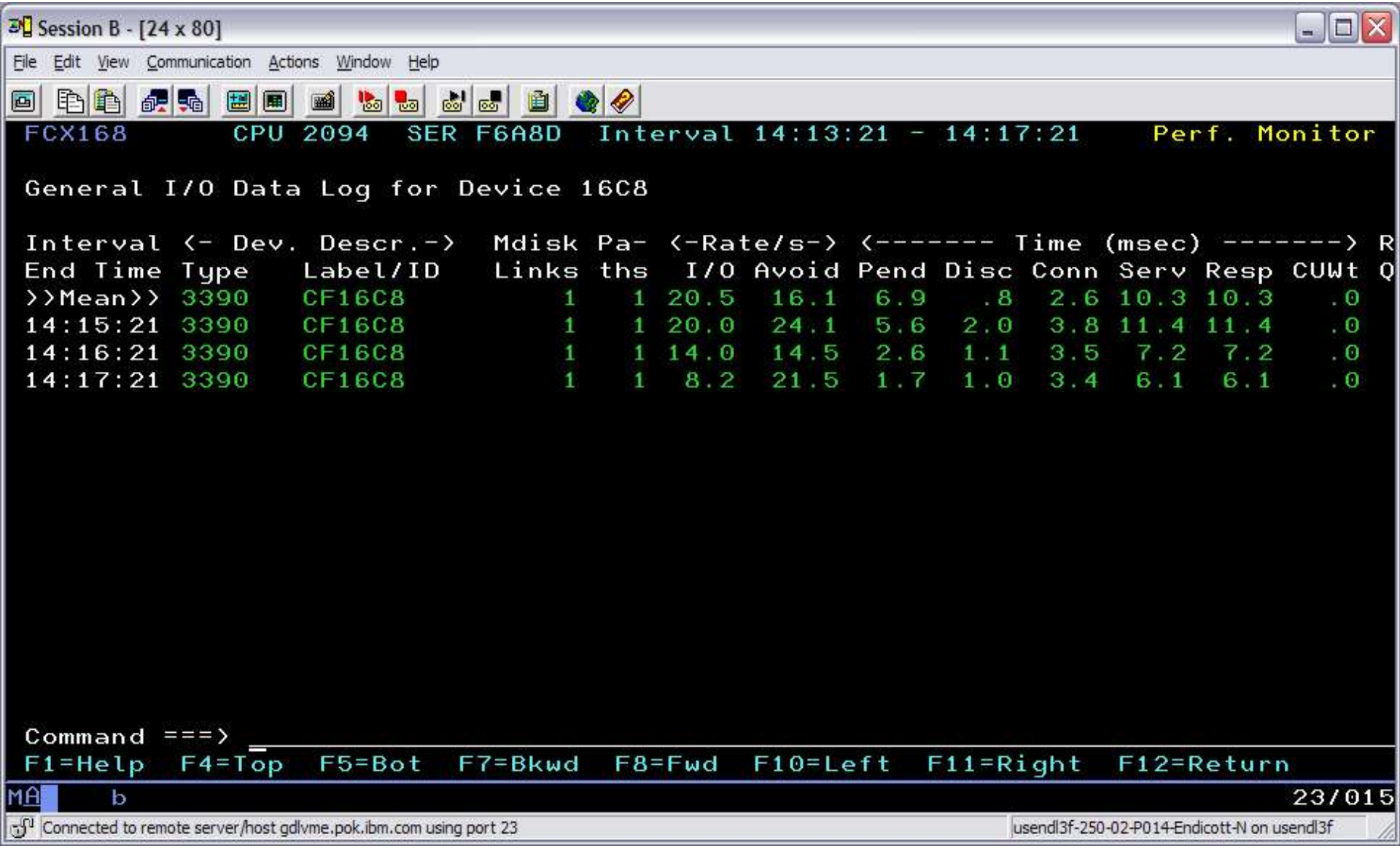
Session B - [24 x 80]

File Edit View Communication Actions Window Help

```
FCX162       CPU 2094  SER F6A8D  Interval 13:39:20 - 13:49:20     Perf. Monitor

Resource Usage Log for User LX00001

          <----- CPU Load -----> <------ Virtual IO/s ------>
Interval        <-Seconds->   T/V
End Time  %CPU   TCPU   VCPU Ratio Total DASD Avoid Diag98   UR Pg/s  User Status
>>Mean>>  26.0 93.21 59.10   1.6    .5   .5    .4     .0   .0  2.9  ---,---,---
13:41:20  28.2 16.92 10.44   1.6    .6   .5    .6     .0   .0 11.4  EME,CL0,DIS
13:42:20  25.6 15.33 9.795   1.6    .5   .5    .6     .0   .0  2.3  EME,CL0,DIS
13:43:20  25.4 15.27 9.783   1.6    .5   .4    .4     .0   .0  3.4  EME,CL0,DIS
13:44:20  26.1 15.63 10.01   1.6    .5   .5    .5     .0   .0   .3  EME,CL0,DIS
13:45:20       User logged off
13:46:20       User logged off
13:47:20       User logged off
13:48:20       User logged off
13:49:20       User logged off



Command ===>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F10=Left  F11=Right  F12=Return
MA    b                                                          23/015
```

Connected to remote server/host gdlvme.pok.ibm.com using port 23 — usendl3f-250-02-P014-Endicott-N on usendl3f

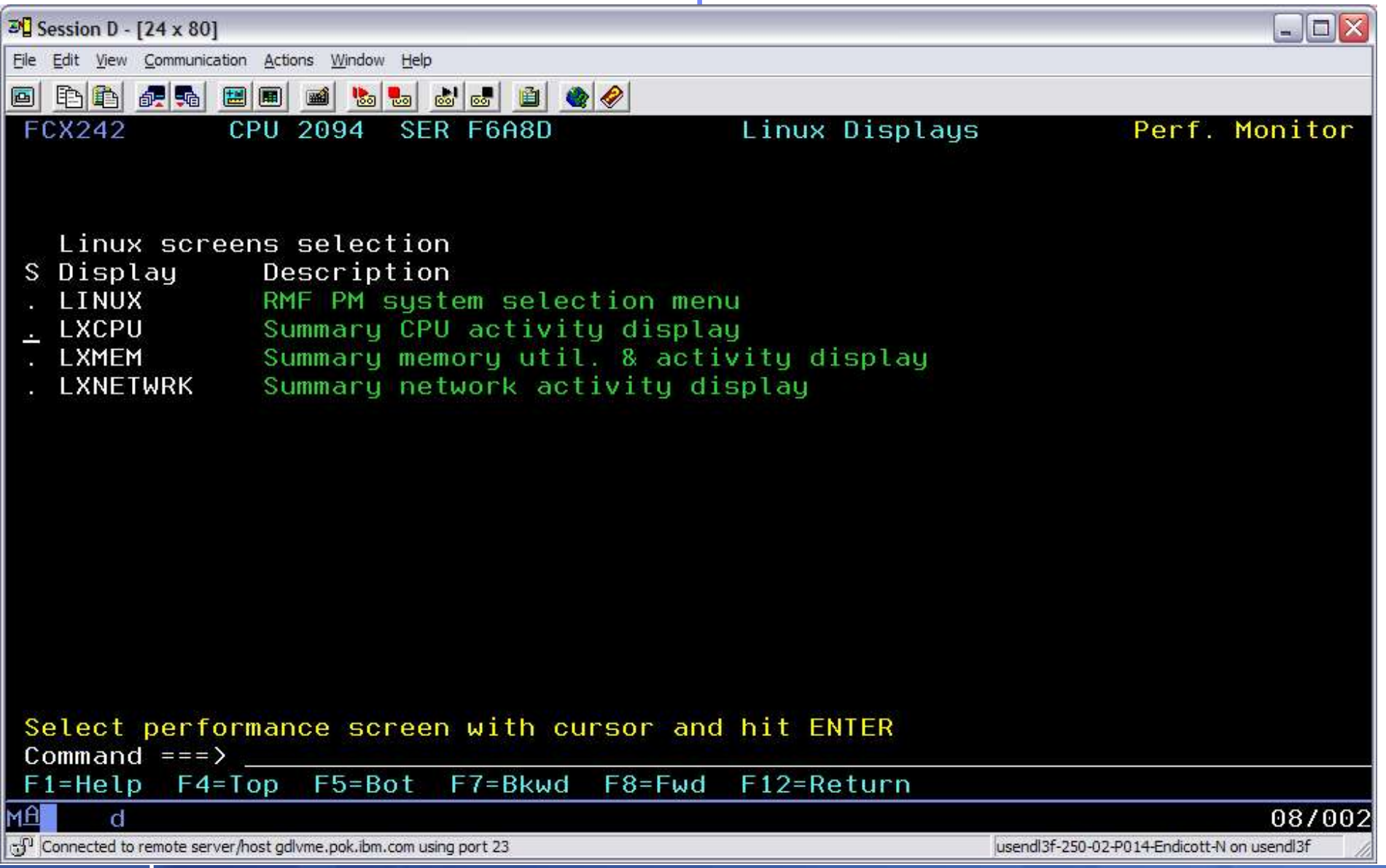
DEVLOG devno



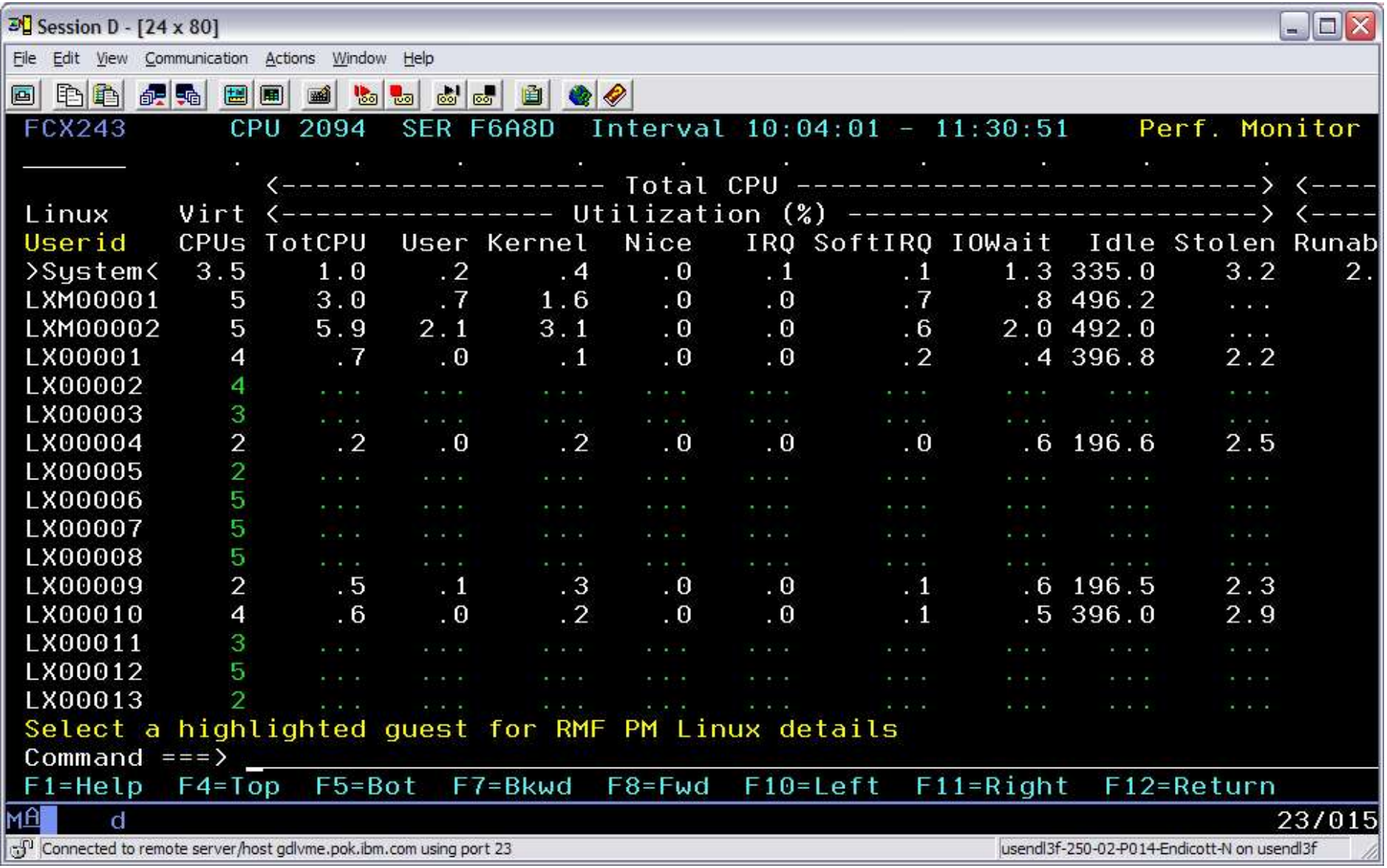
Monitoring Linux Guests

- Through Linux APPLDATA support, you can monitor
  - Summary CPU use
  - Summary memory use
  - Summary network use
  - Data is CP monitor data, so it can be saved and viewed again
- Through the Linux RMF PM, you can monitor
  - More detailed Linux internal metrics
  - Data is not saved by Performance Toolkit

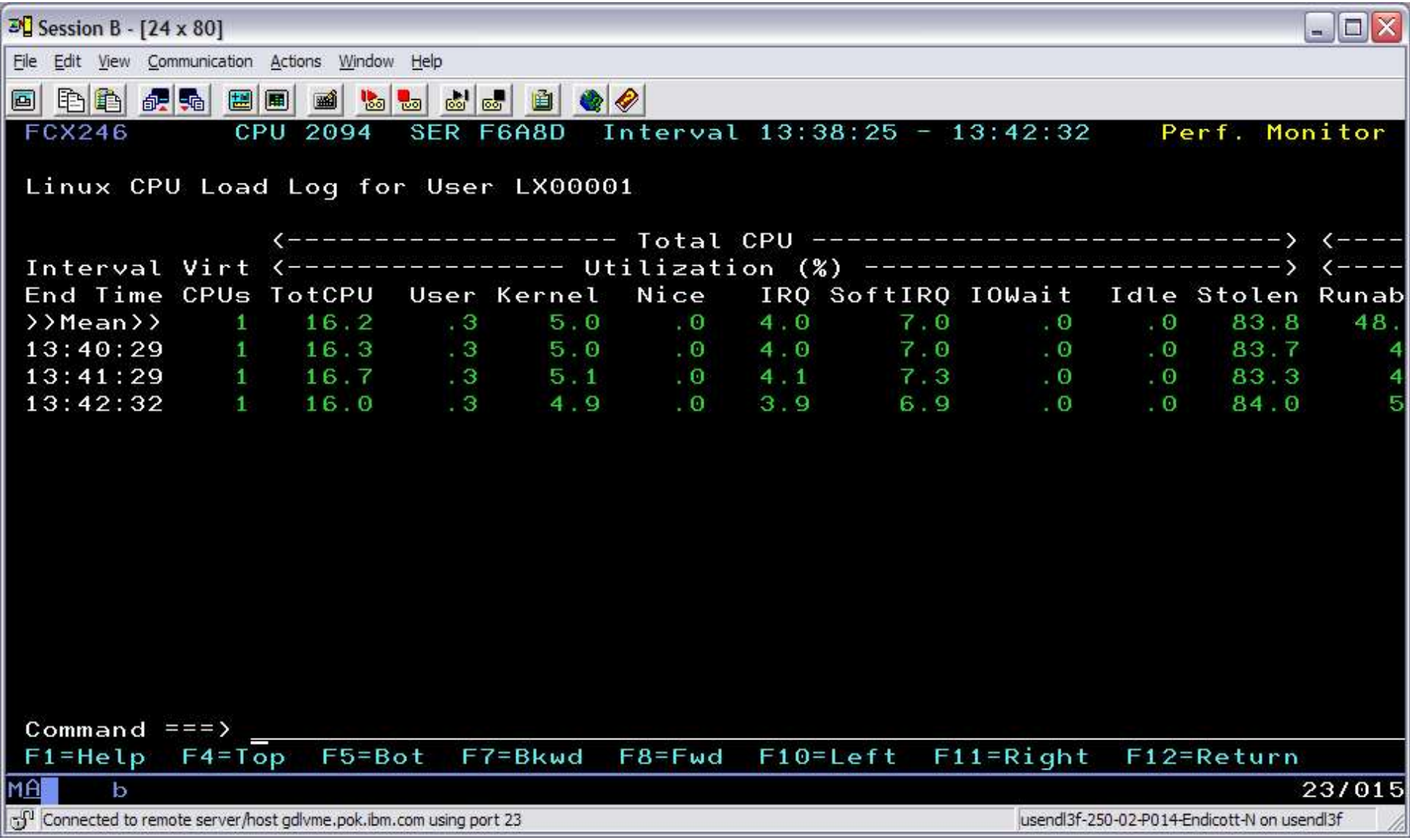
LINUX Selection Screen – Option 29



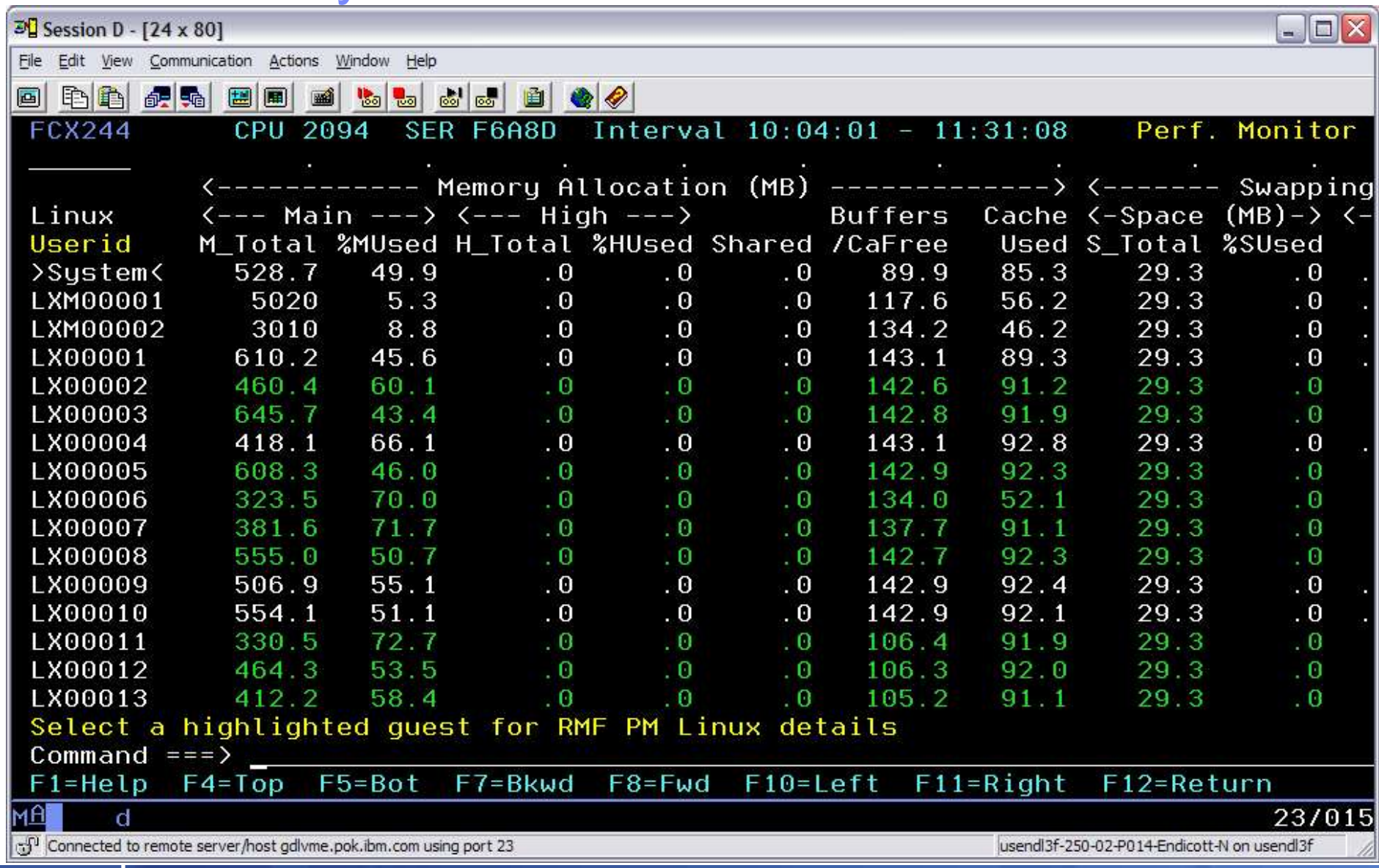
LINUX CPU Screen



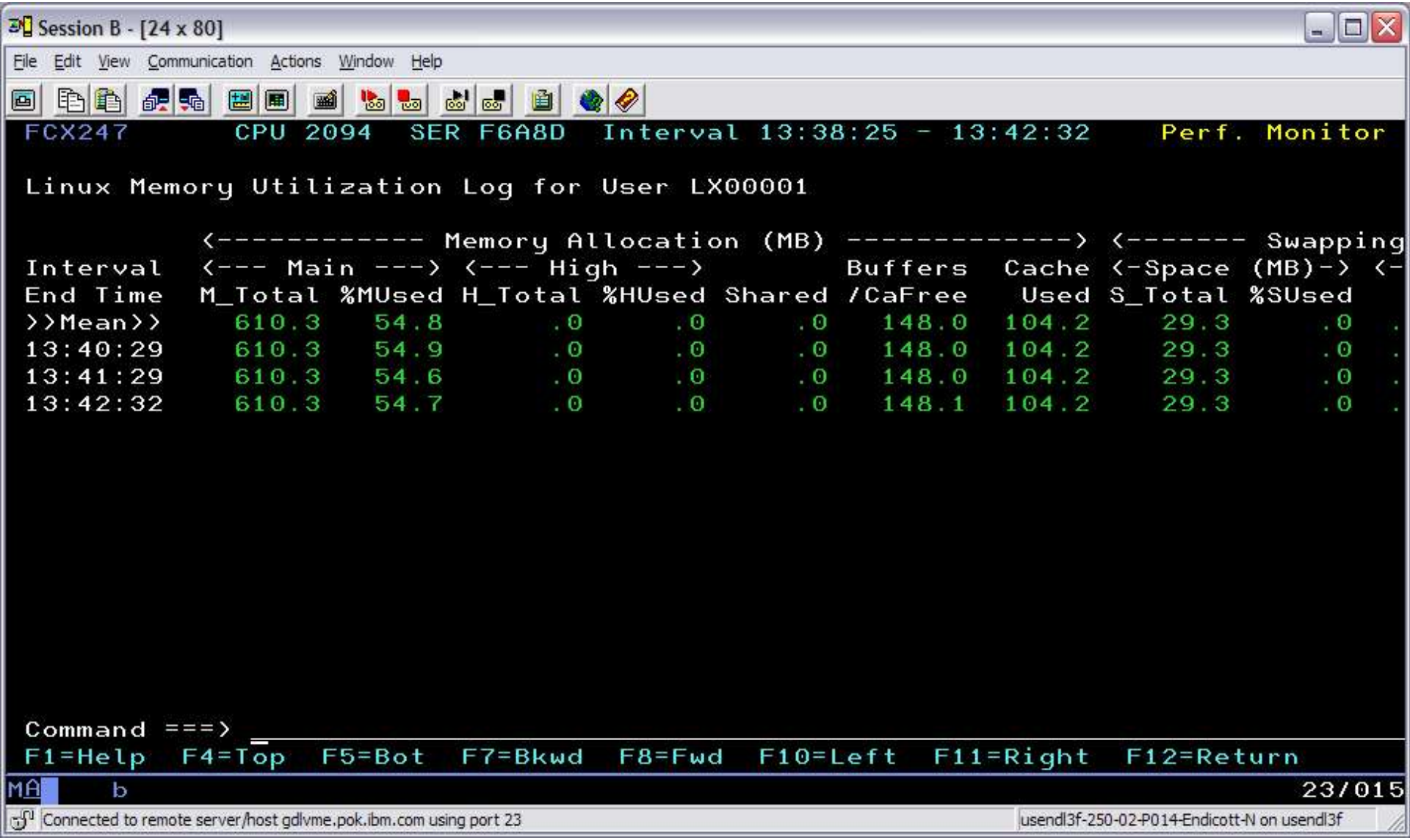
LXCPU LOG userid Screen



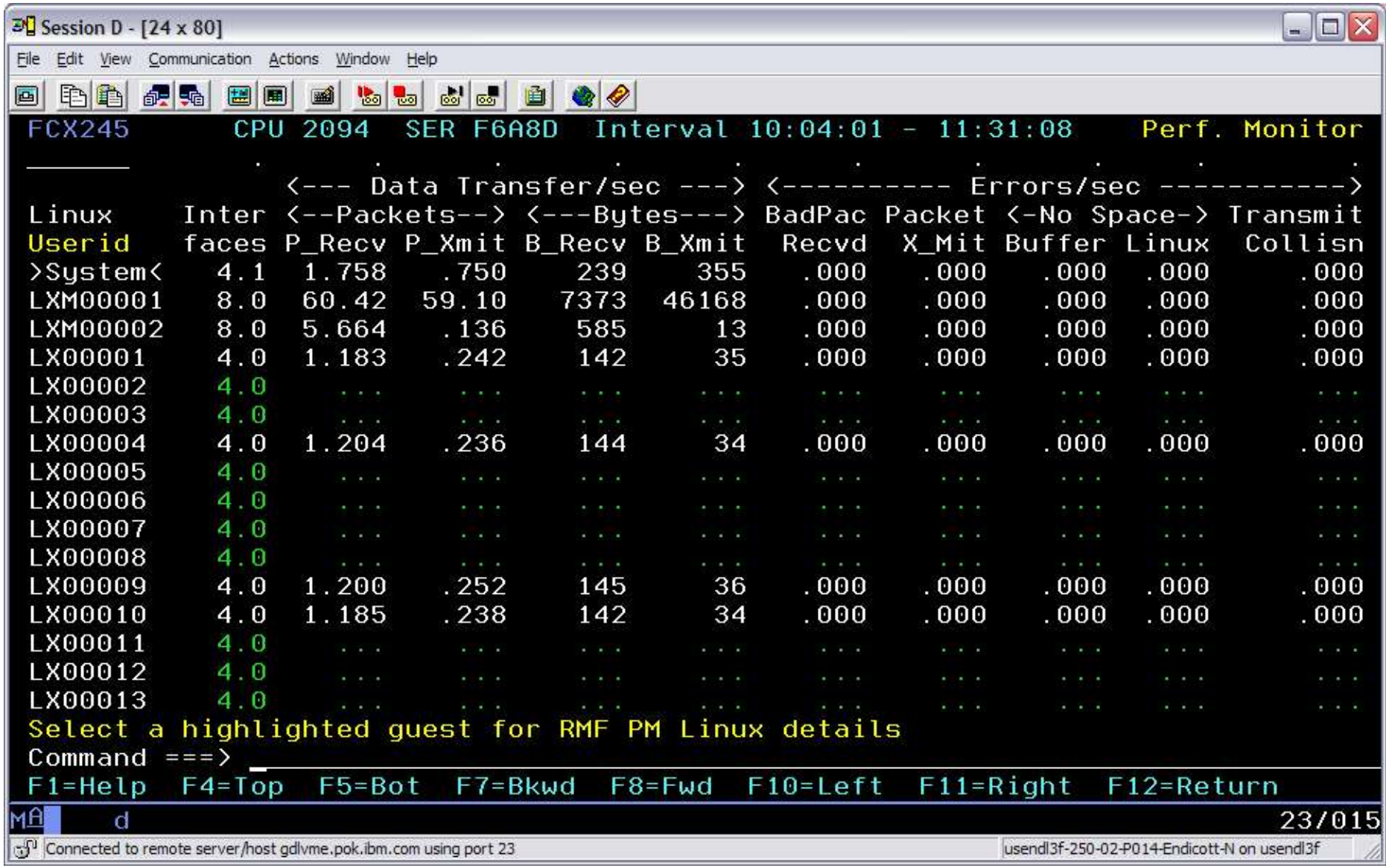
LINUX MEMory Screen



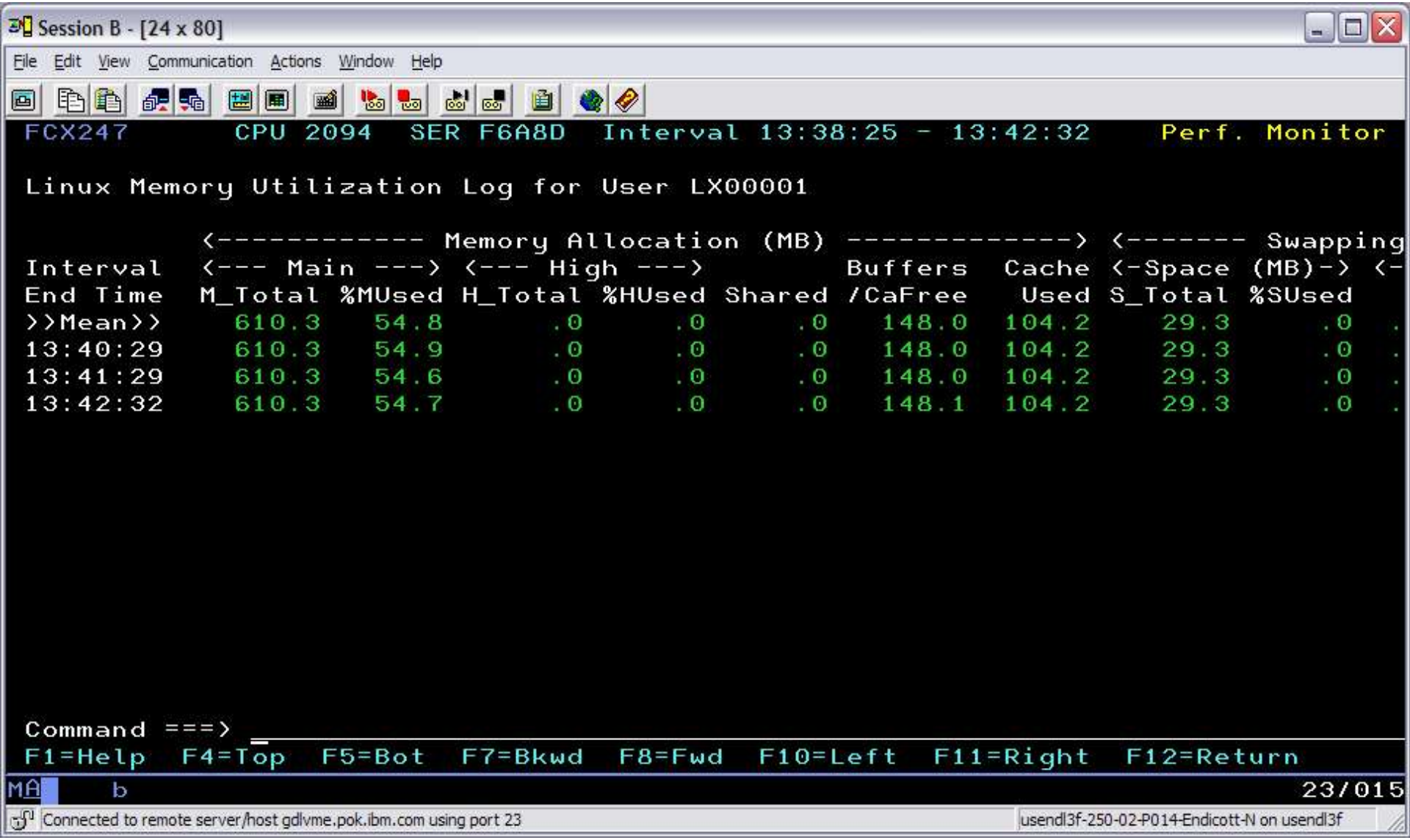
LINUX MEMory LOG Screen



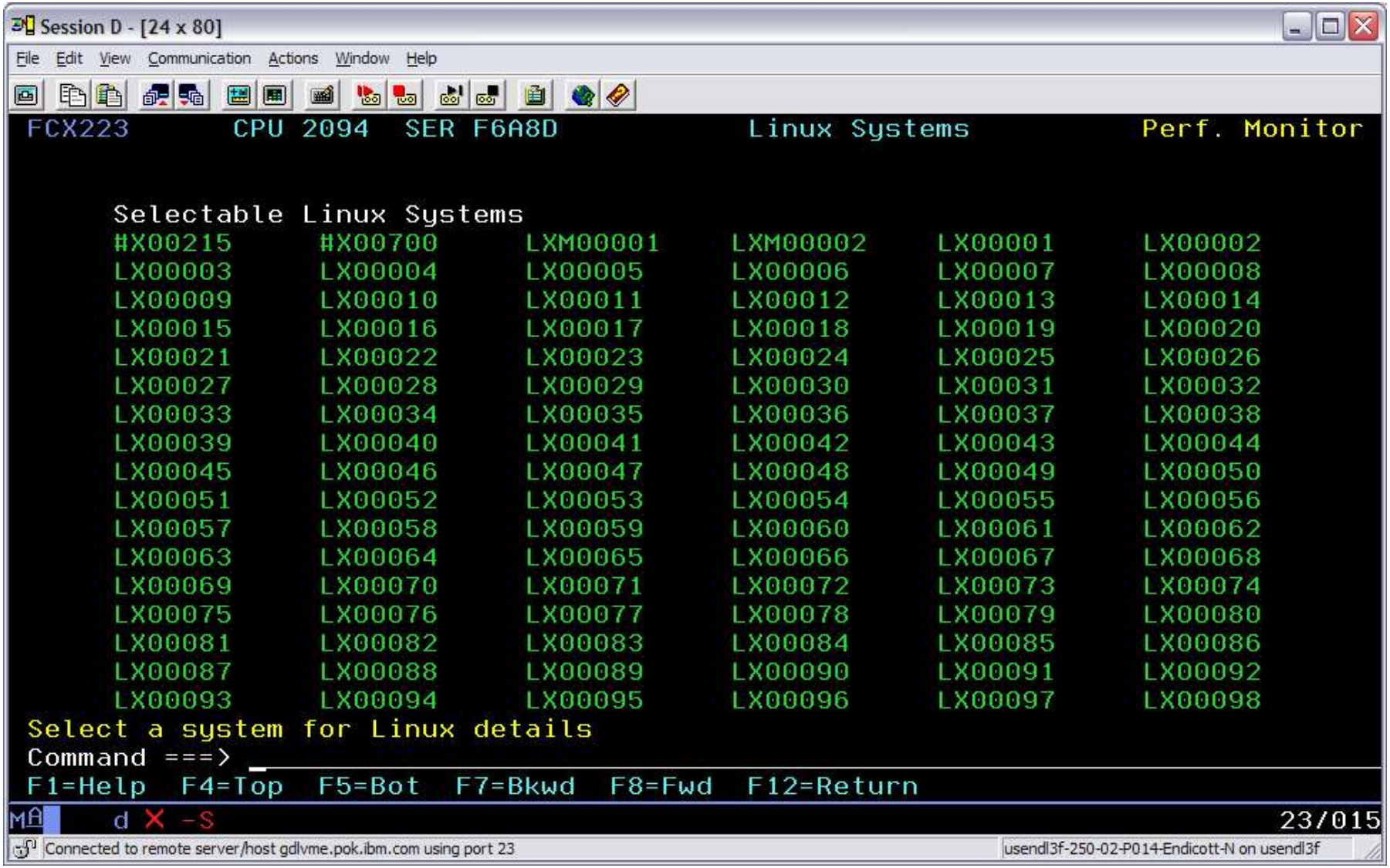
LINUX NETWRK Screen



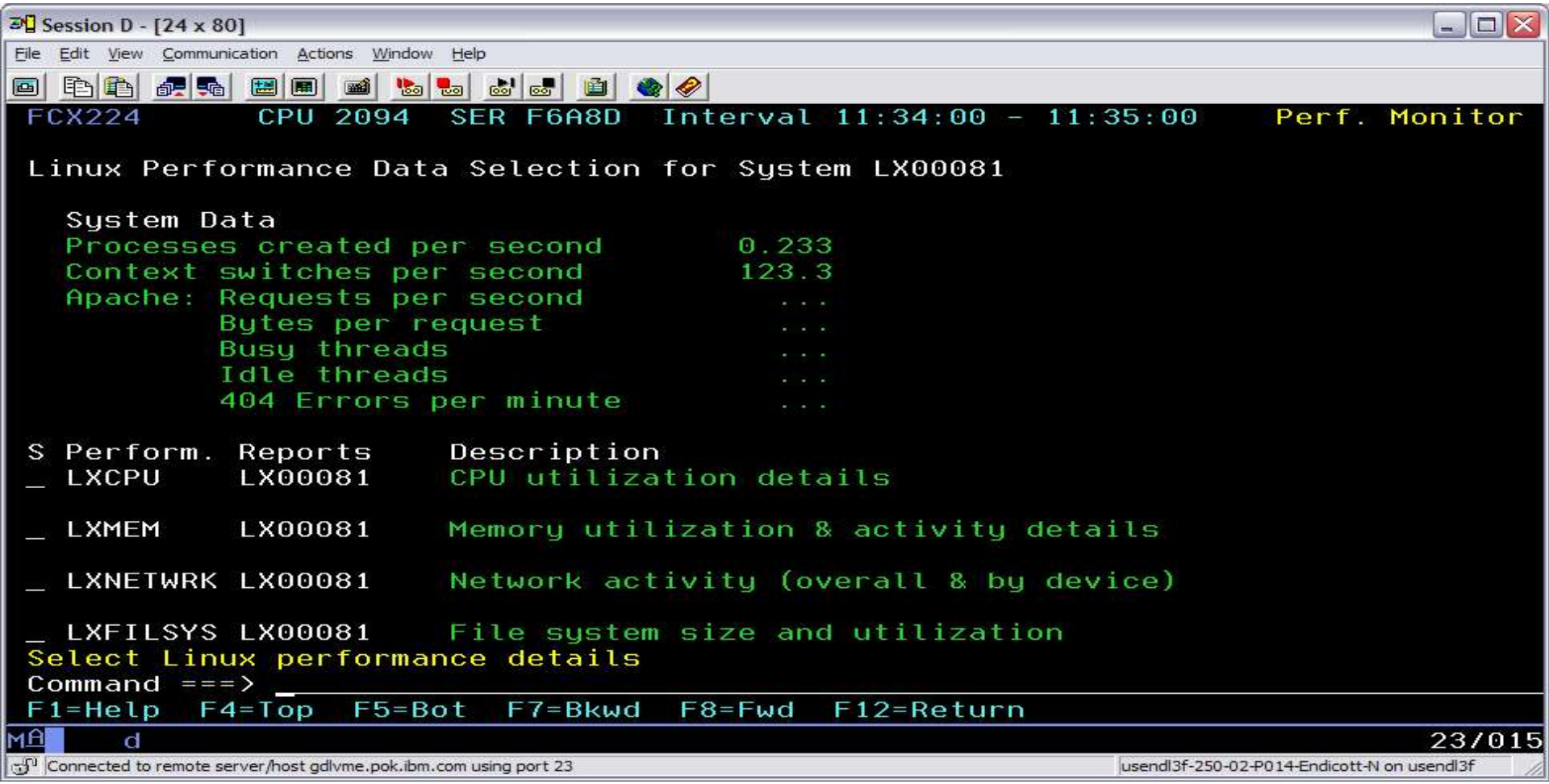
LXNETLOG Screen



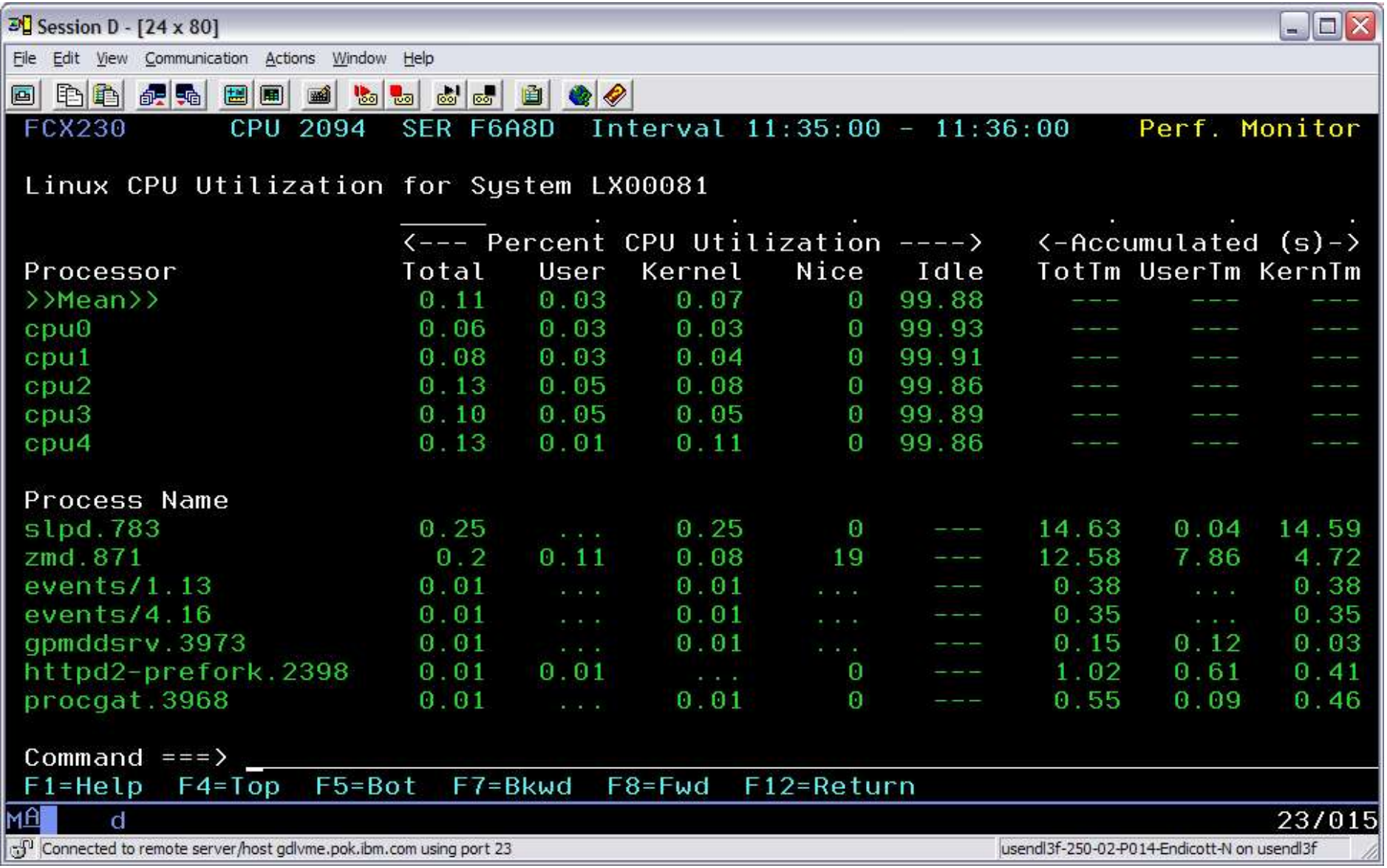
LINUX RMF Selection Screen



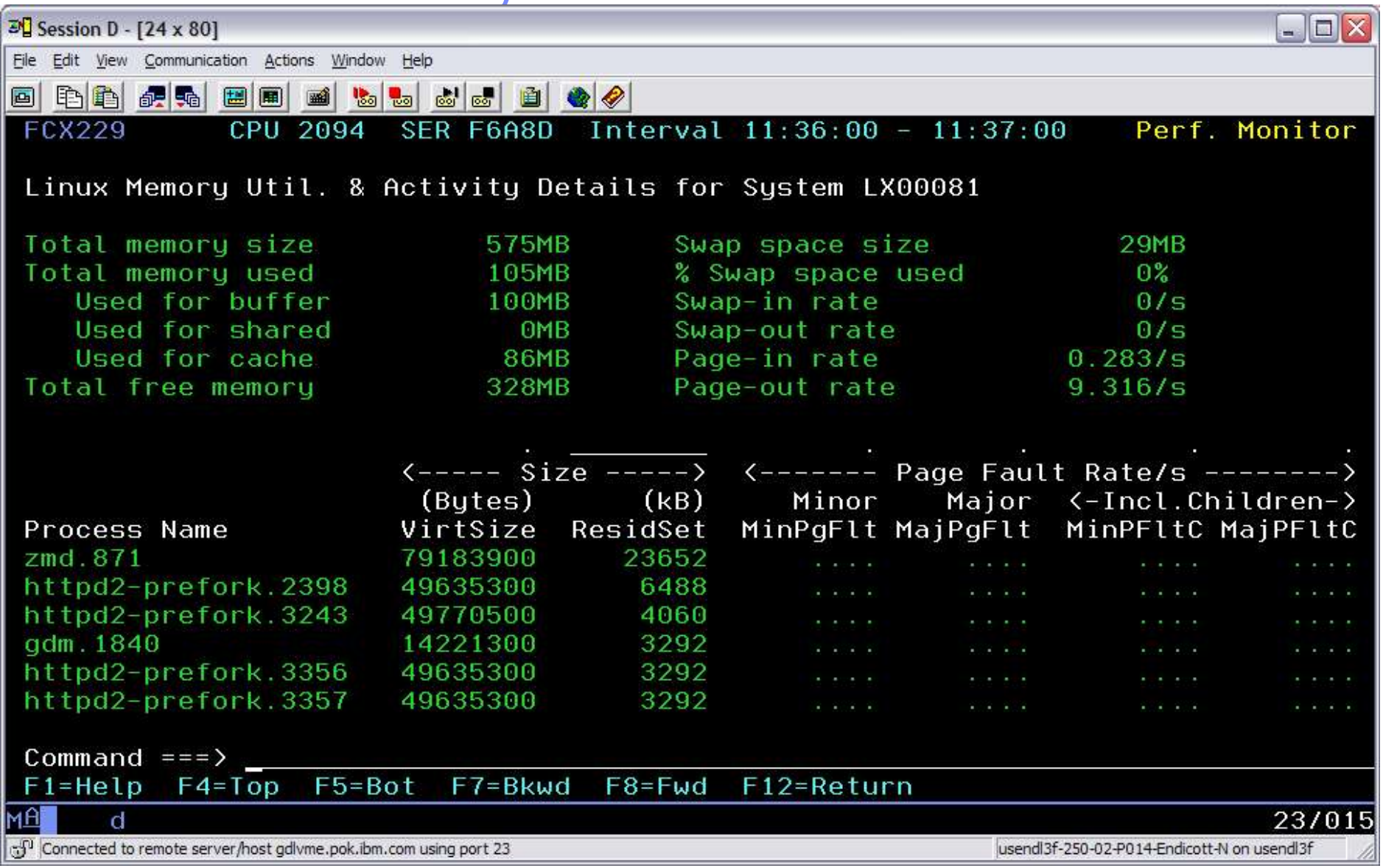
LINUX RMF Selection Screen



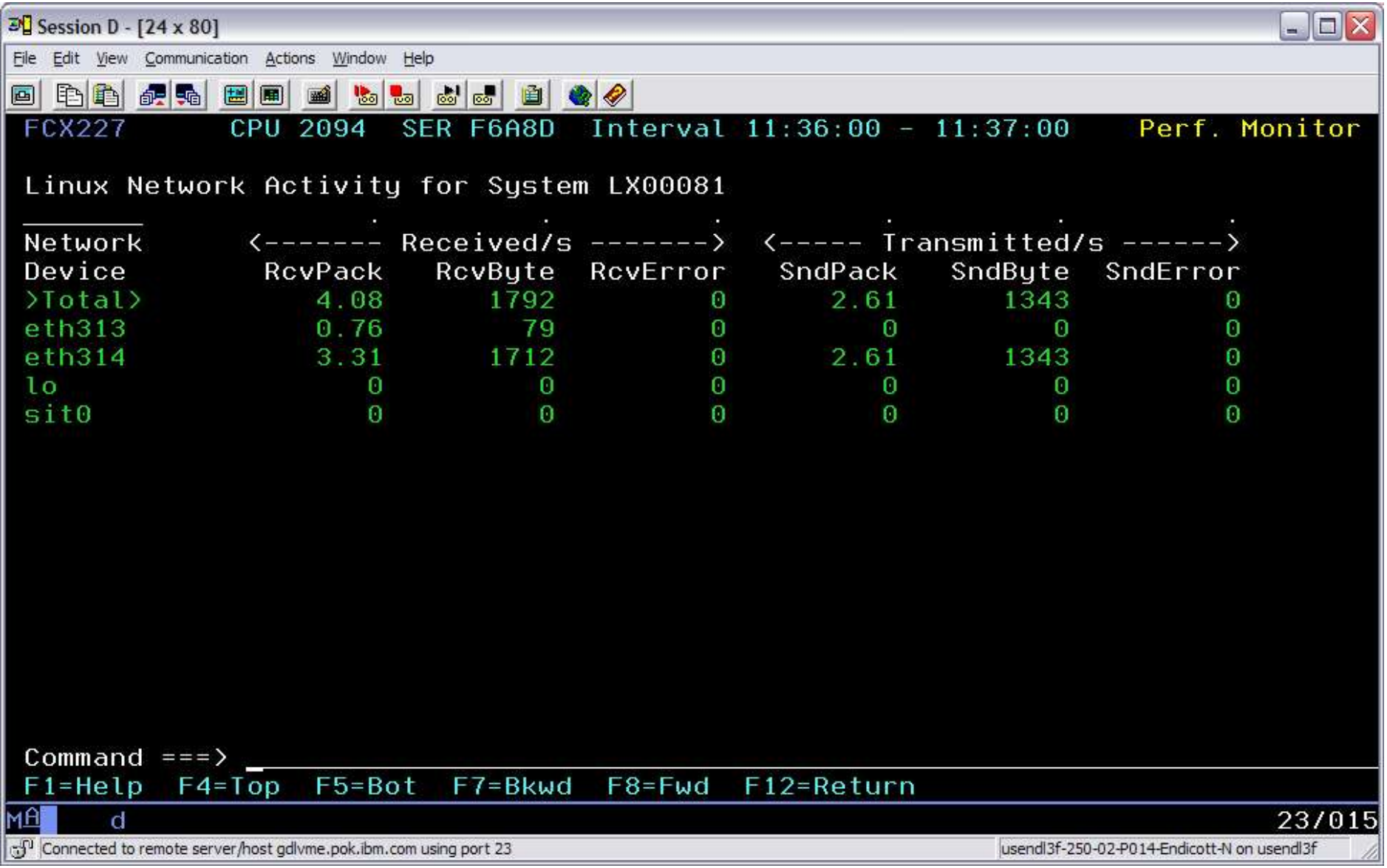
LINUX RMF CPU Screen



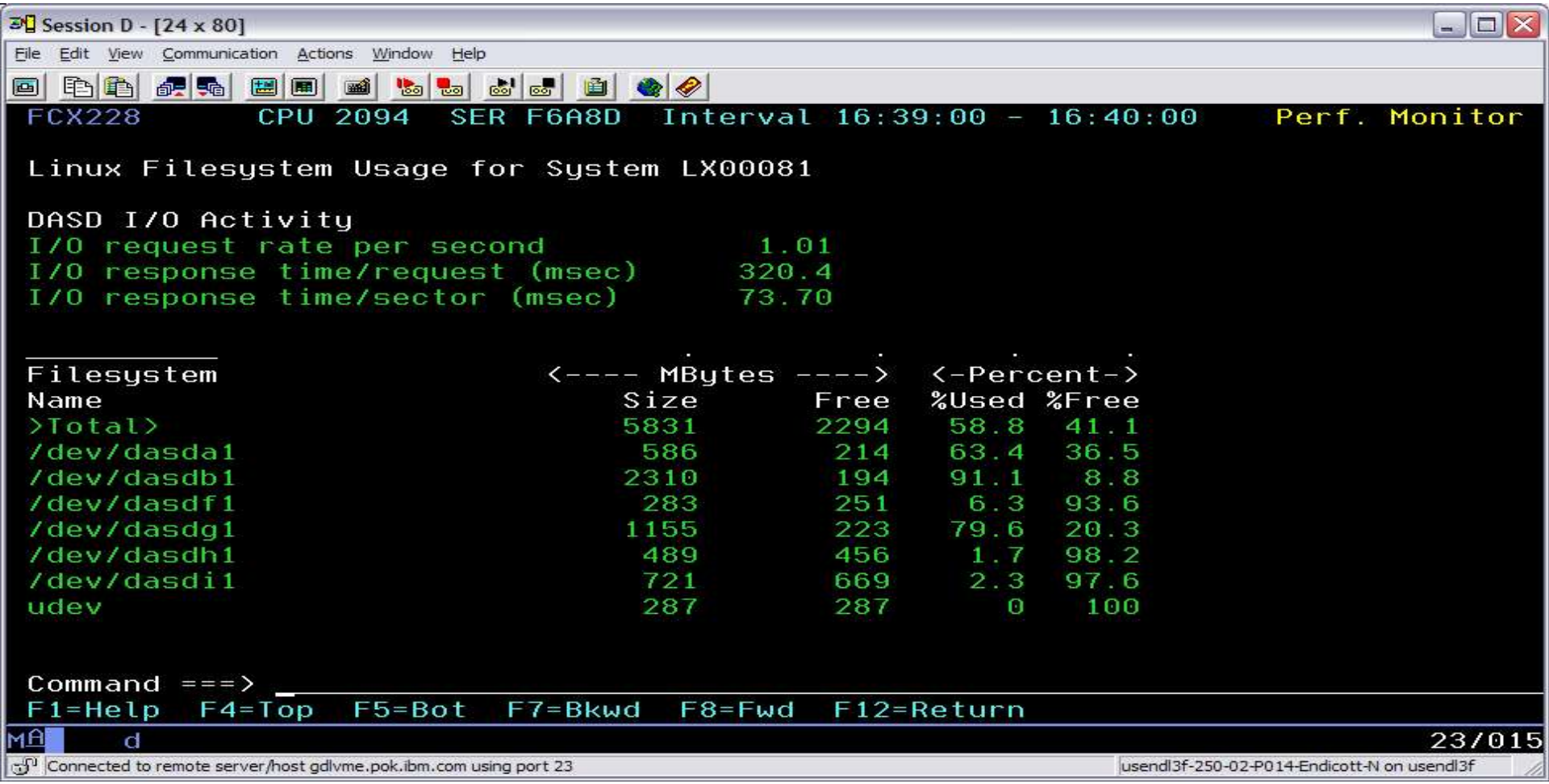
LINUX RMF Memory Screen



LINUX RMF Network Screen



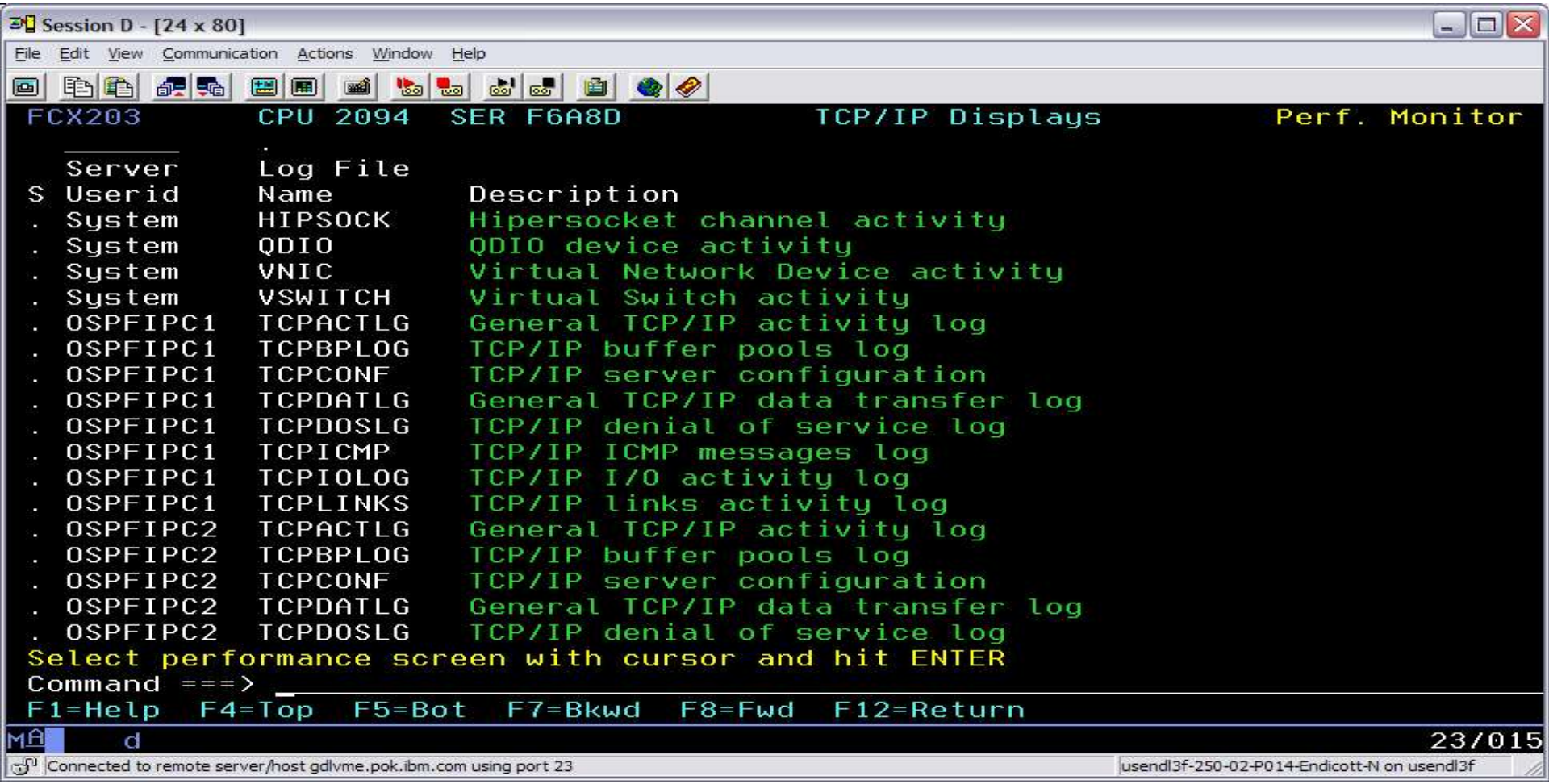
LINUX RMF Filesys Screen



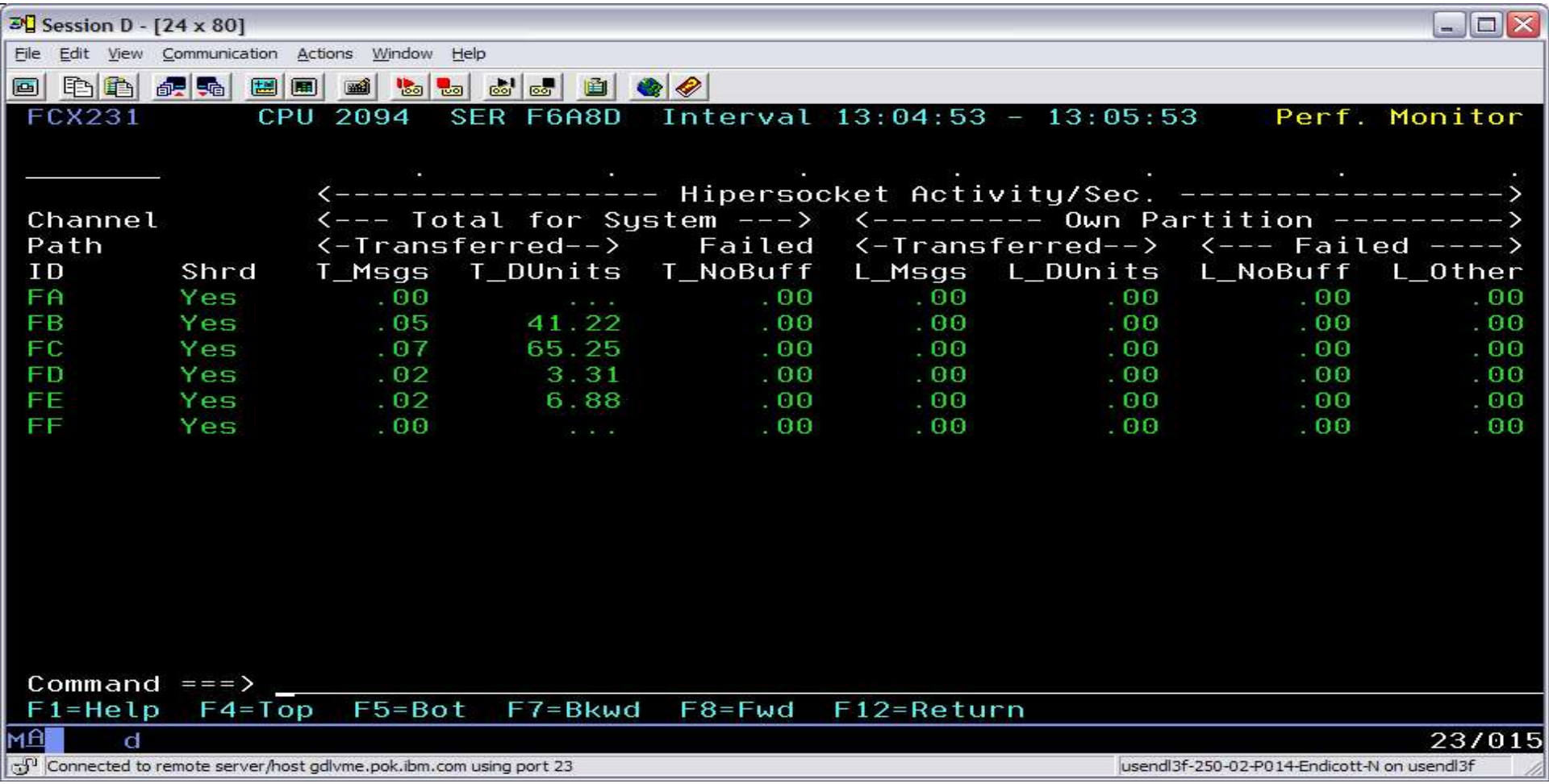
Monitoring TCP/IP Stacks

- Track activity across the TCP/IP servers
- Track device activity associated with TCP/IP

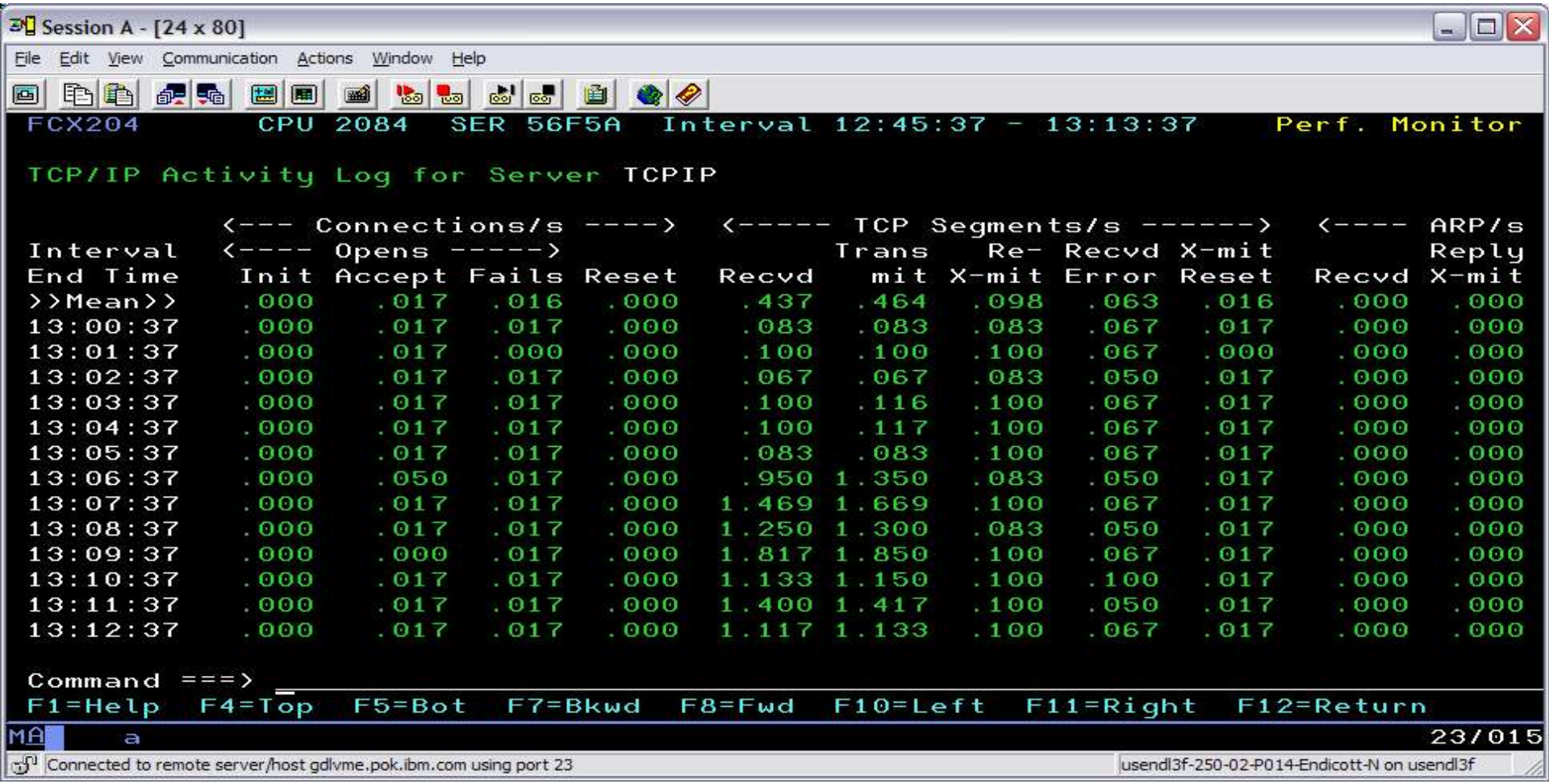
TCPIP Menu – Option 3K



HIPSOCK



TCPACTLG – TCPIP Activity Log



TCPBPLOG – TCPIP Buffer Pool Mgmt Log

Session A - [24 x 80]

File Edit View Communication Actions Window Help

FCX210 CPU 2084 SER 56F5A Interval 12:45:37 - 13:13:37 Perf. Monitor

TCP/IP Buffer Pool Management Log for Server TCPIP

	<---------- Buffer Pool Level ----------											
	Acti	Cli-	<- Enve- ->		Raw	Sock	BSD	TCP	UDP			Segm
Interval	vity	ent	<- lope -->		IP	et	Sock	Ctl	Ctl	<-Data Buffer-->		Ackn
End Time	CBlk	CBlk	Reglr	Large	CBlk	CBlk	CBlk	Blok	Blok	Reglr	Small	Tiny	CBlk
>>Mean>>	984	83	748	139	48	903	948	2962	68	8964	494	8	60k
>>Min.>>	471	83	335	99	48	647	945	2705	67	8447	481	7	60k
13:03:37	978	83	747	134	48	903	948	2963	68	8963	495	8	60k
13:04:37	979	83	745	135	48	903	948	2963	68	8963	495	8	60k
13:05:37	978	83	749	134	48	903	948	2963	68	8963	495	8	60k
13:06:37	975	83	749	130	48	903	948	2961	68	8963	493	8	60k
13:07:37	976	83	749	132	48	903	948	2961	68	8963	493	8	60k
13:08:37	980	83	747	136	48	903	948	2961	68	8963	493	8	60k
13:09:37	982	83	749	137	48	903	948	2961	68	8964	493	8	60k
13:10:37	980	83	745	135	48	903	948	2961	68	8964	493	8	60k
13:11:37	974	83	749	130	48	903	948	2961	68	8964	493	8	60k
13:12:37	976	83	745	130	48	903	948	2961	68	8964	493	8	60k
13:13:37	978	83	749	133	48	903	948	2961	68	8964	493	8	60k

Command ===>

F1=Help F4=Top F5=Bot F7=Bkwd F8=Fwd F10=Left F11=Right F12=Return

MA a 23/015

Connected to remote server/host gdlvme.pok.ibm.com using port 23 usendl3f-250-02-P014-Endicott-N on usendl3f

TCPCONF – TCPIP Server Configuration

Session A - [24 x 80]

File Edit View Communication Actions Window Help

```
FCX212       CPU 2084  SER 56F5A        Status   14:05:21        Perf. Monitor

TCP/IP Configuration for Server TCPIP

                                 Total <--Allocation Limit--->   Free  Min. Elem.
Buffer Pools                    Blocks Unrestricted Restricted Blocks Depth  Size
Activity Control Block            1024           51        102    972   946   137
Client Control Block               154            7         15     86    86   344
Data Buffer                       9000          450        900   8958  8954 16384
Small Data Buffer                  500           25         50    498   498  2048
Tiny Data Buffer                    10            1          1     10    10   256
Envelope                           750           37         75    750   693  2048
Large Envelope                     150            7         15    125   100  9216
Host Pool                            0            0          0      0     0     0
Raw IP Control Block                51            2          5     49    49   240
Socket Control Block              1007           50        100    903   903   244
BSD-Style Socket Ctl. Block       1007           50        100    948   948   493
TCP Control Block                 3002          150        300   2955  2955   824
UDP Control Block                  102            5         10     70    70   276
Address Translation               1512            0          5   1510  1510   176
IP Route                           312            0          6    307   307   140

Command ===>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
MA    a                                                          23/015
```

Connected to remote server/host gdlvme.pok.ibm.com using port 23 — usendl3f-250-02-P014-Endicott-N on usendl3f

TCPICMP – TCPIP ICMP Messages Log

Session A - [24 x 80]

File Edit View Communication Actions Window Help

```
FCX206       CPU 2084  SER 56F5A  Interval 13:58:21 - 14:05:21    Perf. Monitor

TCP/IP ICMP Messages Log for Server TCPIP

          <--------------- ICMP Messages Received/s ----------------> <--------
Interval                      Un-   Time Param Source Redi-        Time Addr
End Time  Total Error reach Exceed Probl Quench  rect Echo Stamp Mask Total Err
>>Mean>>  22.88  .000  .000  .000  .000  .000  .000 22.9  .000  .00 23.63  .0
13:58:21    ...   ...   ...   ...   ...   ...   ...  ...   ...   ...   ...  .
13:59:21  24.18  .000  .000  .000  .000  .000  .000 24.2  .000  .00 24.92  .0
14:00:21  22.00  .000  .000  .000  .000  .000  .000 22.0  .000  .00 22.76  .0
14:01:21  23.91  .000  .000  .000  .000  .000  .000 23.9  .000  .00 24.64  .0
14:02:21  21.95  .000  .000  .000  .000  .000  .000 22.0  .000  .00 22.72  .0
14:03:21  22.15  .000  .000  .000  .000  .000  .000 22.2  .000  .00 22.88  .0
14:04:21  23.32  .000  .000  .000  .000  .000  .000 23.3  .000  .00 24.08  .0
14:05:21  22.65  .000  .000  .000  .000  .000  .000 22.7  .000  .00 23.38  .0

Command ===>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F10=Left  F11=Right  F12=Return
MA    a                                                          23/015
```

Connected to remote server/host gdlvme.pok.ibm.com using port 23 — usendl3f-250-02-P014-Endicott-N on usendl3f

TCPIOLOG – TCPIP I/O Activity Log

Session A - [24 x 80]

File Edit View Communication Actions Window Help

```
FCX222       CPU 2084  SER 56F5A  Interval 13:58:21 - 14:05:21    Perf. Monitor

TCP/IP I/O Activity Log for Server TCPIP

          <---- I/O per sec. ----->  <---- QDIO Activity per sec. ---->  <-----
Interval  <Requests-> <-- Bytes -->  <Data Transfers>   PCI <--Polls-->    Re-
End Time   Read Write Receive X-mit  Inbound Outbound Inter Total  Idle   ceive
>>Mean>>   .000  .326   79704  321k   52.93    30.19  .000 115.7 32.70  4.410
13:58:21    ...   ...     ...   ...    ...      ...   ...   ...   ...    ...
13:59:21   .000  .417   84590  323k   55.33    40.77  .000 135.0 38.93  4.933
14:00:21   .000  .316   71753  346k   55.34    19.93  .000 103.0 27.69  4.459
14:01:21   .000  .301   82230  330k   54.76    25.89  .000 111.0 30.60  4.224
14:02:21   .000  .300   74709  334k   54.83    33.77  .000 122.0 33.43  4.067
14:03:21   .000  .317   78572  272k   49.60    28.10  .000 109.0 31.42  4.667
14:04:21   .000  .317   83060  352k   54.20    33.62  .000 122.5 34.57  4.300
14:05:21   .000  .317   83034  288k   46.45    29.25  .000 107.7 32.27  4.217

Command ===>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F10=Left  F11=Right  F12=Return
MA    a                                                          23/015
```

Connected to remote server/host gdlvme.pok.ibm.com using port 23 — usendl3f-250-02-P014-Endicott-N on usendl3f

TCPLINKS – TCPIP LINK Activity Log

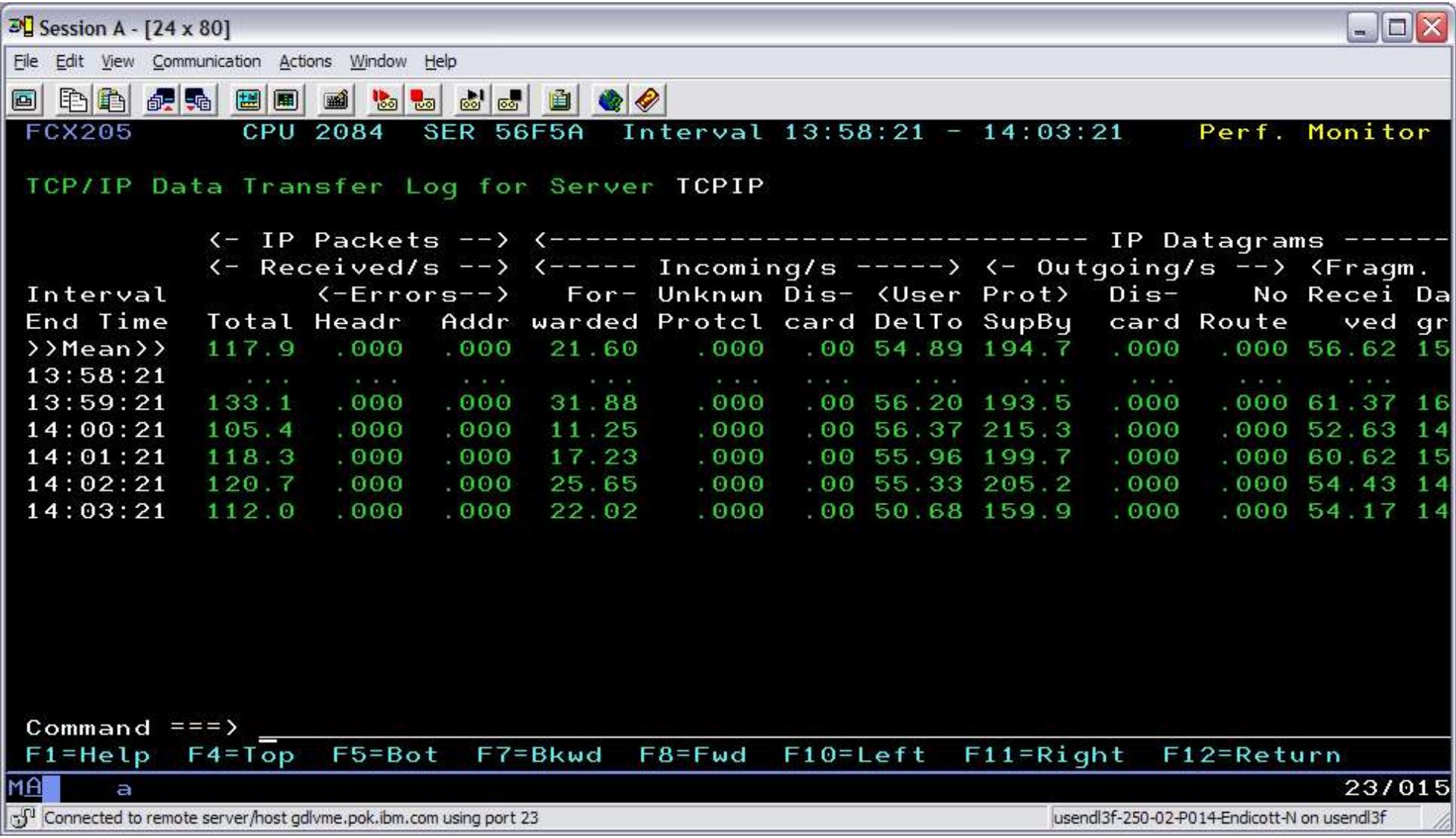
Session A - [24 x 80]

File Edit View Communication Actions Window Help

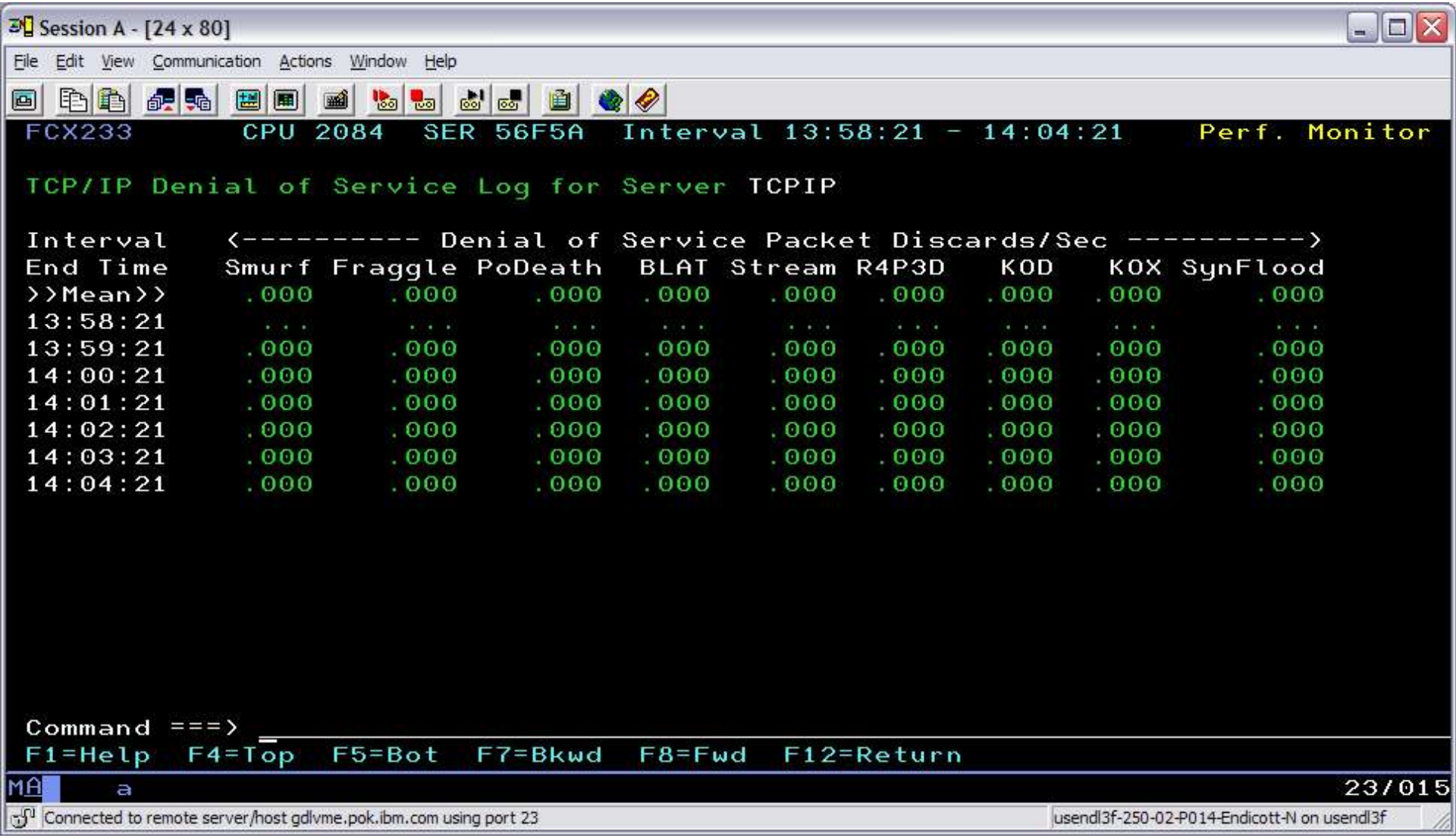
```
FCX208       CPU 2084  SER 56F5A  Interval 13:58:21 - 14:04:21     Perf. Monitor

TCP/IP Links Activity Log for Server TCPIP

                                <------------ Received/s ------------> <------ Tran
                                      <----------- Packets ----------->       <-----
Interval                              Uni-     Non- Dis-          Unknown       Uni-
End Time Link Name          Bytes     cast Unicast card Error Protocol Bytes     cast
14:03:21 ETRING1            22174 44.90      .000   .00   .000     .000 106.2   1.000
14:03:21 STK00IPV6A          .000  .000      .000   .00   .000     .000  9400  12.90
14:03:21 VNETRING            .000  .000      .000   .00   .000     .000  .000   .000
14:03:21 VNETRIN1            .000  .000      .000   .00   .000     .000  .000   .000
14:03:21 VSWITCHLINK         .000  .000      .000   .00   .000     .000  .000   .000

14:04:21 ISRING              8411 7.867      .000   .00   .000     .000 28593 36.93
14:04:21 ETRING             52319 67.70    19.03   .00   .000    1.133  313k 221.8
14:04:21 ETRING1            22330 49.62      .000   .00   .000     .000 108.1 1.017
14:04:21 STK00IPV6A          .000  .000      .000   .00   .000     .000 11176 15.55
14:04:21 VNETRING            .000  .000      .000   .00   .000     .000  .000   .000
14:04:21 VNETRIN1            .000  .000      .000   .00   .000     .000  .000   .000
14:04:21 VSWITCHLINK         .000  .000      .000   .00   .000     .000  .000   .000

Command ===>
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F10=Left  F11=Right  F12=Return
MA    a                                                              23/015
```

Connected to remote server/host gdlvme.pok.ibm.com using port 23 — usendl3f-250-02-P014-Endicott-N on usendl3f

TCPDATLG – TCPIP General Data Trans Log



TCPDOSLG – TCPIP Denial of Service Log



Accessing performance data from other userids

While PERFKIT is running in the PERFSVM machine, you can view performance data without signing directly on using:

- VMC in a PIPE
- VMCX for a full screen view using VMCF
- FCONAPPC for a full screen using APPC (Preferred)

FCONAPPC setup information

PERFKIT uses the FCONRMT AUTHORIZ file to determine who can do what.

NODEID USERID authorizations

Where authorizations can be:

- DATA
- CMD
- S&FSERV

Care must be taken when allowing CMD, any CP command that PERFSVM is allowed can be issued from the FCONAPPC session

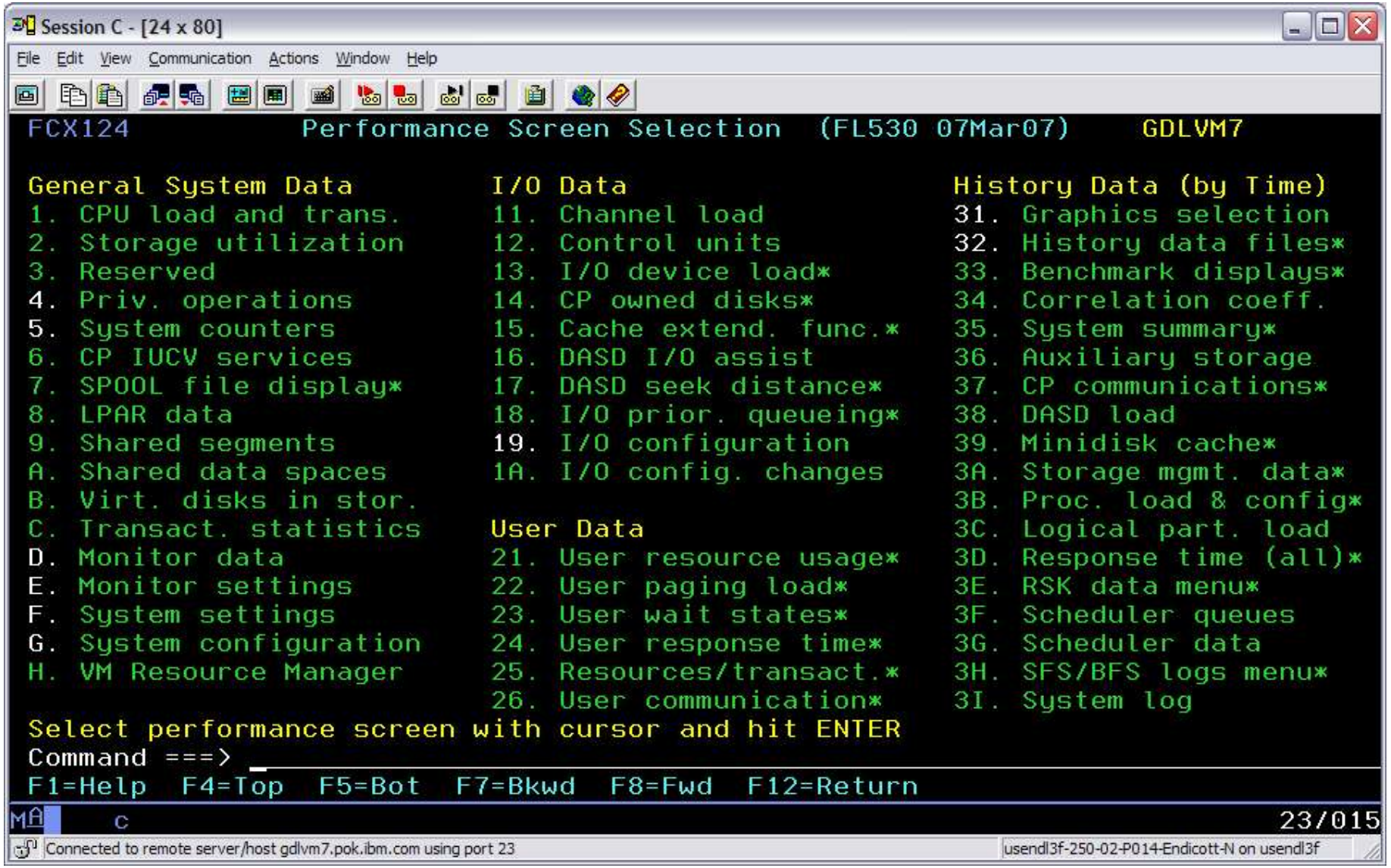
FCONAPPC resourcename

The PERFSVM machine ships using APPC resource name FCXRES00

To access data from another userid start PERFKIT in that userid then enter **FCONAPPC FCXRES00**

The menu screen will be shown:

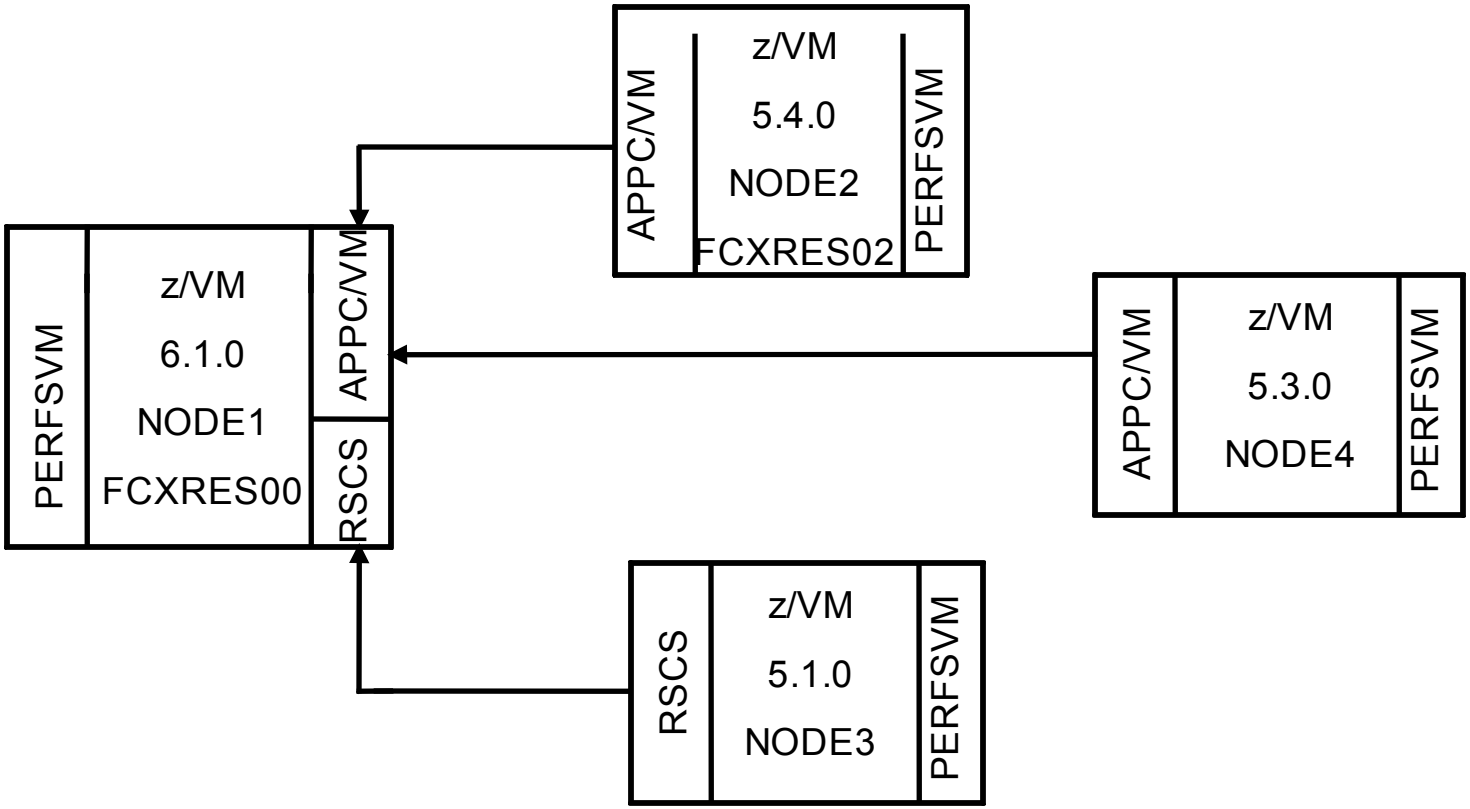
FCONAPPC resourcename



IBM Performance Toolkit for VM

Central Data Collection

- Allows efficient central performance monitoring for my remote systems
- Concurrent multiple access to the central machine's data
- Performance data retrieval from local and remote machines similar to native monitoring



Central Data Collection

NODE1 Setup Files

File FCONRMT SYSTEMS

```
*System Definition file for remote monitoring
*Node-ID PERFKIT-ID VM_Type Append Nickname
*|       |          |       |      |
NODE2    PERFSVM   z/VM5.4   N      FCXRES02
NODE3    PERFSVM   z/VM5.3   N      FCXRES03
NODE4    PERFSVM   z/VM5.1   N
```

File FCONRMT AUTHORIZ

```
*Authorization file for local and remote data retrieval and
*command execution
*Node-ID      User-ID       Authorized for ..
* NO ENTRIES NEEDED FOR COLLECTION
```

NOTE: To enable the Web Server, you will need entries for node 1

```
NODE1    PERFSVM   z/VM6.1   N      FCXRES00
```

```
NODE1      PERFSVM      S&FSERV  DATA
```

Central Data Collection

NODE2 Setup files

File FCONRMT SYSTEMS

```
*System Definition file for remote monitoring
*Node-ID PERFKIT-ID VM_Type Append Nickname
*|         |           |         |        |
*NO ENTRIES NEEDED
```

File FCONRMT AUTHORIZ

```
*Authorization file for local and remote data retrieval and
*command execution
*Node-ID     User-ID     Authorized for ..
NODE2        PERFSVM     S&FSERV  DATA
```

Directory Entry for PERFSVM at NODE2

```
IUCV *IDENT FCXRES02 GLOBAL
IUCV ALLOW
```

UCOMDIR NAMES A

```
:nick.FCXRES00          :luname.*IDENT
                        :tpn.FCXRES02
                        :security.SAME
```

Central Data Collection

NODE3 Setup files

File FCONRMT SYSTEMS

```
*System Definition file for remote monitoring
*Node-ID PERFKIT-ID VM_Type Append Nickname
*|         |           |         |        |
*NO ENTRIES NEEDED
```

File FCONRMT AUTHORIZ

```
*Authorization file for local and remote data retrieval and
*command execution
*Node-ID     User-ID     Authorized for ..
NODE3        PERFSVM     S&FSERV  DATA
```

Directory Entry for PERFSVM at NODE2

```
IUCV *IDENT FCXRES03 GLOBAL
IUCV ALLOW
```

UCOMDIR NAMES A

```
:nick.FCXRES00          :luname.*IDENT
                        :tpn.FCXRES03
                        :security.SAME
```

Central Data Collection

NODE4 Setup Files

File FCONRMT SYSTEMS

File FCONRMT AUTHORIZ

No entries needed in either of these files, just need:

FC MONCOLL REMSEND ON RSCS nodeid userid

In FCONX $PROFILE or entered manually

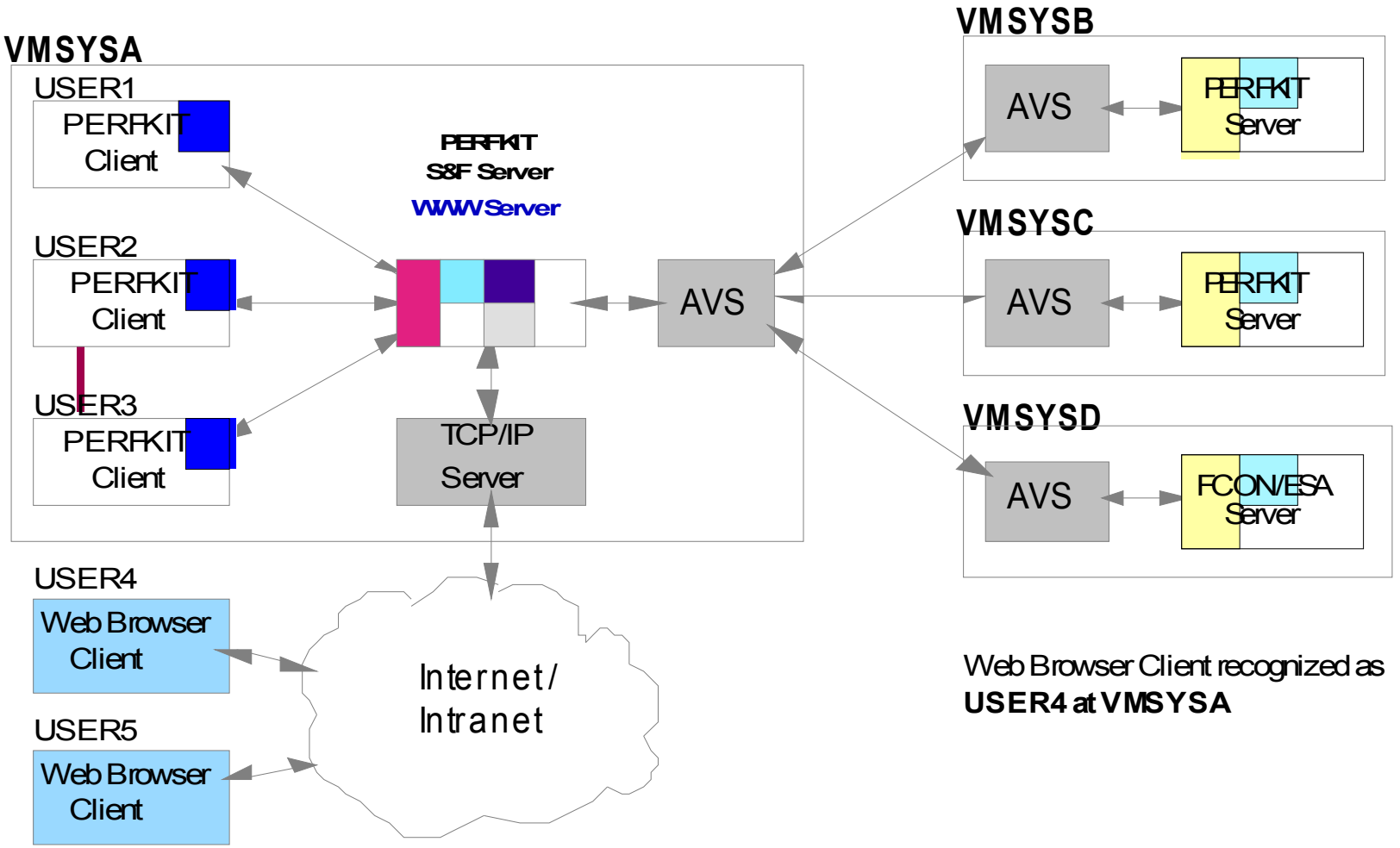
NOTE: FL510 is no longer a supported release

Central Data Collection

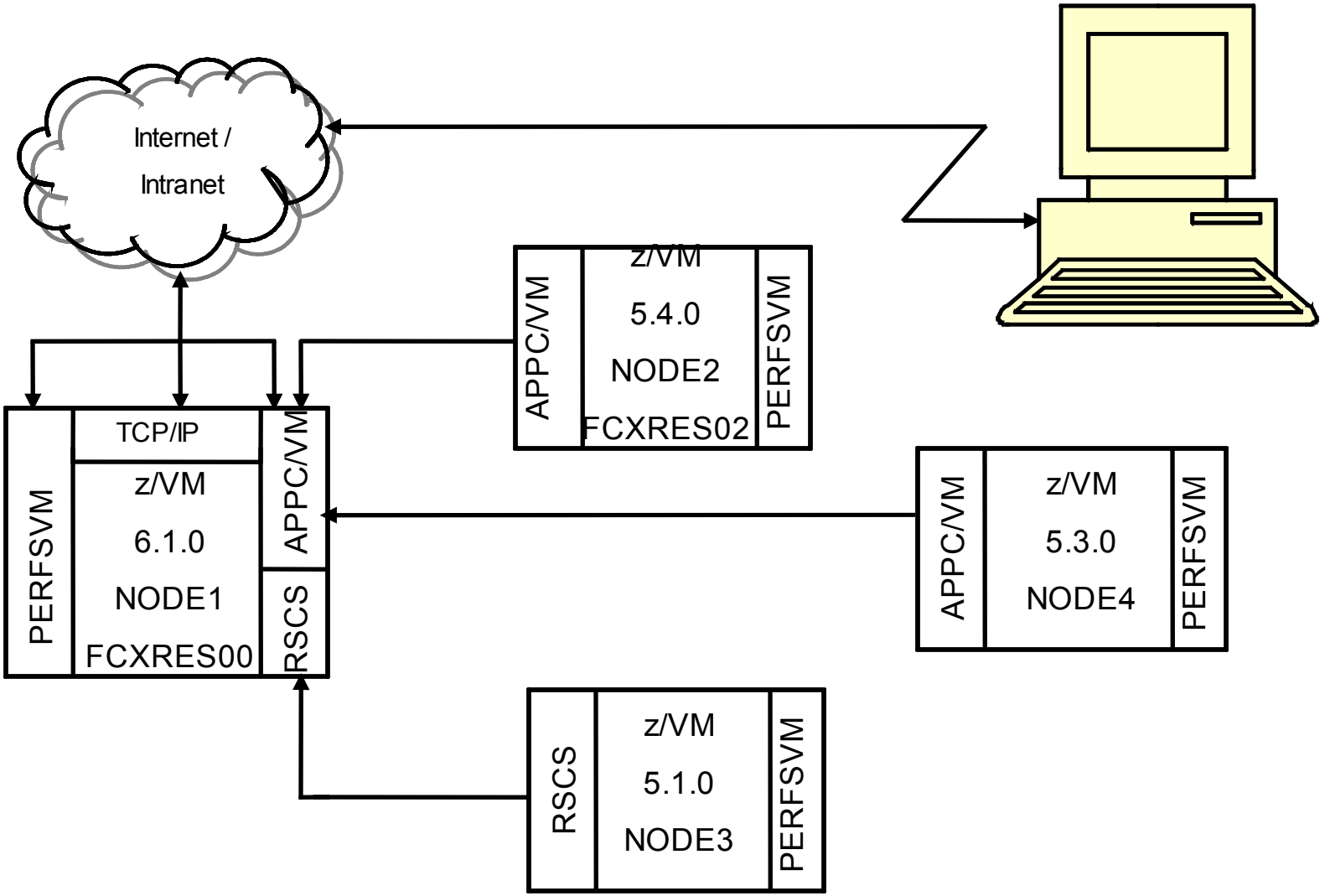
Summary:

- PERFKIT (since FL520) will “pull” data from other PERFKIT systems using APPC/VM when that system is Identified in the FCONRMT SYSTEMS file with a resource name
- PERFKIT will receive data “pushed” from other PERFKIT systems at FL510 or lower using RSCS

Web Access



Web Setup



IBM Performance Toolkit for VM

Web Setup

Performance Toolkit for VM includes an internet interface intended to:

- Provide a graphical user interface based on standard web browsers, thus automatically allowing it's use from any of the common supported platforms
- Allow the use of the interface with a minimum of additional prerequisites

The PERFKIT web interface is designed to process only the subset of HTTP requests it expects for a performance retrieval session.

The internet interface works directly with the "store and forward" logic.

Web Setup

To setup web access you need to:

1. Implement S&F Server - See Central Data Collection
2. Implement IUCV connection to TCPIP machine
3. Activate the interface
4. Test the interface

Web Setup

2. Implement IUCV connection to TCPIP machine

- Decide on a TCP/IP port number to be used
- Update the PROFILE TCPIP on the TCPIP machine

PORT

…..

nn TCP PERFSVM NOAUTOLOG; Performance Toolkit for VM Internet Server

Or for SSL:

nn TCP PERFSVM NOAUTOLOG SECURE ***filename/label***; Performance Toolkit for VM Internet Server SSL

…..

- Update FCONX $PROFILE to activate the webserver interface

FC MONCOLL WEBSERV ON TCPIP TCPIP ***nn*** IDTEST CP

Or for SSL:

FC MONCOLL WEBSERV ON SSL TCPIP TCPIP 81 IDTEST RACF

SEE The PERFKIT book for more information on userid verification in the "Internet Interface" Section

- Activate the interface – Restart PERFKIT, you should see messages similar to:

FCXTCP571I Connected to TCP/IP server TCPIP on path 0004

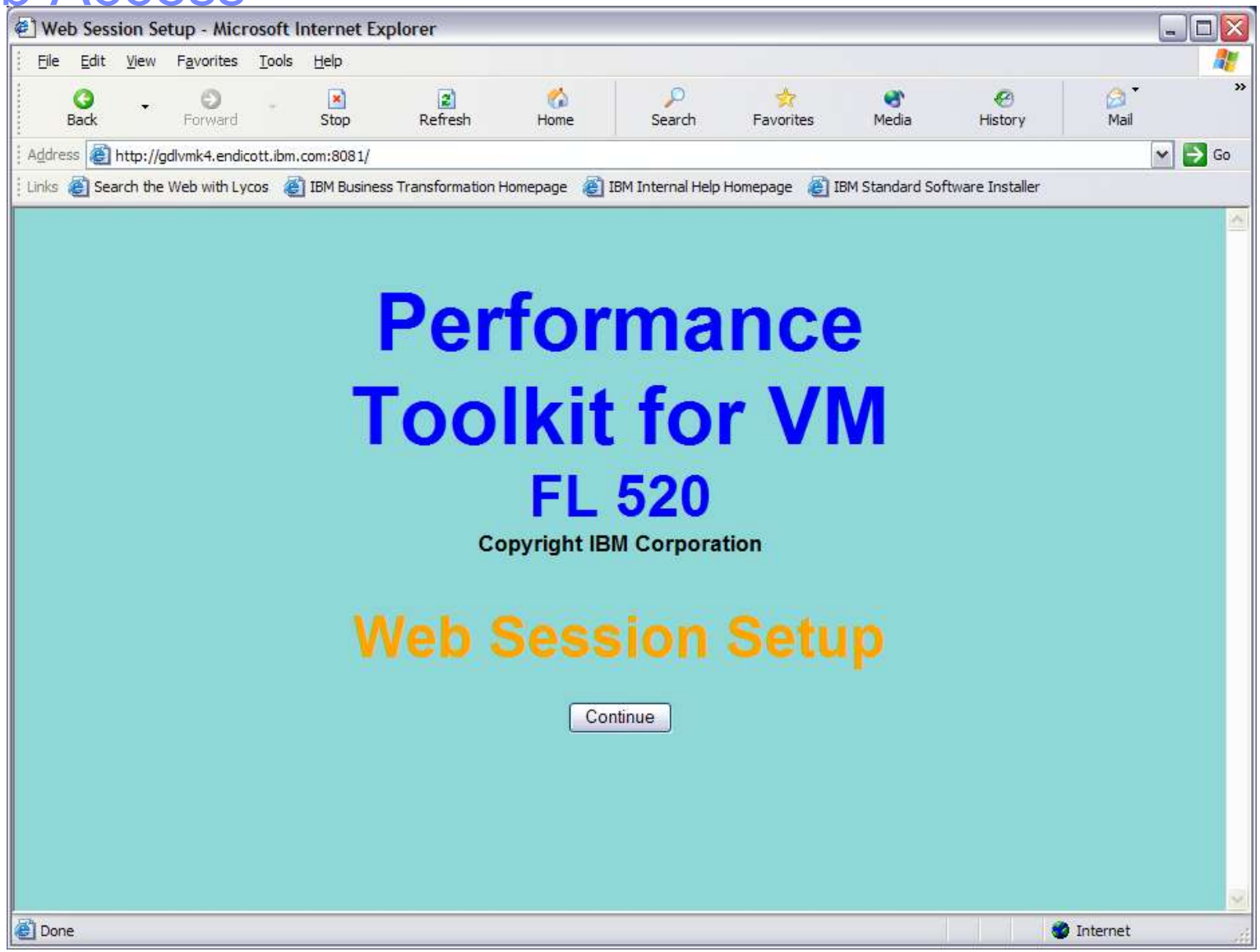
FCXTCP575I Host IP address is 11.22.33.44:***nn***

FCXTCP590I WebServer interface activated

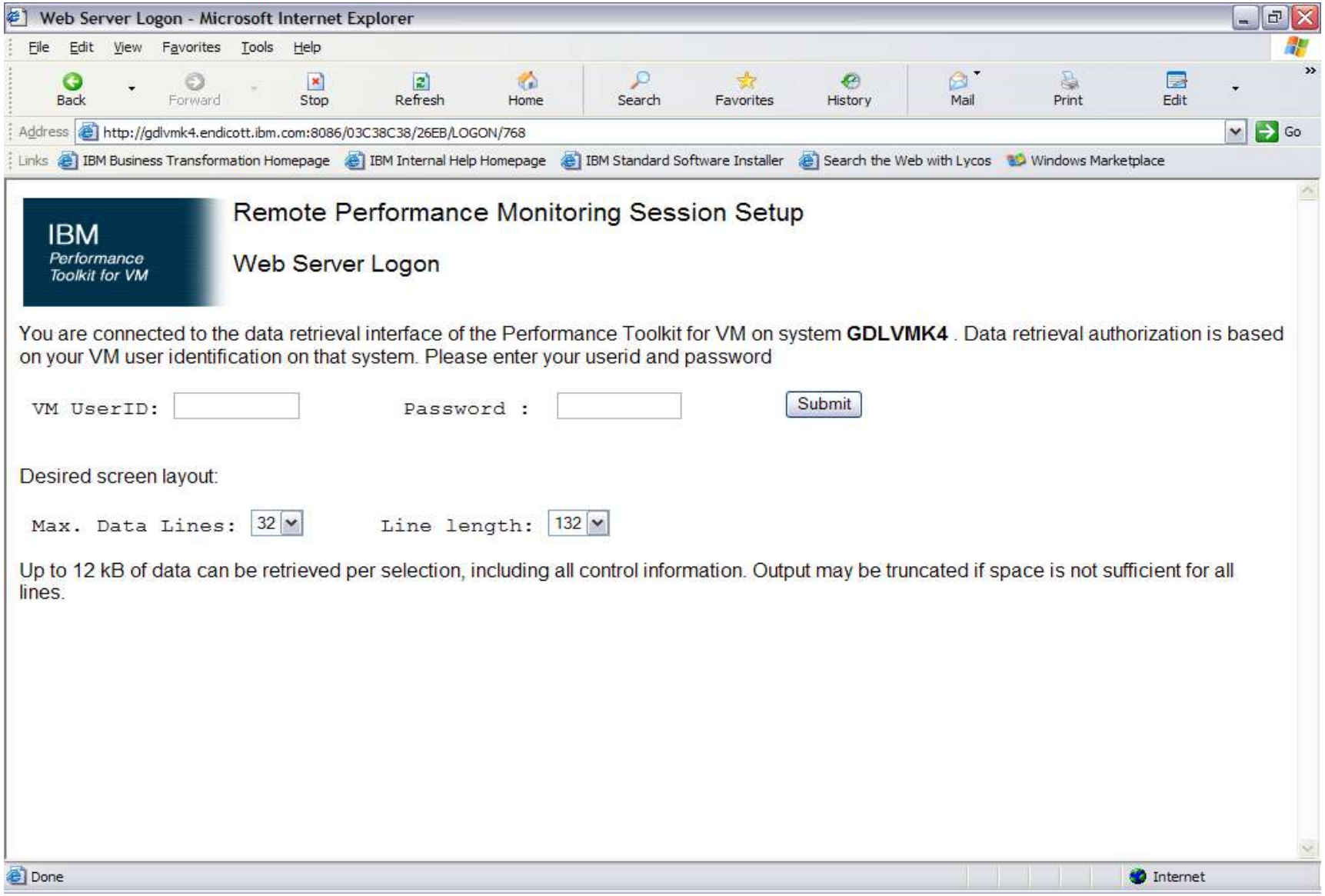
- Activate your web browser and select the URL for Performance Toolkit

http://11.22.33.44:***nn*** or for SSL https://11.22.33.44:***nn***

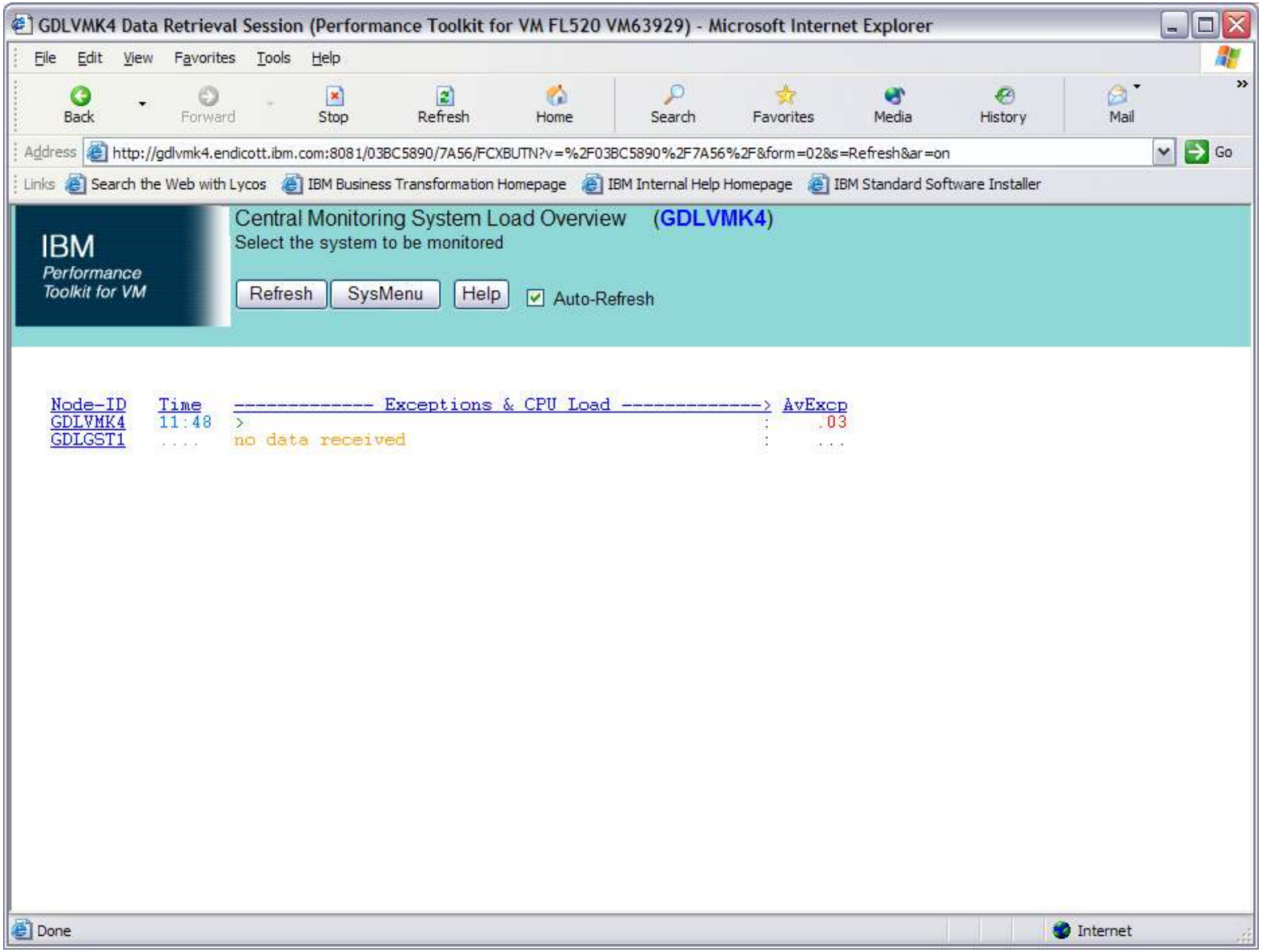
Web Access

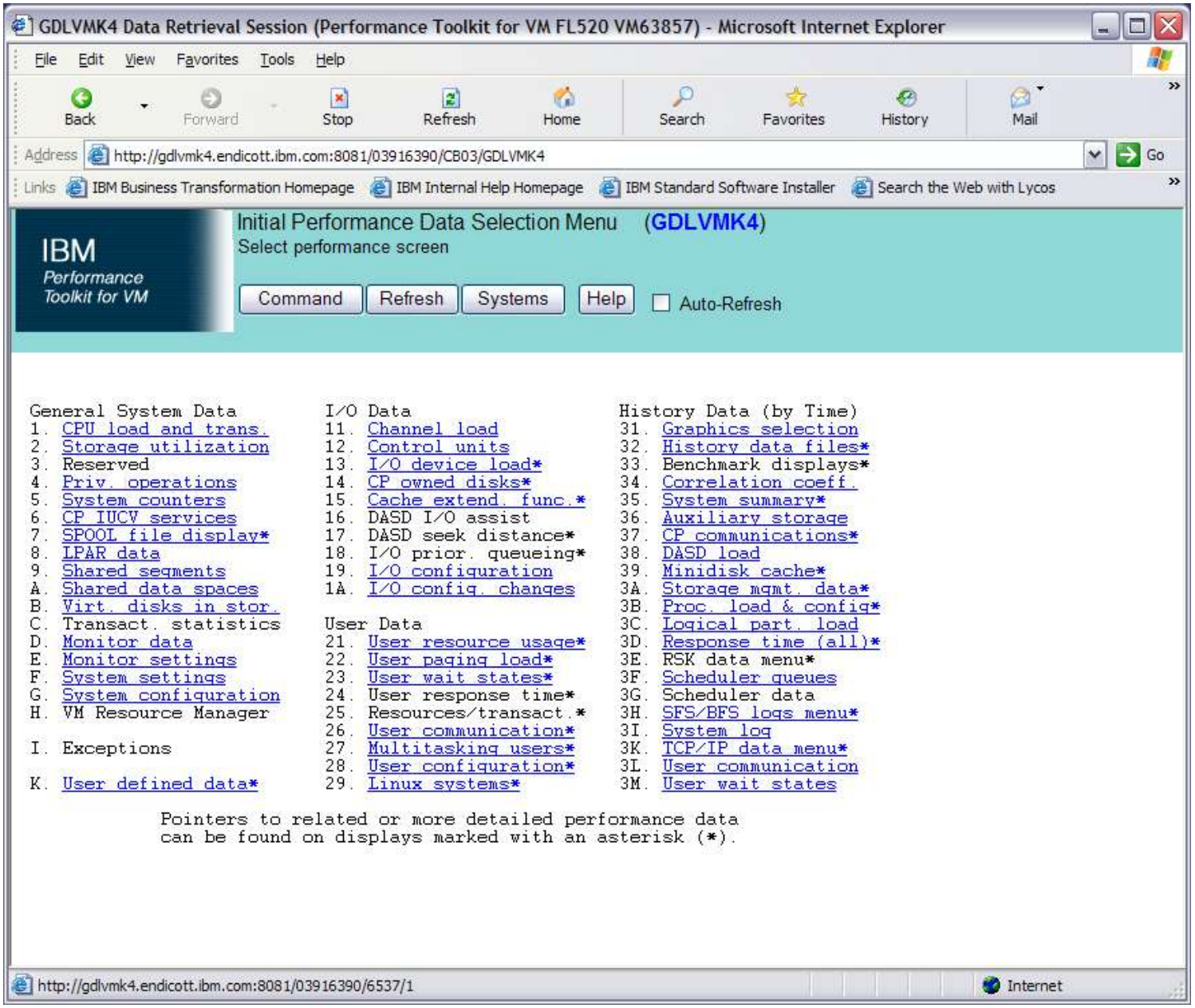


Web Access



Web Access





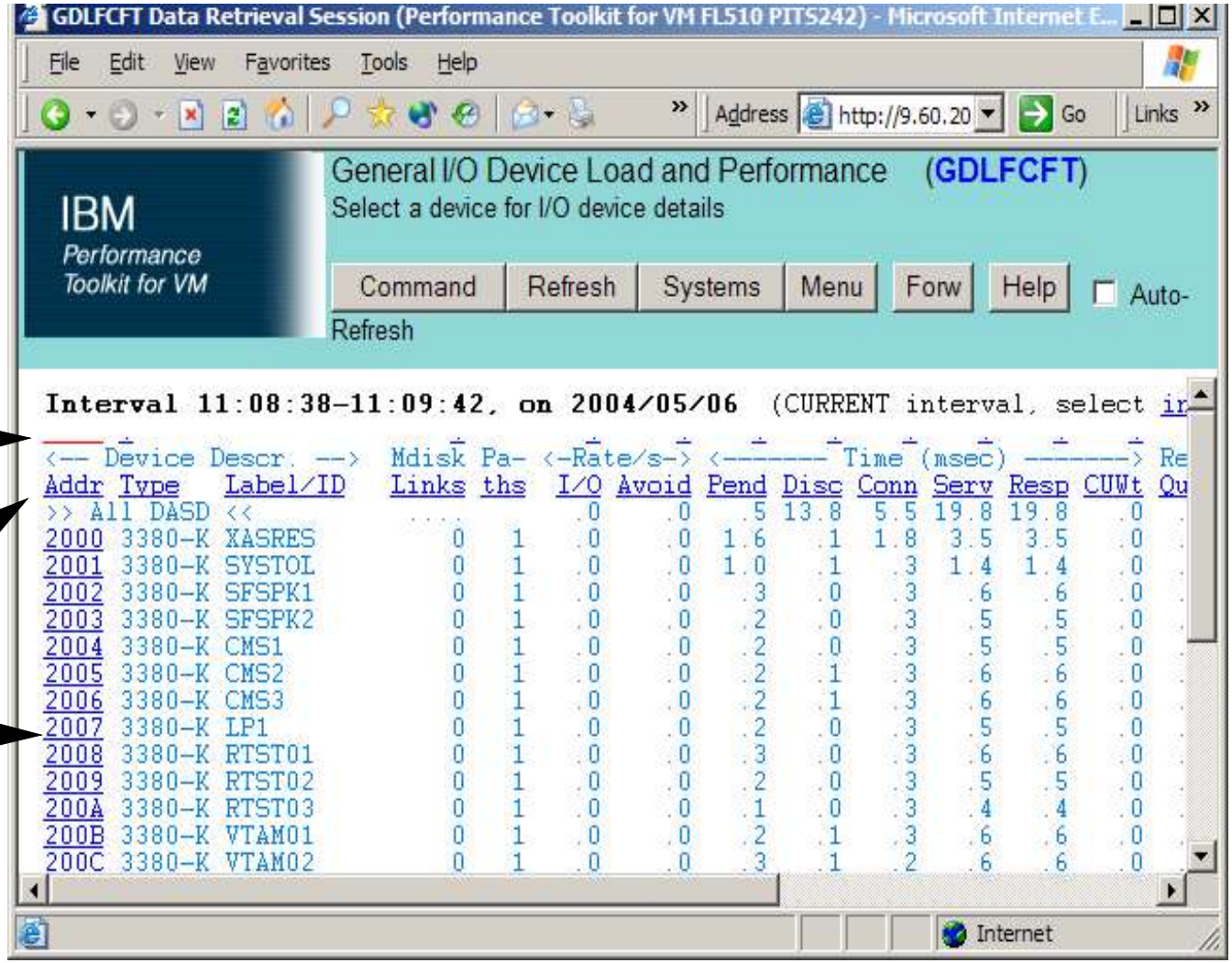
Example - Performance Data Display

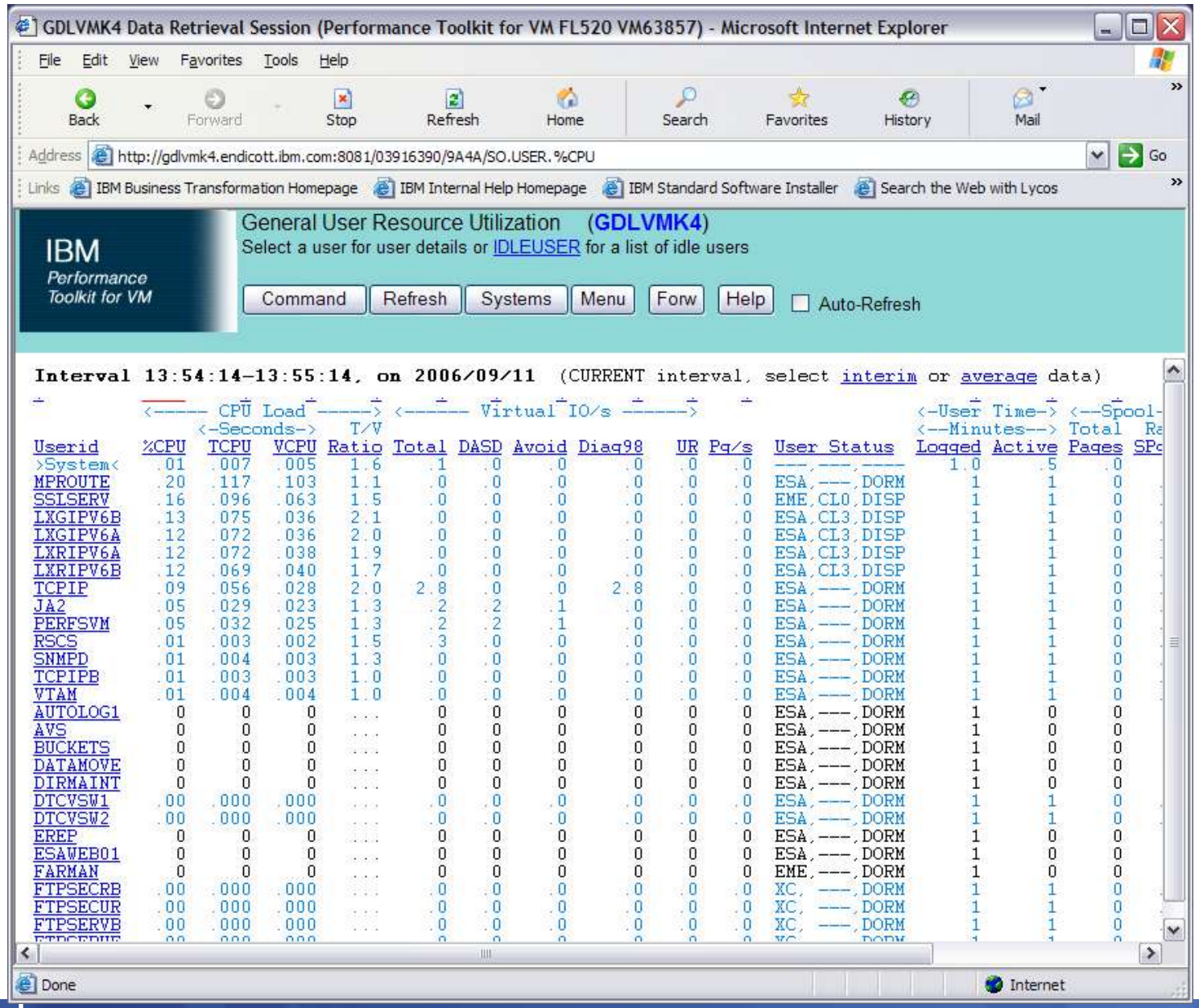
Hyperlink selection of:

Sort sequence

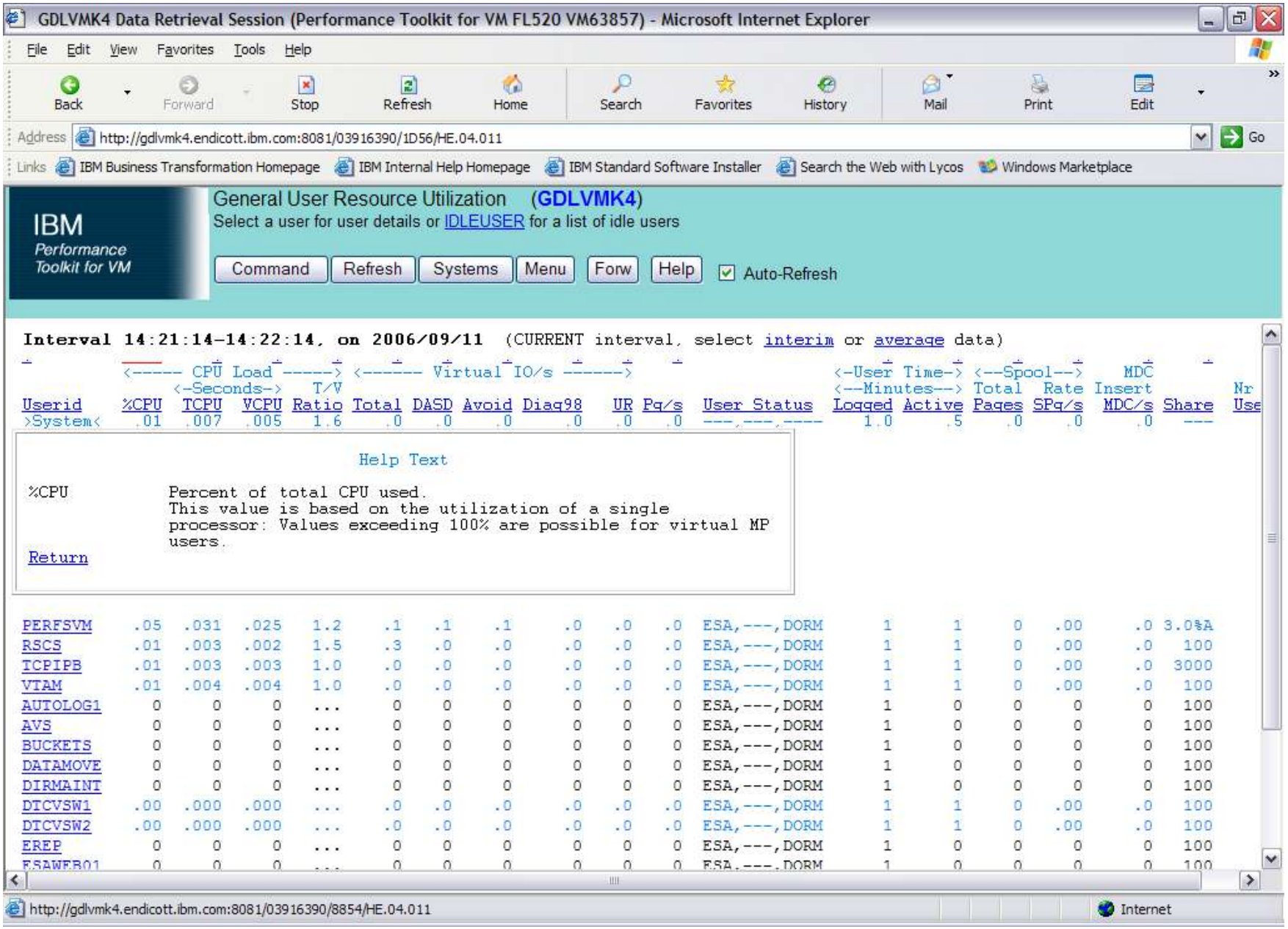
Context help

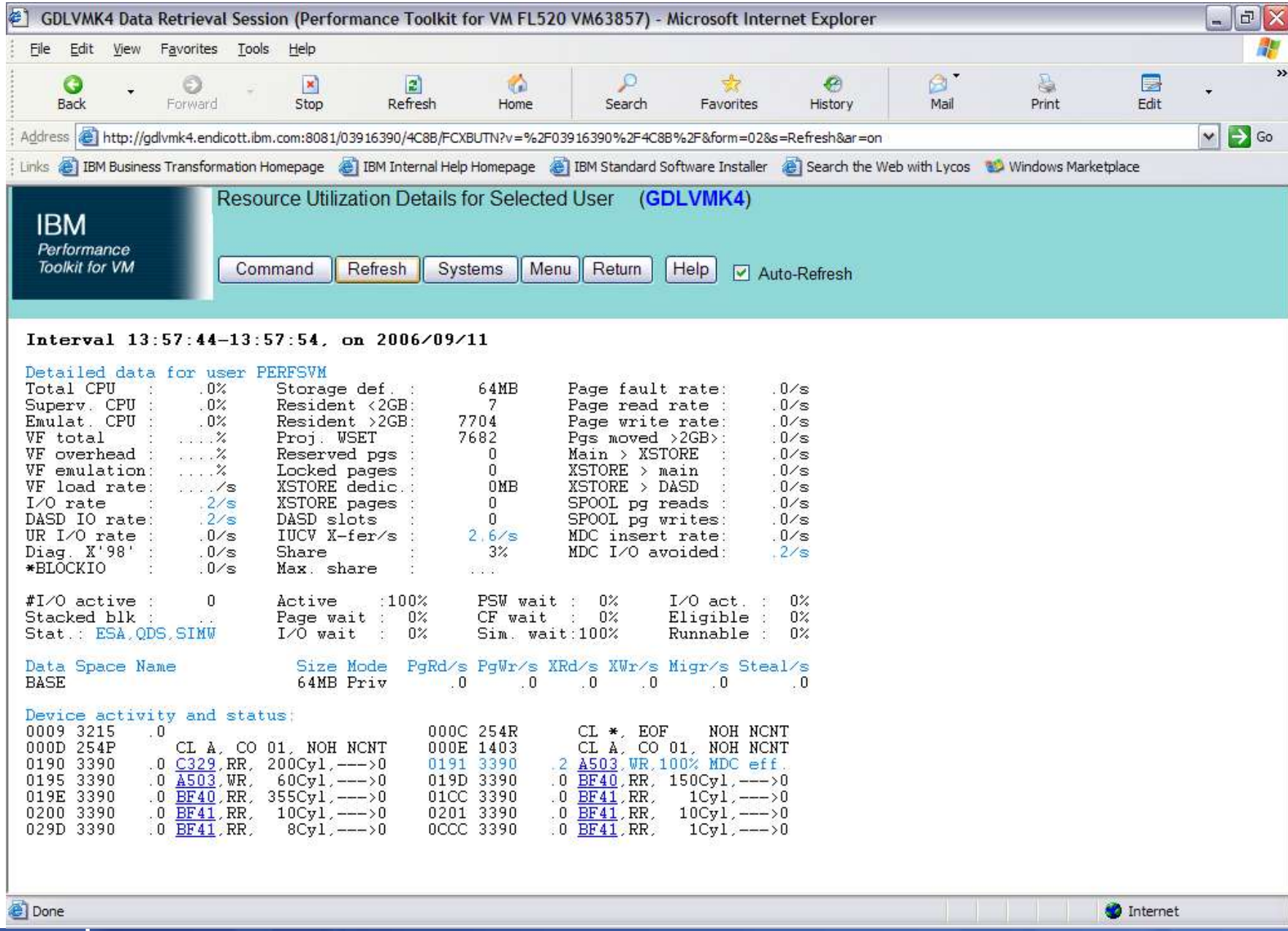
Device details

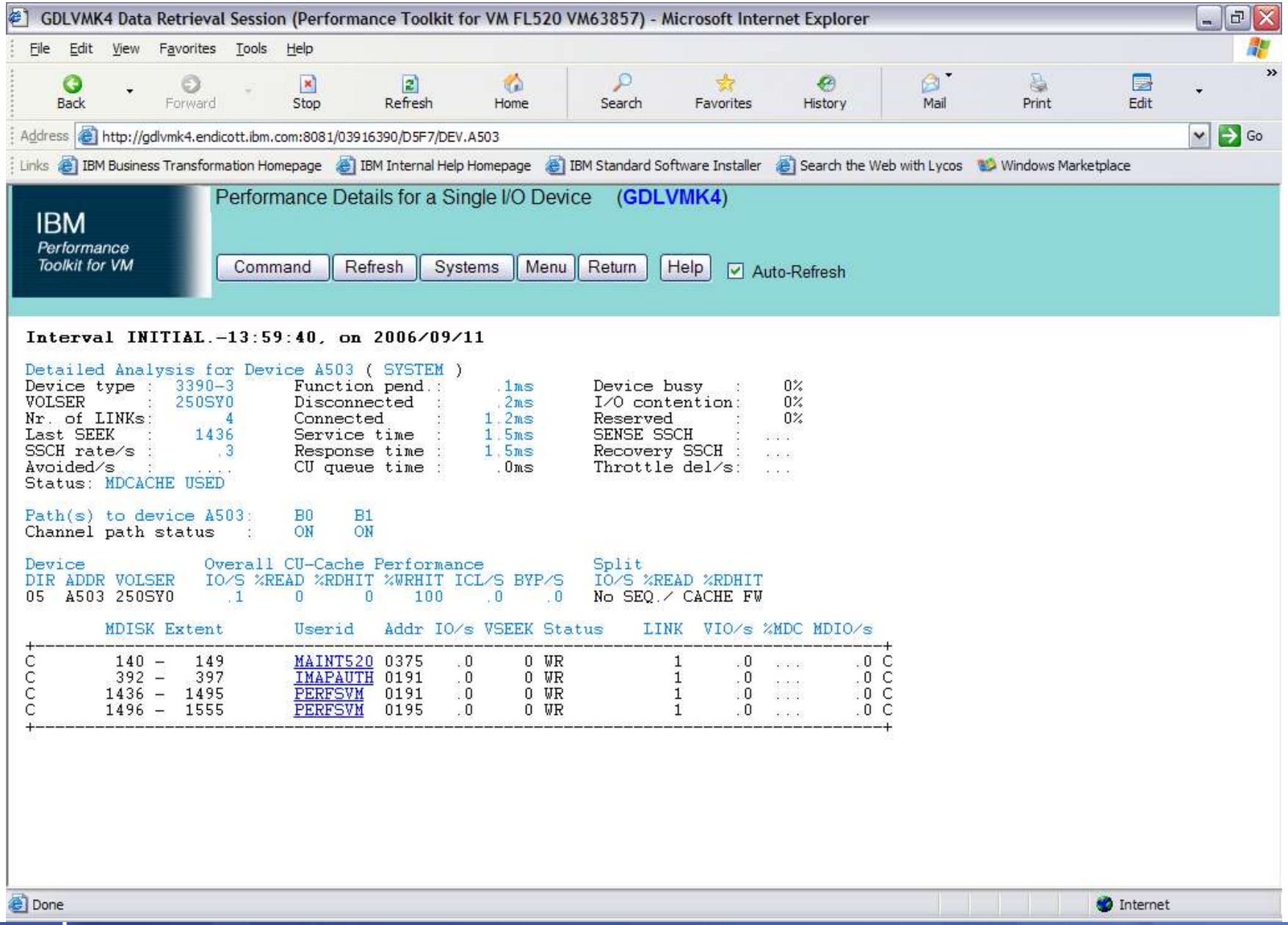




Userid	%CPU	TCPU	VCPU	T/V Ratio	Total	DASD	Avoid	Diag98	UR	Pg/s	User Status	Logged	Active	Total Pages
>System<	.01	.007	.005	1.6	.1	.0	.0	.0	.0	.0	---,----,----	1.0	.5	.0
MPROUTE	.20	.117	.103	1.1	.0	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0
SSLSERV	.16	.096	.063	1.5	.0	.0	.0	.0	.0	.0	EME,CL0,DISP	1	1	0
LXGIPV6B	.13	.075	.036	2.1	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0
LXGIPV6A	.12	.072	.036	2.0	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0
LXRIPV6A	.12	.072	.038	1.9	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0
LXRIPV6B	.12	.069	.040	1.7	.0	.0	.0	.0	.0	.0	ESA,CL3,DISP	1	1	0
TCPIP	.09	.056	.028	2.0	2.8	.0	.0	2.8	.0	.0	ESA,---,DORM	1	1	0
JA2	.05	.029	.023	1.3	.2	.2	.1	.0	.0	.0	ESA,---,DORM	1	1	0
PERFSVM	.05	.032	.025	1.3	.2	.2	.1	.0	.0	.0	ESA,---,DORM	1	1	0
RSCS	.01	.003	.002	1.5	.3	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0
SNMPD	.01	.004	.003	1.3	.0	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0
TCPIPB	.01	.003	.003	1.0	.0	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0
VTAM	.01	.004	.004	1.0	.0	.0	.0	.0	.0	.0	ESA,---,DORM	1	1	0
AUTOLOG1	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
AVS	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
BUCKETS	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
DATAMOVE	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
DIRMAINT	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
DTCVSW1	.00	.000	.000	...	0	0	0	0	0	0	ESA,---,DORM	1	1	0
DTCVSW2	.00	.000	.000	...	0	0	0	0	0	0	ESA,---,DORM	1	1	0
EREP	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
ESAWEB01	0	0	0	...	0	0	0	0	0	0	ESA,---,DORM	1	0	0
FARMAN	0	0	0	...	0	0	0	0	0	0	EME,---,DORM	1	0	0
FTPSECRB	.00	.000	.000	...	0	0	0	0	0	0	XC,---,DORM	1	1	0
FTPSECUR	.00	.000	.000	...	0	0	0	0	0	0	XC,---,DORM	1	1	0
FTPSERVB	.00	.000	.000	...	0	0	0	0	0	0	XC,---,DORM	1	1	0







Graphics

PERFKIT Graphics include:

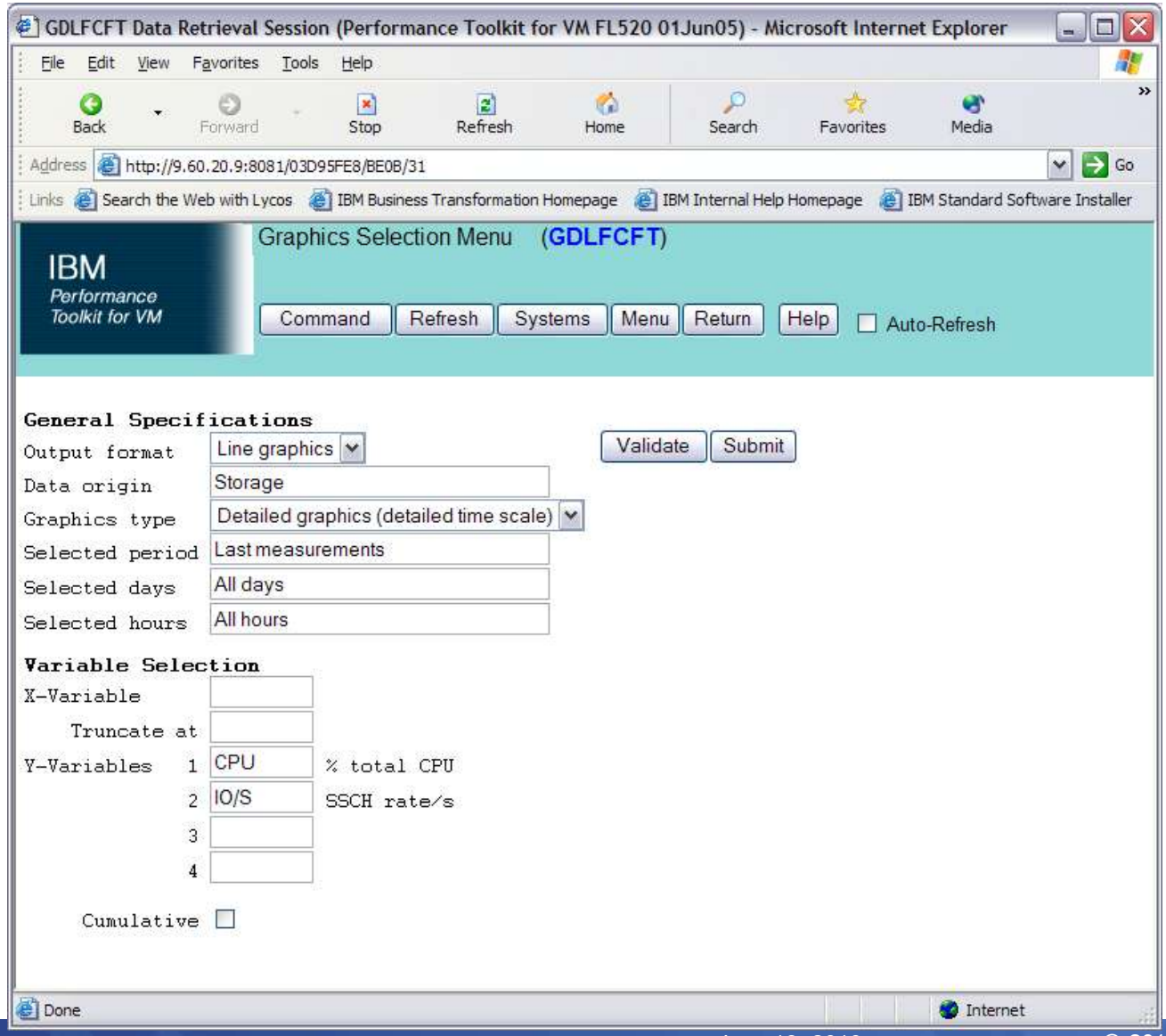
- PLOTS – using 3270 and characters like *, o, =, /
- GDDM Graphics – using 3270 and GDDM
- Browser – using your web browser

Graphs can be created from:

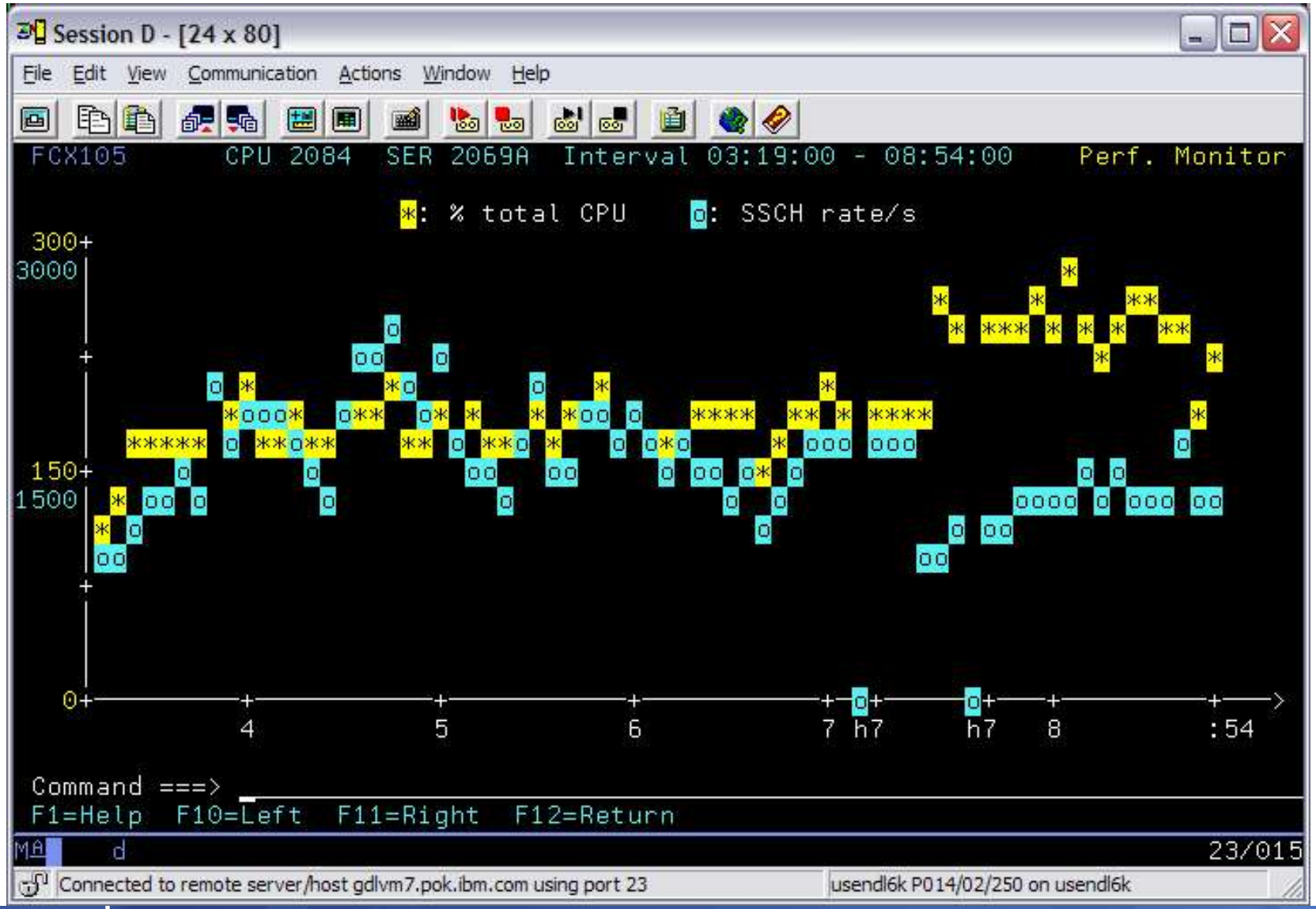
- Storage – using data just collected
- History Files – using data saved from an earlier time

Enter ***GRAPHICS*** from monitor mode or select option ***31***

Graphics

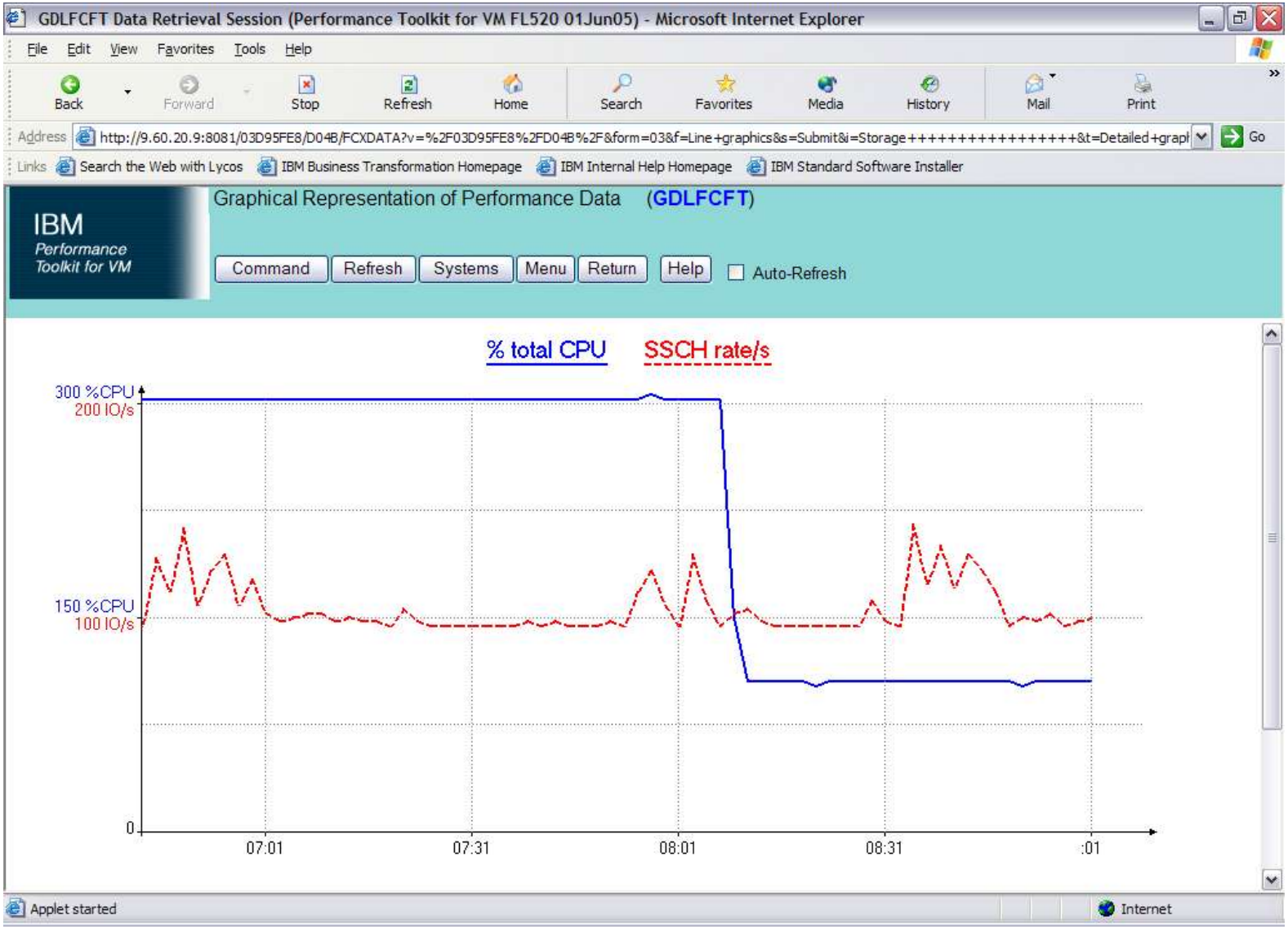


Graphics - PLOT

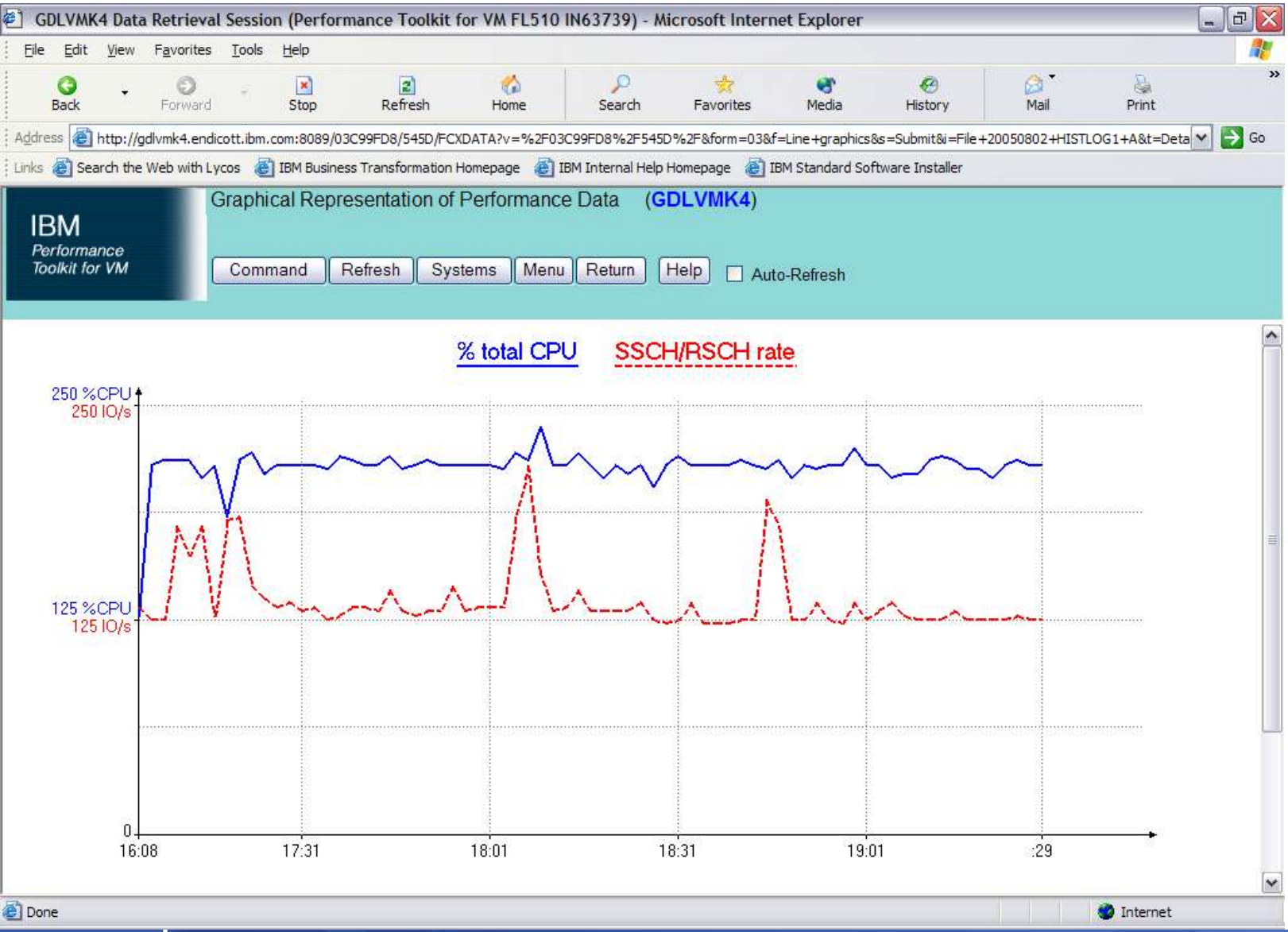


Graphics - GDDM

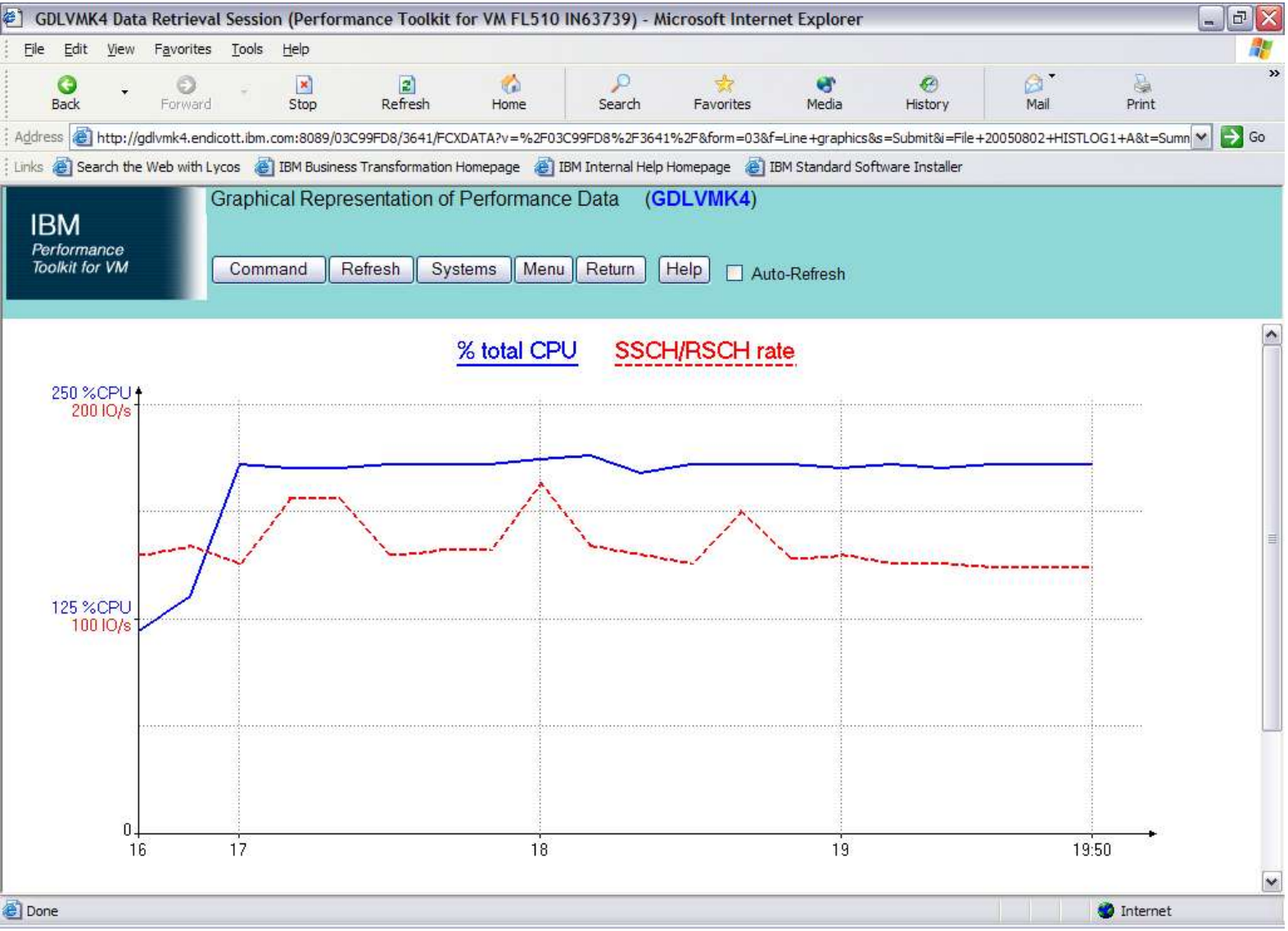
Graphics - WEB



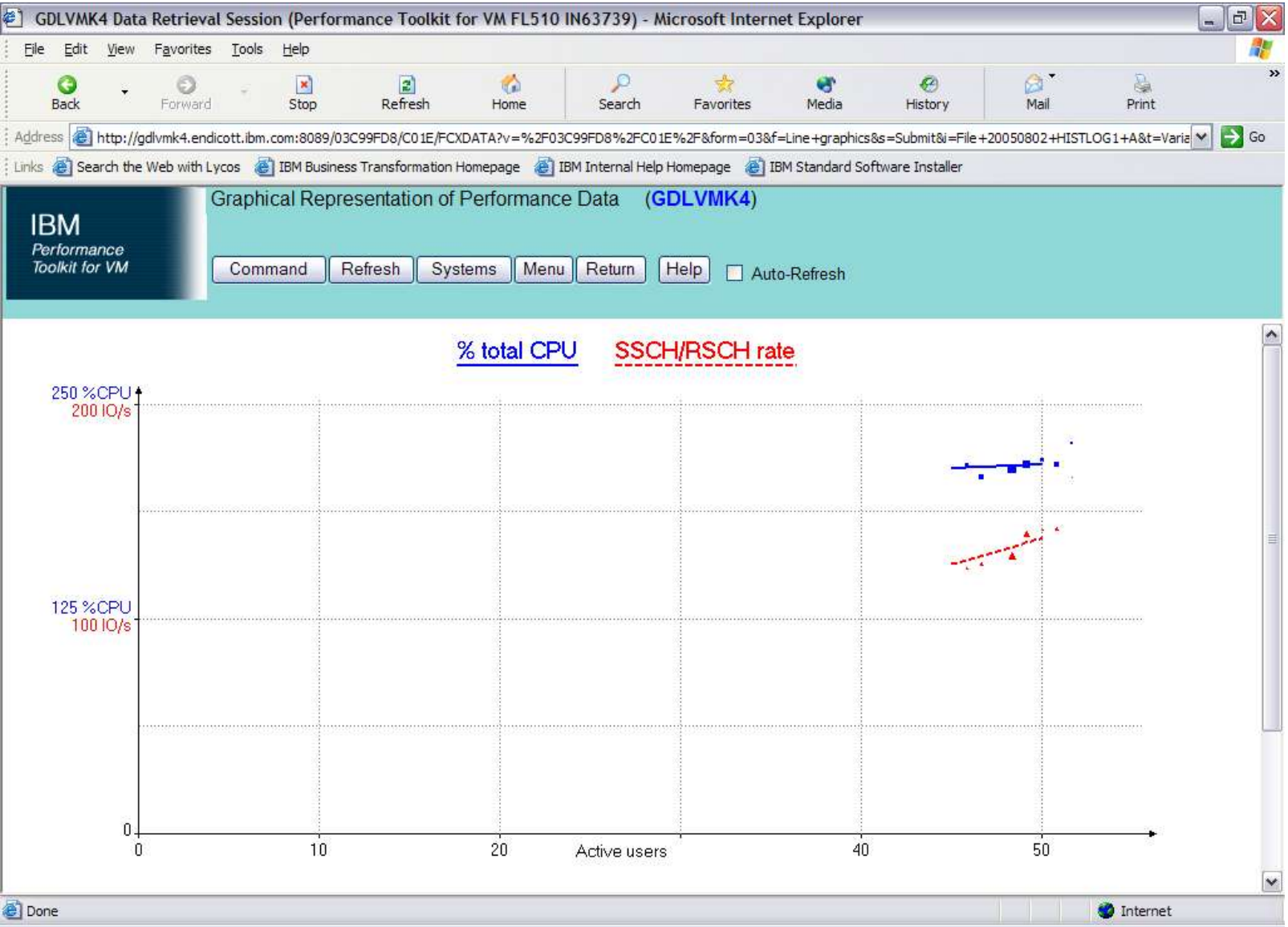
Graphics – Detailed



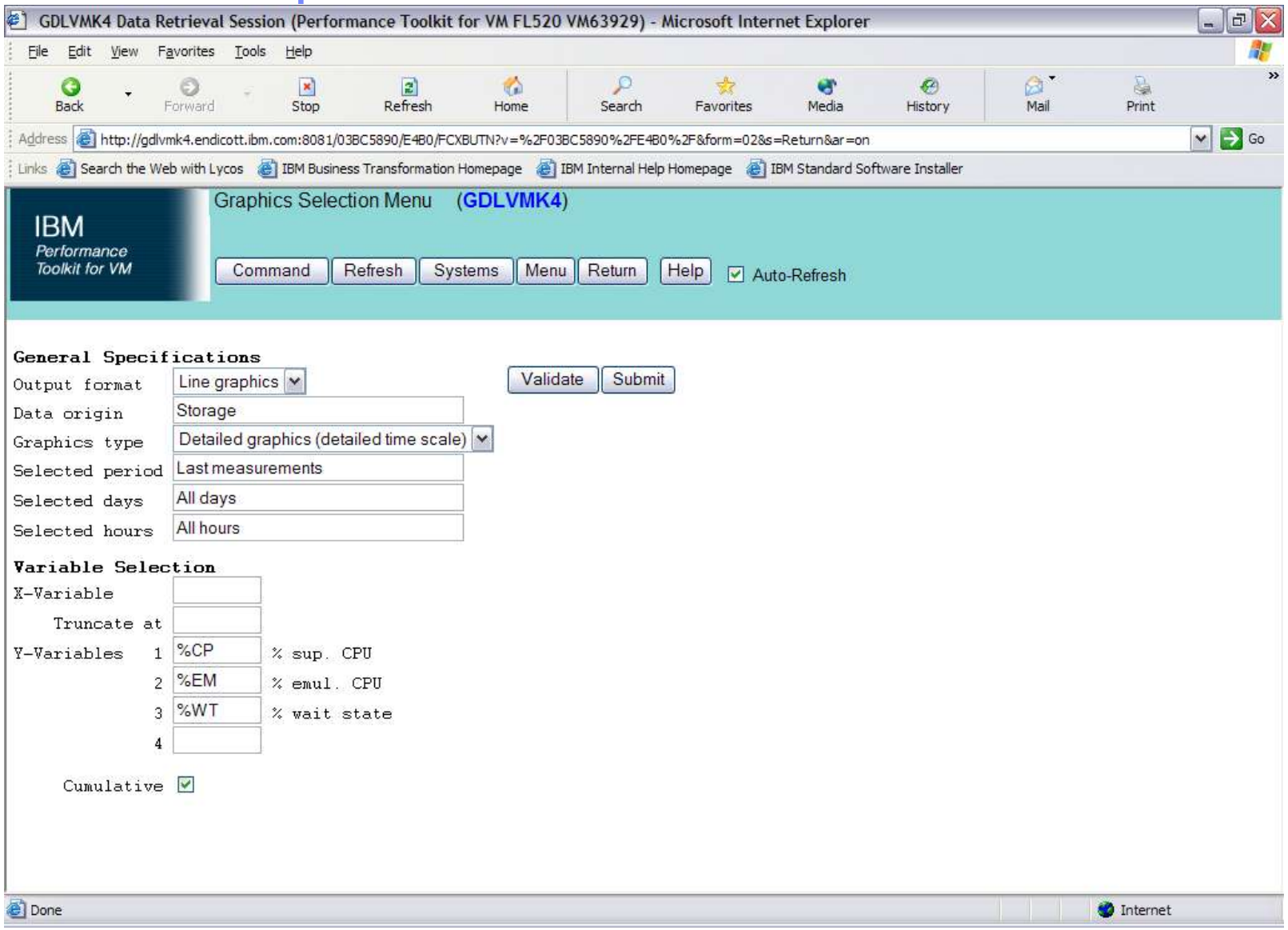
Graphics - Summary



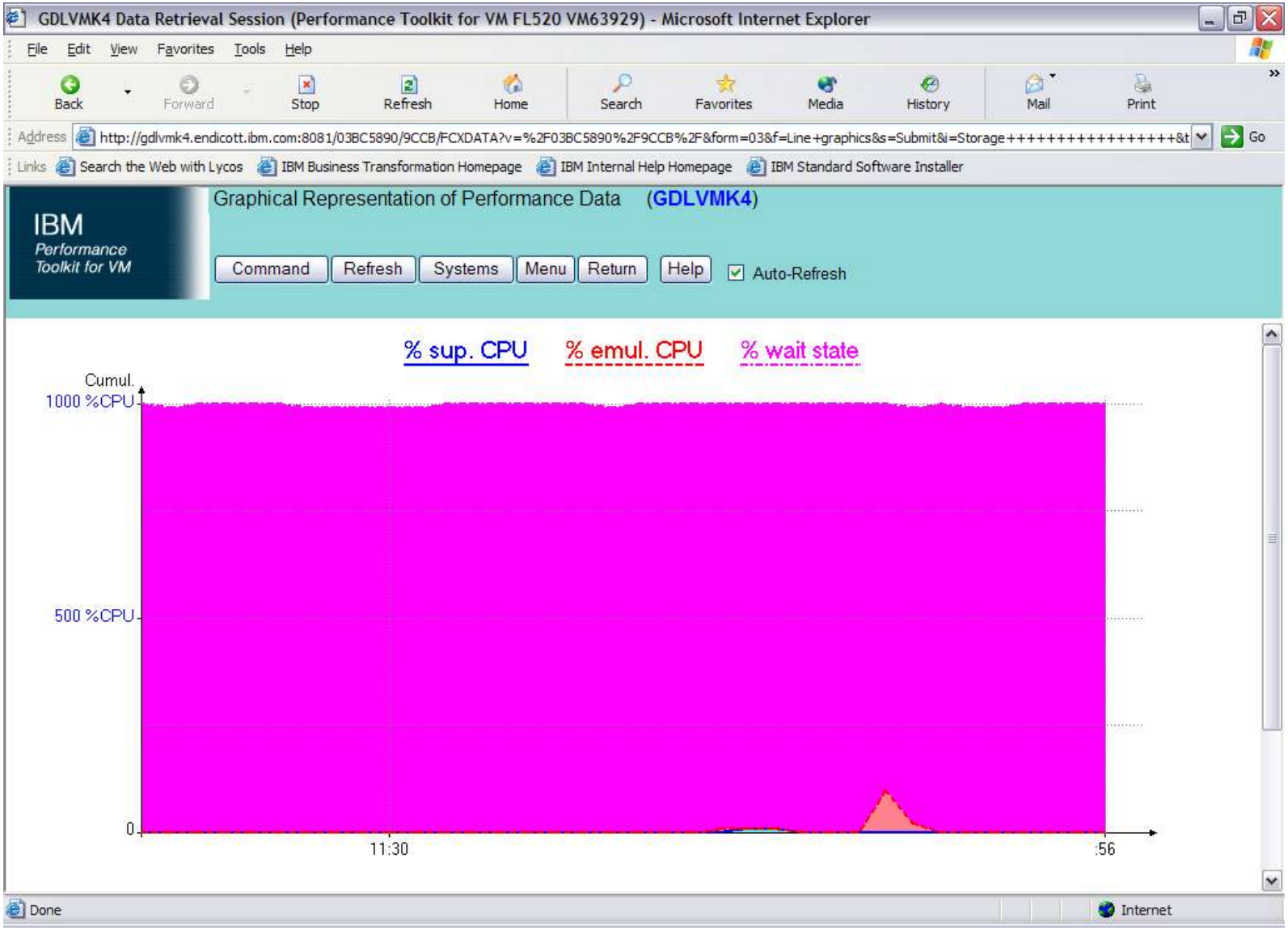
Graphics – Variable Correlation



Cumulative Graphs



Cumulative Graphs



Graphics - review

Option ***31*** or ***GRAPHICS***

Select Format

- LINE for PLOT for WEB
- GDDM or PLOT for 3270

Select Data Origin

- Storage or history files

Select Type – Detailed, Summary or Correlation

Select Period, Days (ALL, M-F, MON …), Hours

Select Variables – from pulldown or REDISP headings

Batch Processing

- BATCH MODE
  - PERFKIT BATCH masterfn masterft masterfm DISK fn ft fm
  - specify master file to use
  - specify MONDATA file to be used as input
- VMPRF "migration aid" MODE (removed in z/VM 6.1.0)
  - PERFKIT VMPRF masterfn masterft masterfm DISK fn ft fm
  - specify VMPRF MASTER file to use
  - Creates masterfn FCXEQUIV file with PERFKIT REPORTS
  - Creates fn RUNFILE similar to VMPRF with PERFKIT Settings
- Real time mode of operation
  - Create REPORT, TREND, SUMMARY data throughout the day
  - using FC MONCOLL RESET settings in FCONX $PROFILE
  - Use BATCH mode to post process as needed
  - Use MONSCAN or TRNDSCAN to "walk through" history data

Batch Mode – MASTER file

- Input files
  - SETTINGS FCONX SETTINGS *
  - REPORTS FCONX REPORTS *
  - SUMREC FCONX SUMREC *
  - TRENDREC FCONX TRENDREC *

Batch Mode – MASTER file

- Output files
  - LOG BATCH LOG B
  - LISTING BATCH LISTING B
  - RUNFILE BATCH RUNFILE B
  - SUMMARY BATCH SUMMARY B
  - TREND BATCH TREND B

BATCH SETTINGS file

```
* Perfkit Settings File
* Limit reduction to Noon to 15:45
  FC MONCOLL RESET 12:00r_p 15:45p
* Interim reports generated for every 15 minute period

  FC SET INTERIM  15 MINUTES
* The log-like reports show a row for every minute
  FC SET BYTIME  1 MINUTES
* Detailed reports (logs) for these users and devices

  FC BENCHMRK USER BITNER
```

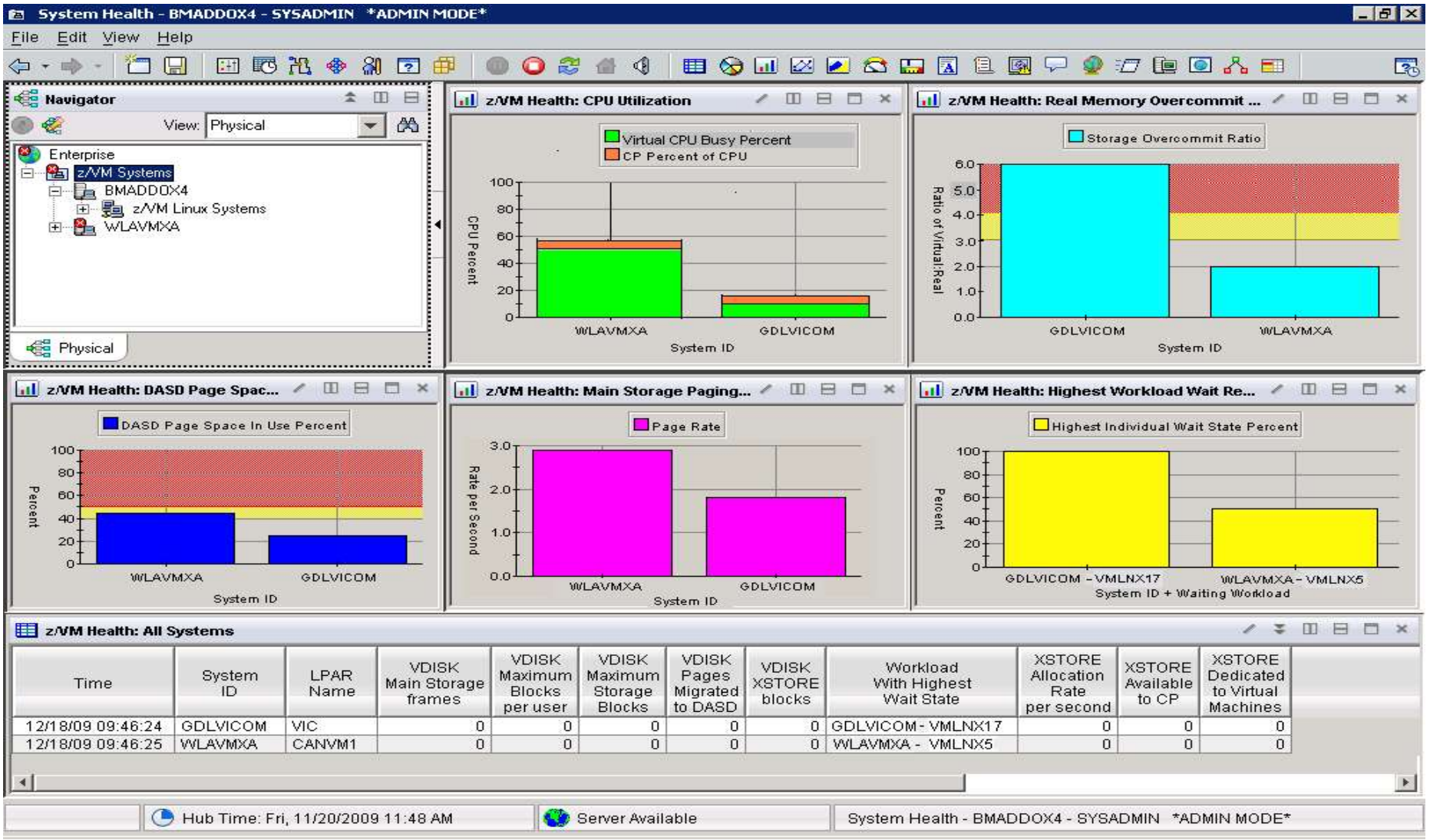
OMEGAMON XE for z/VM and Linux support

- FC MONCOLL SEGOUT ON PERFOUT
- PERFKIT does the calculations and populates the PERFOUT segment with the data that the OMEGAMON server passes on to OMEGAMON and possibly z/VM Operations Manager

OMEGAMON XE on z/VM and Linux

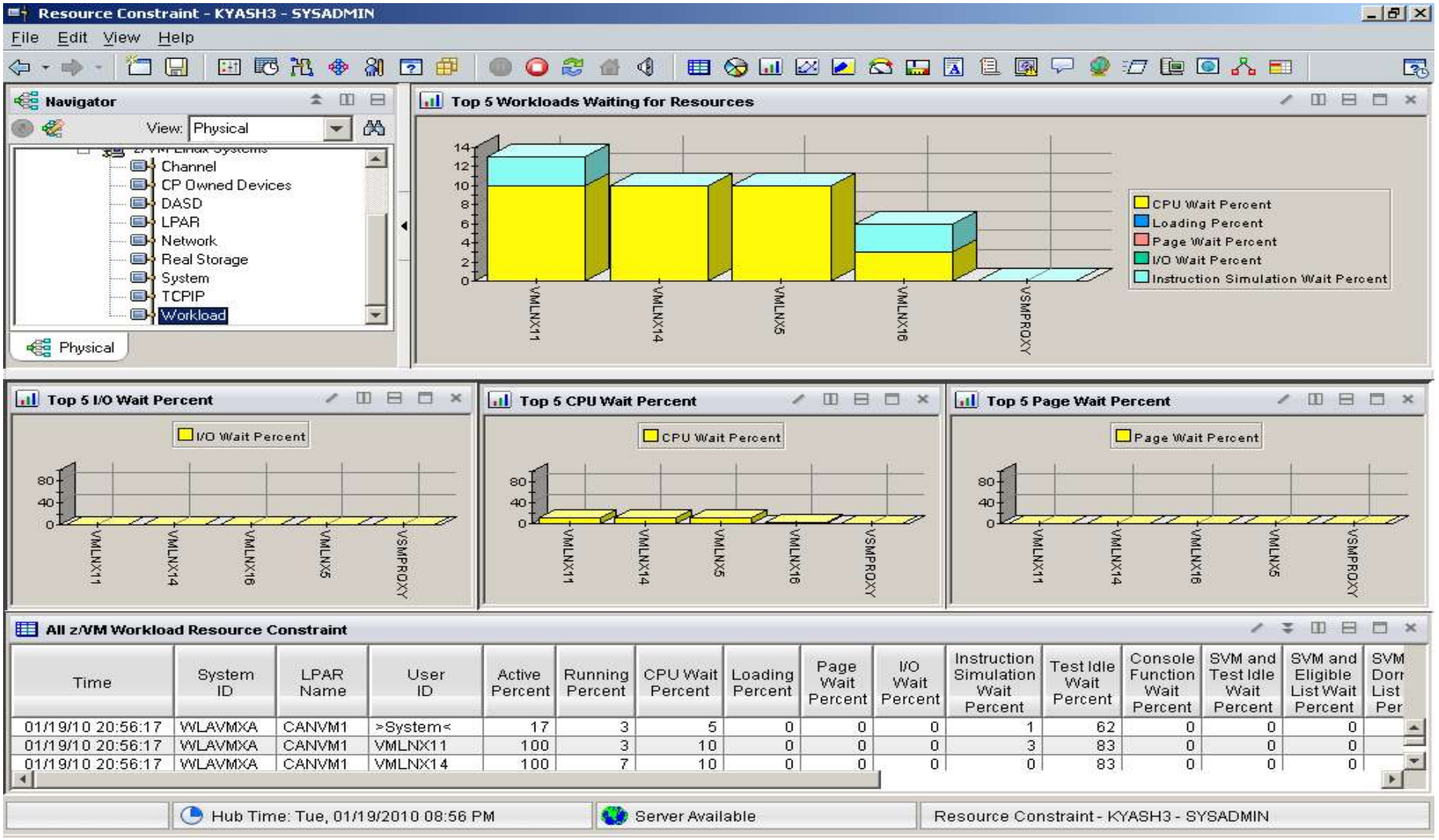
- Provides performance monitoring for z/VM and Linux guests
- Linux agents gather detailed performance data from Linux guests
- z/VM agent gathers performance data from z/VM and Linux
  - Including z/VM view of guests
  - Uses IBM Performance Toolkit as its data source
- Executes automated actions in response to defined events or situations
- Part of the Tivoli Management Services infrastructure and OMEGAMON family of products.
  - Integrates performance management for your entire enterprise
- Tivoli Data Warehouse (TDW) allows you to analyze trends and look at historical data

System Health Workspace



Time	System ID	LPAR Name	VDISK Main Storage frames	VDISK Maximum Blocks per user	VDISK Maximum Storage Blocks	VDISK Pages Migrated to DASD	VDISK XSTORE blocks	Workload With Highest Wait State	XSTORE Allocation Rate per second	XSTORE Available to CP	XSTORE Dedicated to Virtual Machines
12/18/09 09:46:24	GDLVICOM	VIC	0	0	0	0	0	GDLVICOM - VMLNX17	0	0	0
12/18/09 09:46:25	WLAVMXA	CANVM1	0	0	0	0	0	WLAVMXA - VMLNX5	0	0	0

V4.1.2 IF 1: Resource Constraint Analysis (Waits)



References

- General information
  - http://www.vm.ibm.com/related/perfkit/
- Performance Toolkit Book
  - http://publibz.boulder.ibm.com/bookmgr_OS390/libraryserver/zvmv5r3/
- Comparison to VMPRF
  - http://www.vm.ibm.com/related/perfkit/pkitprf.html
- Comparison to RTM
  - http://www.vm.ibm.com/related/perfkit/pkitrtm.html
- RMF PM setup information – page no longer available….
  - http://www-1.ibm.com/servers/eserver/zseries/zos/rmf/ rmfhtmls/pmweb/ pmlin.htm
- Redbook:
  - http://www.redbooks.ibm.com/abstracts/sg246059.html
- Whitepaper: What's new in Performance Toolkit for VM in z/VM V5.1
  - http://www.vm.ibm.com/library/gm130637.pdf