



# The Performance Toolkit in the z/VM SSI Environment

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# Agenda

- Changes to PERFSVM
- How Performance Toolkit works in an SSI cluster
- Setting up Performance Toolkit for centralized systems monitoring
- Accessing Performance Toolkit

## Changes to PERFSVM

- The pre-defined service virtual machine for the Performance Toolkit, PERFSVM has become a multi-configuration virtual machine in z/VM 6.2:
  - Defined in the user directory with an IDENTITY statement (not a USER statement).
  - Runs simultaneously on all SSI members.
  - Collects data for the member on which it is running.
- Transparent Services Access Facility (TSAF) or APPC/VTAM Support (AVS) is no longer necessary for inter-cluster Perfkit communications.
  - Uses existing ISFC cluster communications links for data transfer.

## New Reports for SSI

- A new SSI Data menu, with associated reports, has been created to support the new data and information associated with Single System Image configurations:
  - SSIMENU (FCX271)
  - SSICONF (FCX276)
  - SSISCHLG (FCX277)
  - SSISMILG (FCX278)
- And the enhanced ISFC Single System Image infrastructure:
  - ISFECONF (FCX272)
  - ISFEACT (FCX273)
  - ISFLACT (FCX274)
  - ISFLCONF (FCX275)

# Main Menu

**NEW!**



```

FCX124      Performance Screen Selection (FL620      )      Perf. Monitor
General System Data      I/O Data      History Data (by Time)
1. CPU load and trans.   11. Channel load      31. Graphics selection
2. Storage utilization   12. Control units     32. History data files*
3. SSI data menu*       13. I/O device load*  33. Benchmark displays*
4. Priv. operations     14. CP owned disks*   34. Correlation coeff.
5. System counters     15. Cache extend. func.*
6. CP IUCV services     16. Reserved          35. System summary*
7. SPOOL file display*  17. DASD seek distance*
8. LPAR data            18. I/O prior. queueing*
9. Shared segments     19. I/O configuration  36. Auxiliary storage
A. Shared data spaces   1A. I/O config. changes  37. CP communications*
B. Virt. disks in stor.
C. Transact. statistics
D. Monitor data        21. User resource usage*
E. Monitor settings   22. User paging load*
F. System settings    23. User wait states*
G. System configuration  24. User response time*
H. VM Resource Manager  25. Resources/transact.*
                       26. User communication*
                       31. System log

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

❖ Monitor data, Monitor settings, and System configuration reports have been updated to include new information.

# SSIMENU: SSI Data Menu

- The SSI Data Menu displays a selection menu of the new SSI and ISFC reports.

```

FCX271      CPU 2098  SER 2CB92      SSI data menu      Perf. Monitor

  SSI performance reports
S Command   Description
- SSICONF   SSI configuration
- SSISCHLG  SSI State Change Synchronization Activity log
- SSISMILG  SSI State/Mode Information log

  ISFC performance reports
S Command   Description
- ISFECONF  ISFC End Point configuration
- ISFEACT   ISFC End Point activity
- ISFLCONF  ISFC Logical Link configuration
- ISFLACT   ISFC Logical Link activity state
- ISFLALOG  ISFC Logical Link activity log

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

Mâ  c
  
```

# SSICONFIG: SSI Configuration



```
FCX276      CPU 2098  SER 2CB92      SSI Config.      Perf. Monitor

Initial Status on 2013/07/12 at 11:49:12
SSI Name          VMCLUST1
Number of slots configured  4
Number of slots in use     4

Members Information
Slot SystemID
  1 VMSYS1
  2 VMSYS2
  3 VMSYS3
  4 VMSYS4

Changed Config Status
Date Time      Changed
07/12 13:01:51 System VMSYS4  state: Joined -> Leaving
                          SSI mode: Stable -> Influx
07/12 13:01:51 System VMSYS4  state: Leaving -> Down
                          SSI mode: Influx
07/12 13:01:54 System VMSYS1  state: Joined

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

Mâ  c  23/015
```

- The SSI Configuration screen displays the SSI configuration of the system.

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





# SSISCHLG: SSI State Change Synchronization Activity Log

```

FCX277      CPU 2098  SER 2CB92  Interval 11:50:01 - 13:11:01      Perf. Monitor

Interval    Init  <- Count of Xmit ->  <- Sync Duration ->
End Time    Sync  PWRep  Proc  Abrt  PWRep  P&Ab  Vote
>>Mean>>   .0    .0    .0    .0    .0    .0    37107
12:51:01    0     0     0     0     0     0     0
12:52:01    0     0     0     0     0     0     0
12:53:01    0     0     0     0     0     0     0
12:54:01    0     0     0     0     0     0     0
12:55:01    0     0     0     0     0     0     0
12:56:01    0     0     0     0     0     0     0
12:57:01    0     0     0     0     0     0     0
12:58:01    0     0     0     0     0     0     0
12:59:01    0     0     0     0     0     0     0
13:00:01    0     0     0     0     0     0     0
13:01:01    0     0     0     0     0     0     0
13:02:01    1     0     0     0     0     1    3006k
13:03:01    0     0     0     0     0     0     0
13:04:01    0     0     0     0     0     0     0
13:05:01    0     0     0     0     0     0     0
13:06:01    0     0     0     0     0     0     0

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

- Displays the current SSI state change synchronization activity.

# SSISMILG: SSI State/Mode Information Log

```

FCX278      CPU 2098  SER 2CB92  Interval 11:50:01 - 13:16:01      Perf. Monitor
-----
Interval    <----- SSI State -----> <---
End Time    <-Joining--> <--Joined--> <-Leaving--> <-Isolated-> <Suspended-> <--S
Count  %Time Count  %Time Count  %Time Count  %Time Count  %Time Count
>>Mean>>    .0  .000    .0 100.00    .0  .000    .0  .000    .0  .000    .0  .000
13:01:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:02:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:03:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:04:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:05:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:06:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:07:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:08:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:09:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:10:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:11:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:12:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:13:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:14:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
13:15:01    0  .000    0 100.00    0  .000    0  .000    0  .000    0  .000
Command ===>
  
```

- SSI State section displays the cumulative number of times a state was entered and total percentage of time spent in that state.

# SSISMILG: SSI State/Mode Information Log (scroll right)

```

FCX278      CPU 2098  SER 2CB92  Interval 11:50:01 - 13:19:01  Perf. Monitor
>e -----> <----- SSI Mode ----->
Interval >--> <-Isolated-> <Suspended-> <--Stable--> <--InFlux--> <-- Safe -->
End Time >ime Count %Time Count %Time Count %Time Count %Time Count %Time
>>Mean>> >000 .0 .000 .0 .000 .0 99.942 .0 .058 .0 .000
13:01:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:02:01 .000 0 .000 0 .000 1 94.926 2 5.074 0 .000
13:03:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:04:01 .000 0 .000 0 .000 1 99.903 2 .097 0 .000
13:05:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:06:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:07:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:08:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:09:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:10:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:11:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:12:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:13:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:14:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
13:15:01 .000 0 .000 0 .000 0 100.00 0 .000 0 .000
Command ===>
  
```

- SSI Mode shows the cumulative number of times a mode was entered and the total percentage of time spent in that mode.

# ISFECONF: ISFC End Point Configuration



```
FCX272      CPU 2098  SER 2CB92      EndPoint Config.      Perf. Monitor

Initial Status on 2013/07/12 at 11:49:12
00000001 DGR BND *SYNC      ---      ---      ---      'Synchronization services
00000002 DGR BND *PLMVOTE ---      ---      ---      '
00000003 DGR BND *PLMDCSN ---      ---      ---      '
00000004 DGR BND *PLMSUSP ---      ---      ---      '
00000005 DGR BND *PLMBITM ---      ---      ---      '
00000006 DGR BND *PLMBEAT ---      ---      ---      '
00000007 LSN BND *XSCIF      ---      ---      ---      'Cross system SCIF listen'
00000008 LSN BND *QITEMS   ---      ---      ---      'Shared SPOOL et al listen
00000009 DGR BND *XDISK     ---      ---      ---      '
0000000A DGR BND *NETWORK  ---      ---      ---      'SSI Network Services'
0000000B LSN BND *LGR        ---      ---      ---      'Live Guest Relocation Lis
0000000C DGR BND *RELODOM   ---      ---      ---      'Relocation Domain Synch P
0000000D LSN BND *AT        ---      ---      ---      'AT command listen'
0000000E DGR BND *USBKES    ---      ---      ---      'USBK synchronization'
0000000F DGR BND *LXCHECK   ---      ---      ---      'LOGON cross check'
00000010 DGR BND *RPI         ---      ---      ---      '
00000013 STR CON 68940268 ---      VMSYS4   68936389 'xSCIF traffic with VMSYS4
00000014 STR CON 68940269 ---      VMSYS4   68936390 'QITEM traffic with VMSYS4

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

- Displays the ISFC end points present on this system with one row for each endpoint.



# ISFEACT: ISFC End Point Activity

**IBM**  
Performance  
Toolkit for VM

FCX273 ISFC End Point Activity (VMSYS1)

Command Refresh Systems Menu Return Logoff Help  Auto-Refresh

---

**Interval 13:32:13-13:33:13, on 2013/07/12** (CURRENT interval, select [interim](#) or [average](#) data)

EndPoint	LifeT	Sent				Received				Others		Description
		SByte	SBRat	SMsgs	SMRat	RByte	RBRat	RMsgs	RMRat	Buffd	Discd	
00000001	...	3456	57.60	24	.40	3456	57.60	24	.40	0	0	Synchronization services
00000002	...	0	.00	0	.00	0	.00	0	.00	0	0	*PLMVOTE
00000003	...	0	.00	0	.00	0	.00	0	.00	0	0	*PLMDCSN
00000004	...	0	.00	0	.00	0	.00	0	.00	0	0	*PLMSUSP
00000005	...	0	.00	0	.00	0	.00	0	.00	0	0	*PLMBITM
00000006	...	212	3.53	2	.03	636	10.60	6	.10	0	0	*PLMBEAT
00000007	...	0	.00	0	.00	0	.00	0	.00	0	0	0 Cross system SCIF listen
00000008	...	0	.00	0	.00	0	.00	0	.00	0	0	0 Shared SP00L et al listen
00000009	...	0	.00	0	.00	0	.00	0	.00	0	0	0 *XDISK
0000000A	...	0	.00	0	.00	0	.00	0	.00	0	0	0 SSI Network Services
0000000B	...	0	.00	0	.00	0	.00	0	.00	0	0	0 Live Guest Relocation Listen
0000000C	...	0	.00	0	.00	0	.00	0	.00	0	0	0 Relocation Domain Synch Port
0000000D	...	0	.00	0	.00	0	.00	0	.00	0	0	0 AT command listen
0000000E	...	0	.00	0	.00	0	.00	0	.00	0	0	0 USRBK synchronization
0000000F	...	0	.00	0	.00	0	.00	0	.00	0	0	0 LOGON cross check
00000010	...	0	.00	0	.00	0	.00	0	.00	0	0	0 *RPI
00000015	...	0	.00	0	.00	0	.00	0	.00	0	0	0 xSCIF traffic with VMSYS3
00000016	...	0	.00	0	.00	0	.00	0	.00	0	0	0 QITEM traffic with VMSYS3
00000017	...	0	.00	0	.00	0	.00	0	.00	0	0	0 xSCIF traffic with VMSYS2
00000018	...	0	.00	0	.00	0	.00	0	.00	0	0	0 QITEM traffic with VMSYS2
0000002C	1761	0	.00	0	.00	0	.00	0	.00	0	0	0 *XSCIF @VMSYS4 (STR)
0000002D	1761	0	.00	0	.00	0	.00	0	.00	0	0	0 *QITEMS @VMSYS4 (STR)

- Displays the traffic on ISFC Transport, by endpoint.

# ISFLCONF: ISFC Logical Link Configuration



```
FCX275      CPU 2098  SER 2CB92      LogLinks Config.      Perf. Monitor

Initial Status on 2013/07/12 at 11:49:12

Partner  Devs  Rdevs
VMSYS1   2    B2A1 B2A2
VMSYS3   2    B2C1 B2C2
VMSYS4   2    B2D1 B2D2

Changed Config Status
Date  Time      Changed
07/12 13:01:51  Rdev B2D1 has been deactivated for Node VMSYS4
07/12 13:01:51  Rdev B2D2 has been deactivated for Node VMSYS4 (last)
07/12 13:03:50  Rdev B2D1 has been activated for Node VMSYS4 (first)
07/12 13:03:50  Rdev B2D2 has been activated for Node VMSYS4

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

- Displays the configuration of logical links, one row per ISFC logical link.



# ISFLACT: ISFC Logical Link Activity State

```

FCX274      CPU 2098  SER 2CB92  Interval 13:41:01 - 13:42:01  Perf. Monitor
-----
Partner  Devs  <----- Sent -----> <----- Received ----->
LSByte  LSBRt  LSMsg  LSMR  LRByte  LRBrt  LRMsg  LRMR
VMSYS1   2.0    2568  42.80   15   .25   2988  49.80   15   .25
VMSYS3   2.0    2412  40.20   14   .23   2804  46.73   14   .23
VMSYS4   2.0    2412  40.20   14   .23   2804  46.73   14   .23

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

- Shows ISFC logical link transport activity.

# ISFLALOG: ISFC Logical Link Activity By Time Log

```

FCX281      CPU 2098  SER 2CB92  Interval 11:50:01 - 15:08:01  Perf. Monitor

Interval
End Time Partner  Devs  <----- Sent -----> <----- Received ----->
>>Mean>> VMSYS1    2.0  498755 41.98  2949  .25  581290 48.93  2952  .25
>>Mean>> VMSYS3    2.0  501944 42.25  2968  .25  584946 49.24  2968  .25
>>Mean>> VMSYS4    2.0  569209 47.91  3306  .28  671773 56.55  3377  .28

15:05:01 VMSYS4    2.0    2078 34.63    12  .20    2414 40.23    12  .20

15:06:01 VMSYS1    2.0    2412 40.20    14  .23    2804 46.73    14  .23
15:06:01 VMSYS3    2.0    2412 40.20    14  .23    2804 46.73    14  .23
15:06:01 VMSYS4    2.0    2412 40.20    14  .23    2804 46.73    14  .23

15:07:01 VMSYS1    2.0    2078 34.63    12  .20    2414 40.23    12  .20
15:07:01 VMSYS3    2.0    2078 34.63    12  .20    2414 40.23    12  .20
15:07:01 VMSYS4    2.0    2234 37.23    13  .22    2598 43.30    13  .22

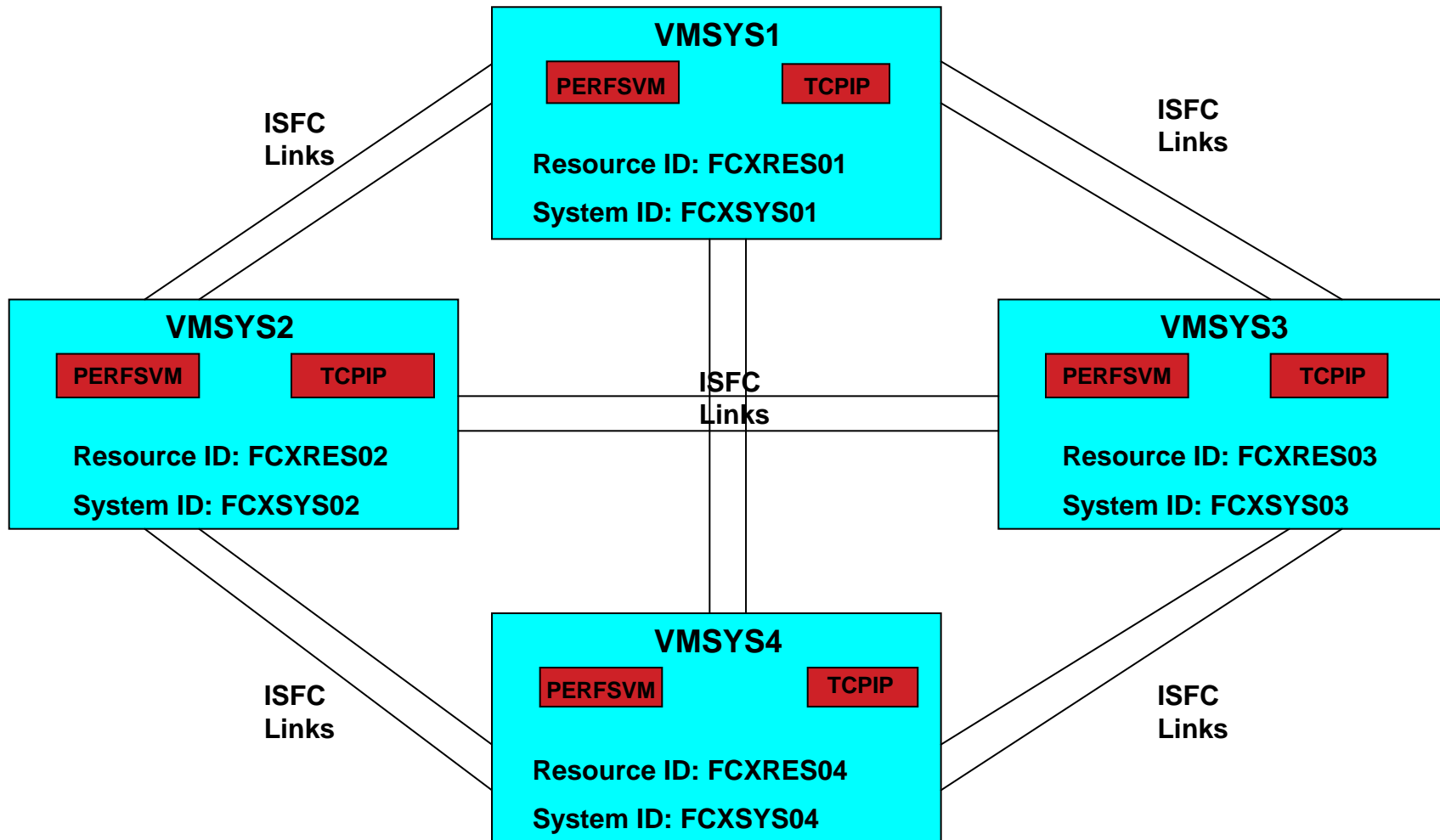
15:08:01 VMSYS1    2.0    2412 40.20    14  .23    2804 46.73    14  .23
15:08:01 VMSYS3    2.0    2412 40.20    14  .23    2804 46.73    14  .23
15:08:01 VMSYS4    2.0    2412 40.20    14  .23    2804 46.73    14  .23

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

- Displays overall performance data for all ISFC Logical Links in the system, by time.



# How Performance Toolkit works in an SSI cluster



# Setting up Performance Toolkit for Centralized Systems Monitoring

- Enable Performance Toolkit.
- Place service into production on each node.
- Identify the unique global system and resource ids for each node in the user directory.
- Create or update the following files on the 191 disk of each PERFSVM instance in the cluster:
  - PROFILE EXEC
  - FCONX \$PROFILE
  - UCOMDIR NAMES
  - FCONRMT AUTHORIZ
  - FCONRMT SYSTEMS
- Update the PROFILE TCPIP for each TCPIP server instance in the cluster.
- Update the PROFILE EXEC for each AUTOLOG1 server instance in the cluster.

## Enable Performance Toolkit

- The Performance Toolkit is a priced optional, pre-installed feature of z/VM so it must be enabled before it can be used. To enable Performance Toolkit, issue the following command from the MAINT620 (or MAINTVRL of the system you are on) userid:

### **SERVICE PERFTK ENABLE**

- You will only need to enter this command once on any one of the SSI cluster member systems.

# Place enabled product into production on each node

- Performance Toolkit is put into production separately on each SSI member node, so you will need to issue the following command from MAINT620 on **EVERY** system in the cluster:

## PUT2PROD

- In the example 4-node SSI cluster, PUT2PROD was run 4 times.

## Identify the unique global system and resource ids for each node in the directory

- In the user directory entry for PERFSVM, IUCV statements are added to create a unique pair of APPC resource names (System ID and Resource ID) for each SSI member's PerfKit instance.
  - They are assigned in the common section of PERFSVM's IDENTITY statement.
- IUCV ALLOW statement authorizes users to establish an APPC/VM connection to the resources managed by PERFSVM.

# USER DIRECT Entry for PERFSVM (unchanged from installation)

```
USER      DIRECT      C1  F 80  Trunc=72 Size=4689 Line=3786 Col=1 Alt=0
03786  IDENTITY PERFSVM  PERFSVM  128M  512M ABDEG
03787  BUILD ON VMSYS1 USING SUBCONFIG PERFSV-1
03788  BUILD ON VMSYS2 USING SUBCONFIG PERFSV-2
03789  BUILD ON VMSYS3 USING SUBCONFIG PERFSV-3
03790  BUILD ON VMSYS4 USING SUBCONFIG PERFSV-4
03791  MACHINE ESA
03792  XAUTOLOG AUTOLOG1
03793  ACCOUNT XXXXX
03794  NAMESAVE MONDCSS
03795  IUCV *MONITOR MSGLIMIT 255
03796  IUCV *IDENT FCXC1R01 GLOBAL
03797  IUCV *IDENT FCXC1S01 GLOBAL
03798  IUCV *IDENT FCXC1R02 GLOBAL
03799  IUCV *IDENT FCXC1S02 GLOBAL
03800  IUCV *IDENT FCXC1R03 GLOBAL
03801  IUCV *IDENT FCXC1S03 GLOBAL
03802  IUCV *IDENT FCXC1R04 GLOBAL
03803  IUCV *IDENT FCXC1S04 GLOBAL
03804  IUCV ALLOW
03805  SHARE ABS 3%
03806  IPL CMS PARM AUTOCR
```

- A 4 member SSI Installation generated these IUCV statements automatically.

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

# User Directory Updates

- In the 4 member cluster example, the nine **highlighted** directory statements establish the global system and resource ids for each node in the cluster and allow users to connect with those resources:

```
IDENTITY PERFSVM PERFSVM 128M 512M ABDEG
BUILD ON VMSYS1 USING SUBCONFIG PERFSV-1
BUILD ON VMSYS2 USING SUBCONFIG PERFSV-2
BUILD ON VMSYS3 USING SUBCONFIG PERFSV-3
BUILD ON VMSYS4 USING SUBCONFIG PERFSV-4
MACHINE ESA
XAUTOLOG AUTOLOG1
ACCOUNT XXXXX
NAMESAVE MONDCSS
IUCV *MONITOR MSGLIMIT 255
IUCV *IDENT FCXRES01 GLOBAL
IUCV *IDENT FCXSYS01 GLOBAL
IUCV *IDENT FCXRES02 GLOBAL
IUCV *IDENT FCXSYS02 GLOBAL
IUCV *IDENT FCXRES03 GLOBAL
IUCV *IDENT FCXSYS03 GLOBAL
IUCV *IDENT FCXRES04 GLOBAL
IUCV *IDENT FCXSYS04 GLOBAL
IUCV ALLOW
SHARE ABS 3%
IPL CMS PARM AUTOCR
```

# USER DIRECT entry for PERFSVM (updated for example)

```
USER          DIRECT      C1  F 80  Trunc=72  Size=4689  Line=3786  Col=1  Alt=0

03786 IDENTITY PERFSVM  PERFSVM   128M   512M ABDEG
03787  BUILD ON VMSYS1 USING SUBCONFIG PERFSV-1
03788  BUILD ON VMSYS2 USING SUBCONFIG PERFSV-2
03789  BUILD ON VMSYS3 USING SUBCONFIG PERFSV-3
03790  BUILD ON VMSYS4 USING SUBCONFIG PERFSV-4
03791  MACHINE ESA
03792  XAUTOLOG AUTOLOG1
03793  ACCOUNT XXXXX
03794  NAMESAVE MONDCSS
03795  IUCV *MONITOR MSGLIMIT 255
03796  IUCV *IDENT FCXRES01 GLOBAL
03797  IUCV *IDENT FCXSYS01 GLOBAL
03798  IUCV *IDENT FCXRES02 GLOBAL
03799  IUCV *IDENT FCXSYS02 GLOBAL
03800  IUCV *IDENT FCXRES03 GLOBAL
03801  IUCV *IDENT FCXSYS03 GLOBAL
03802  IUCV *IDENT FCXRES04 GLOBAL
03803  IUCV *IDENT FCXSYS04 GLOBAL
03804  IUCV ALLOW
03805  SHARE ABS 3%
03806  IPL CMS PARM AUTOOCR
```

- I updated the system and resource id's to match my example system.



## PERFSVM's PROFILE EXEC

- PERFSVM's PROFILE EXEC is used to enable the collection of CP MONITOR records through the MONITOR command. Remove the comments from the CP MONITOR commands in PROFILE EXEC to enable data collection at PERFSVM startup.
  - Although the contents of the sample PROFILE EXEC will work fine, you may want to use an alternative set of MONITOR commands, or adjust them according to your system monitoring requirements.
- The PROFILE EXEC must be updated on **each** instance of PERFSVM running in the cluster.

# PERFSVM unchanged PROFILE EXEC

```

PROFILE EXEC      A2  V 130  Trunc=130 Size=71 Line=53 Col=1 Alt=0

===== /*** Once you have PERFKIT enabled and running uncomment the      *** /
===== /*** following comments                                           *** /
===== /* 'CP MONITOR SAMPLE ENABLE PROCESSOR'                          */
===== /* 'CP MONITOR SAMPLE ENABLE STORAGE'                             */
===== /* 'CP MONITOR SAMPLE ENABLE USER ALL'                           */
===== /* 'CP MONITOR SAMPLE ENABLE I/O ALL'                             */
===== /* 'CP MONITOR SAMPLE ENABLE NETWORK'                             */ /*@F1153MP*/
===== /* 'CP MONITOR SAMPLE ENABLE APPLDATA ALL'                       */
===== /* 'CP MONITOR SAMPLE ENABLE ISFC'                               */ /*@F1153MP*/
===== /* 'CP MONITOR SAMPLE ENABLE SSI'                                 */ /*@F1153MP*/
===== /* 'CP MONITOR EVENT ENABLE STORAGE'                             */
===== /* 'CP MONITOR EVENT ENABLE I/O ALL'                             */
===== /* 'CP MONITOR EVENT ENABLE NETWORK'                             */ /*@F1153MP*/
===== /* 'CP MONITOR EVENT ENABLE ISFC'                               */ /*@F1153MP*/
===== /* 'CP MONITOR EVENT ENABLE SSI'                                 */ /*@F1153MP*/
=====
===== 'PERFKIT' /* Invoke the PERFKIT module @FC012BD*/
=====
===== Exit
===== * * * End of File * * *
=====> _
X E D I T 1 File

```

# Recommended PROFILE EXEC for PERFSVM

The advantage of using the following example instead of the commands in the default PROFILE EXEC is that it enables the collection of all MONITOR domains. In the event that new domains are added in the future, this set of commands will collect them without requiring modification.

In the event that you wish to adjust and/or experiment with sampling rates or data collection intervals in the future, both the command syntax and default values are clearly displayed.

```

/** Once you have PERFKIT enabled and running uncomment the */
/** following comments */
'CP MONITOR SAMPLE RATE 2 SEC' /* DEFAULT 2 SECONDS */
'CP MONITOR SAMPLE INTERVAL 1 MIN' /* DEFAULT 1 MINUTE */
'CP MONITOR SAMPLE ENABLE ALL' }
'CP MONITOR EVENT ENABLE ALL' }
/* SCHEDULER NOT NECESSARY UNLESS REQUESTED BY DEVELOPMENT */
'CP MONITOR EVENT DISABLE SCHEDULER ALL' }
/* SEEKS NOT NECESSARY - LOTS OF USELESS DATA */ }
'CP MONITOR EVENT DISABLE SEEKS ALL'

'PERFKIT' /* Invoke the PERFKIT module @FC012BD*/
  
```

These commands insure all valuable data is collected and all unnecessary data collection is turned off.

Exit

# PERFSVM'S Recommended PROFILE EXEC



```
PROFILE EXEC      A2  V 130  Trunc=130 Size=64 Line=53 Col=1 Alt=0
=====
**** Once you have PERFKIT enabled and running uncomment the      ****/
**** following comments                                           ****/
**** 'CP MONITOR SAMPLE RATE 2 SEC'                               /* DEFAULT 2 SECONDS */
**** 'CP MONITOR SAMPLE INTERVAL 1 MIN'                           /* DEFAULT 1 MINUTE  */
**** 'CP MONITOR SAMPLE ENABLE ALL'
**** 'CP MONITOR EVENT  ENABLE ALL'
**** 'CP MONITOR EVENT  DISABLE SCHEDULER ALL'
**** 'CP MONITOR EVENT  DISABLE SEEKS'                             /*@F1153MP*/
=====
**** 'PERFKIT'                                                     /* Invoke the PERFKIT module  @FC012BD*/
=====
**** Exit
**** * * * End of File * * *
```

# Update FCONX \$PROFILE

- PERFSVM's FCONX \$PROFILE must be updated to enable the Virtual Machine Communications Facility (VMCF) and the PerfKit web server.
  - A sample FCONX \$PROFILE can be found on the PERFSVM's1CC minidisk.
  - Copy the sample to PERFSVM's 191 minidisk as FCONX \$PROFILE and uncomment the two "FC MONCOLL" commands highlighted in red, in the example below.

```
*      Following command activates VMCF data retrieval interface
FC MONCOLL VMCF ON
*      Define the maximum allowed number of Internet connections
*C MONCOLL WEBSERV MAXCONN 100
*      Define the timeout of inactive Internet connections in
minutes
*C MONCOLL WEBSERV TIMEOUT 30
*      Following command activates Internet interface
FC MONCOLL WEBSERV ON TCPIP TCPIP 81
*      Following command activates Internet interface with SSL
*C MONCOLL WEBSERV ON SSL TCPIP TCPIP 81
```

- This update must be made on EVERY instance of PERFSVM in the cluster.

# FCONX \$PROFILE unchanged



```
FCONX      $PROFILE D1  F 80  Trunc=80 Size=452 Line=189 Col=1 Alt=0
```

```
=====*      Following command activates VMCF data retrieval interface
=====*C MONCOLL VMCF ON
=====*      Define the maximum allowed number of Internet connections
=====*C MONCOLL WEBSERV MAXCONN 100
=====*      Define the timeout of inactive Internet connections in minutes
=====*C MONCOLL WEBSERV TIMEOUT 30
=====*      Following command activates Internet interface
=====*C MONCOLL WEBSERV ON TCPIP TCPIP 81
=====*      Following command activates Internet interface with SSL
=====*C MONCOLL WEBSERV ON SSL TCPIP TCPIP 81
=====*      Following command activates TCP/IP interface for data retrieval
=====*      from LINUX RMF DDS interface
=====*C MONCOLL LINUXUSR ON TCPIP TCPIP
=====*
=====*-----*
=====*      Activate the Emergency Safeguard Feature (ESF) of PERFKIT
=====*-----*
=====*      Define the actions to be performed at the emergency event
=====*C EMERGENC EXECPROC MYPROC
=====*C EMERGENC ORDER EXECPROC PRINT INTERIM TREND SUMMARY REMPRINT
=====>
```

```
X E D I T 1 File
```

# FCONX \$PROFILE Updated



```
FCONX      $PROFILE D1  F 80  Trunc=80  Size=452  Line=189  Col=1  Alt=2
===== *      Following command activates VMCF data retrieval interface
-----> FC MONCOLL VMCF ON
===== *      Define the maximum allowed number of Internet connections
===== *C MONCOLL WEBSERV MAXCONN 100
===== *      Define the timeout of inactive Internet connections in minutes
===== *C MONCOLL WEBSERV TIMEOUT 30
===== *      Following command activates Internet interface
-----> FC MONCOLL WEBSERV ON TCPIP TCPIP 81
===== *      Following command activates Internet interface with SSL
===== *C MONCOLL WEBSERV ON SSL TCPIP TCPIP 81
===== *      Following command activates TCP/IP interface for data retrieval
===== *      from LINUX RMF DDS interface
===== *C MONCOLL LINUXUSR ON TCPIP TCPIP
===== *
===== *
-----
===== *      Activate the Emergency Safeguard Feature (ESF) of PERFKIT
===== *
-----
===== *      Define the actions to be performed at the emergency event
===== *C EMERGENC EXECPROC MYPROC
===== *C EMERGENC ORDER EXECPROC PRINT INTERIM TREND SUMMARY REMPRINT
=====>
```

-Statements are activated by replacing the \* (asterisk) in column 1 with an 'F' which uncomments the line and completes the command.

-Take note of the Port Number being used on the WEBSERV command (81).

-If using an SSL secure web server connection, be sure to uncomment the correct "FC MONCOLL" statement for the SSL web server.

# UCOMDIR NAMES

- The UCOMDIR NAMES file is created for each PERFSVM instance to identify each of the VM nodes in the cluster and their unique resource identifier.
- For each instance of PERFSVM, create a UCOMDIR NAMES file on PERFSVM's 191 disk.

## VMSYS1: UCOMDIR NAMES

```
:nick.FCXRES00      :luname.*IDENT
                    :tpn.FCXRES01
                    :security.SAME
:nick.FCXSYSTEM     :luname.*IDENT
                    :tpn.FCXSYS01
                    :security.SAME
```

## VMSYS2: UCOMDIR NAMES

```
:nick.FCXRES00.    :luname.*IDENT
                    :tpn.FCXRES02
                    :security.SAME
:nick.FCXSYSTEM.   :luname.*IDENT
                    :tpn.FXCSYS02
                    :security.SAME
```

## VMSYS3: UCOMDIR NAMES

```
:nick.FCXRES00      :luname.*IDENT
                    :tpn.FCXRES03
                    :security.SAME
:nick.FCXSYSTEM     :luname.*IDENT
                    :tpn.FCXSYS03
                    :security.SAME
```

## VMSYS4: UCOMDIR NAMES

```
:nick.FCXRES00.    :luname.*IDENT
                    :tpn.FXCRES04
                    :security.SAME
:nick.FCXSYSTEM.   :luname.*IDENT
                    :tpn.FXCSYS04
                    :security.SAME
```



# UCOMDIR NAMES – VMSYS1 PERFSVM

```
UCOMDIR  NAMES      A1  V 255  Trunc=255  Size=6  Line=0  Col=1  Alt=26

==== * * * Top of File * * *
==== :nick.FCXRES00      :luname.*IDENT
====                               :tpn.FCXRES01
====                               :security.SAME
==== :nick.FCXSYSTEM    :luname.*IDENT
====                               :tpn.FCXSYS01
====                               :security.SAME
==== _
==== * * * End of File * * *

====>

X E D I T  1
```

- One of these files was created on each PERFSVM's 191 disk. Only the content of the :tpn. tag was changed to match the resource and system ids for that member.

# FCONRMT AUTHORIZ for PERFSVM 191

The FCONRMT AUTHORIZ file must be created to identify local and remote users allowed to view data, execute commands, and view exception messages from PerfKit. The file should be placed on PERFSVMs 191 minidisk.

**FCONRMT AUTHORIZ is used to authorize both APPC/VM and VMCF (if enabled) connections.**

**Wild cards are allowed in both the NODE-ID and USER-ID fields.**

**The PERFSVM userid on each node in the cluster must be authorized. Other userids can be added as required.**

```
* AUTHORIZATION FILE FOR LOCAL AND REMOTE DATA RETRIEVAL
* AND COMMAND EXECUTION
* NODE-ID  USER-ID          AUTHORIZED FOR
VMSYS1    PERFSVM  S&FSERV  DATA CMD
VMSYS2    PERFSVM  S&FSERV  DATA CMD
VMSYS3    PERFSVM  S&FSERV  DATA CMD
VMSYS4    PERFSVM  S&FSERV  DATA CMD
VMSYS1    MAINT      DATA
VMSYS2    MAINT      DATA
VMSYS3    MAINT      DATA
VMSYS4    MAINT      DATA
VMSYS1    MAINT620   DATA
VMSYS2    MAINT620   DATA
VMSYS3    MAINT620   DATA
VMSYS4    MAINT620   DATA
```

# FCONRMT AUTHORIZ for PERFSVM 191

```
FCONRMT  AUTHORIZ A1  F 80  Trunc=80  Size=15  Line=0  Col=1  Alt=0

===== * * * Top of File * * *
===== * AUTHORIZATION FILE FOR LOCAL AND REMOTE DATA RETRIEVAL
===== * AND COMMAND EXECUTION
===== * NODE-ID   USER-ID           AUTHORIZED FOR
=====   VMSYS1   PERFSVM       S&FSERV      DATA CMD
=====   VMSYS2   PERFSVM       S&FSERV      DATA CMD
=====   VMSYS3   PERFSVM       S&FSERV      DATA CMD
=====   VMSYS4   PERFSVM       S&FSERV      DATA CMD
=====   VMSYS1   MAINT          DATA
=====   VMSYS2   MAINT          DATA
=====   VMSYS3   MAINT          DATA
=====   VMSYS4   MAINT          DATA
=====   VMSYS1   MAINT620      DATA
=====   VMSYS2   MAINT620      DATA
=====   VMSYS3   MAINT620      DATA
=====   VMSYS4   MAINT620      DATA
===== * * * End of File * * *

===== >
```

- An identical copy of this file was placed on the 191 disk of every PERFSVM server in the cluster.

## FCONRMT SYSTEMS on PERFSVM 191

- The FCONRMT SYSTEMS file must be created to identify each of the VM nodes in the cluster and their unique resource identifiers. The file should be placed on PERFSVM's 191 minidisk on each member.

* NODEID	USERID	Release	N	ResourceID
VMSYS1	PERFSVM	ZVM6.2	N	FCXRES01
VMSYS2	PERFSVM	ZVM6.2	N	FCXRES02
VMSYS3	PERFSVM	ZVM6.2	N	FCXRES03
VMSYS4	PERFSVM	ZVM6.2	N	FCXRES04

# FCONRMT SYSTEMS for PERFSVM 191

```
FCONRMT  SYSTEMS  A1  F 80  Trunc=80  Size=5  Line=0  Col=1  Alt=0

===== * * * Top of File * * *
===== * NODEID  USERID  Release  N  ResourceID
=====   VMSYS1  PERFSVM  ZVM6.2   N  FCXRES01
=====   VMSYS2  PERFSVM  ZVM6.2   N  FCXRES02
=====   VMSYS3  PERFSVM  ZVM6.2   N  FCXRES03
=====   VMSYS4  PERFSVM  ZVM6.2   N  FCXRES04
===== * * * End of File * * *
```

- An identical copy of this file was placed on the 191 disk of every PERFSVM server in the cluster.

# Update PROFILE TCPIP for Webserver Connections

- VM TCPIPs PROFILE TCPIP must be updated to enable a port for the Performance Toolkit's HTTP server to monitor.
- The default HTTP server port is port 80, but any unused port will work.
  - Use the same port number as you coded on the "FC MONCOLL" statement in the FCONX \$PROFILE file.

```
PORT
  20  TCP FTPSERVE  NOAUTOLOG ; FTP Server
  21  TCP FTPSERVE                ; FTP Server
  23  TCP INTCLIEN                ; TELNET Server
  25  TCP SMTP                    ; SMTP SERVER
; 67  UDP DHCPD                   ; DHCP Server
  81  TCP PERFSVM NOAUTOLOG      ; PERFORMANCE TOOLKIT HTTP SERVER
...
...
; (End of PORT reservations)
```

# PROFILE TCPIP on TCPMAINT'S 198 Updated

This must be the same port number used in FCONX \$PROFILE

```

PROFILE TCPIP D1 V 80 Trunc=80 Size=58 Line=16 Col=1 Alt=0
=====
PORT
===== ; 20 TCP FTPSERVE NOAUTOLOG ; FTP Server
===== ; 21 TCP FTPSERVE ; FTP Server
===== ; 23 TCP INTCLIEN ; TELNET Server
===== ; 25 TCP SMTP ; SMTP Server
===== ; 67 UDP DHCPD ; DHCP Server
===== ; 81 TCP PERFSVM NOAUTOLOG ; Performance Toolkit Webserver
===== ; 111 TCP PORTMAP ; Portmap Server
===== ; 111 UDP PORTMAP ; Portmap Server
===== ; 143 TCP IMAP ; IMAP Server
===== ; 161 UDP SNMPD ; SNMP Agent
===== ; 162 UDP SNMPQE ; SNMPQE Agent
===== ; 389 TCP LDAPSRV ; LDAP Server
===== ; 389 UDP LDAPSRV ; LDAP Server
===== ; 512 TCP REXECD ; REXECD Server (REXEC)
===== ; 514 TCP REXECD ; REXECD Server (RSH)
===== ; 515 TCP LPSERVE ; LP Server
===== ; 520 UDP MPROUTE NOAUTOLOG ; Multiple Protocol Routing Server
===== ; 608 TCP UFTD ; UFT Server
===== ; 636 TCP LDAPSRV ; LDAP Server (Secure)
===== >

```

- This file is updated on every instance of TCPMAINT in the cluster. TCPIP service machines need to be recycled to pick up this change.

## Update AUTOLOG1's PROFILE EXEC

- The PROFILE EXEC on the 191 disk of each instance of AUTOLOG1 in the cluster should be updated to include the automatic startup of the local PERFSVM instance.



# Accessing Performance Toolkit

- **If you have configured all PERFSVM servers to communicate with each other, you can access the data for any server, from any server, through the usual Performance Toolkit interfaces:**
  - **Logon directly to any PERFSVM server in the cluster and select the server you want to access through the APPC/VM interface.**
  - **Use the Web Browser interface to interact with any PERFSVM server in the cluster.**
- **You can still interact with a PERFSVM server through the VMCF interface if you are on the same system as the server. Remote system access is not available through this interface.**

# The APPC/VM Remote System Interface

- With the example configuration, you can use the APPC/VM interface to access performance data for any system in the cluster from a single PERFSVM userid on any of the member systems.
  - Logon to PERFSVM on one of the member systems. Perfkit will display the BASIC mode screen. To view a list of systems available, enter the following command on Basic menu command line:  
**FCONAPPC FCXSYSTEM**
  - Each system nodeid is displayed if the system is up and the PERFSVM server is running. The system can be selected by moving the cursor to the nodeid and pressing ENTER or typing the nodeid on the command line.

## The APPC/VM Remote System Interface (*cont*)

- If you are logged on to an authorized userid (like MAINT620 in this example), you can also use the APPC/VM interface to look at performance data from any of the systems.
  - LINK PERFSVM 201 999 RR
  - ACCESS 999 Z
  - PERFKIT
- This will display the BASIC mode screen, just like you would see if you logged on to PERFSVM directly. Then you can use the APPC/VM interface command to look at a specific system's data by including the Resource Identifier of that system in the command:
  - FCONAPPC FCXRES03            (if you want to look at VMSYS3 data)

# APPC/VM Remote System Monitoring Session



```
FCX198      Performance Toolkit Remote Monitoring Facility      VMSYS2

Node-ID     Time      ----- Exceptions & CPU Load -----> AvExcp
VMSYS1     12:00    none                                     :      0
VMSYS2     12:00    none                                     :      0
VMSYS3     12:00    none                                     :      0
VMSYS4     12:00    none                                     :      0

Select the system to be monitored
Command ==> _
F1=Help  F4=Top  F5=Bot  F7=Bkwd  F8=Fwd  F12=Return
```

- This picture was taken from PERFSVM on VMSYS2. It would look the same on any of the other member systems.



# APPC/VM Remote Session

```

FCX124          Performance Screen Selection (FL620          )          VMSYS3

General System Data          I/O Data          History Data (by Time)
1. CPU load and trans.      11. Channel load          31. Graphics selection
2. Storage utilization      12. Control units        32. History data files*
3. SSI data menu*          13. I/O device load*     33. Benchmark displays*
4. Priv. operations         14. CP owned disks*     34. Correlation coeff.
5. System counters         15. Cache extend. func.* 35. System summary*
6. CP IUCV services        16. Reserved            36. Auxiliary storage
7. SP00L file display*     17. DASD seek distance* 37. CP communications*
8. LPAR data               18. I/O prior. queueing* 38. DASD load
9. Shared segments         19. I/O configuration    39. Minidisk cache*
A. Shared data spaces      1A. I/O config. changes  3A. Storage mgmt. data*
B. Virt. disks in stor.    21. User resource usage* 3B. Proc. load & config*
C. Transact. statistics    22. User paging load*    3C. Logical part. load
D. Monitor data           23. User wait states*    3D. Response time (all)*
E. Monitor settings        24. User response time*  3E. RSK data menu*
F. System settings         25. Resources/transact.* 3F. Scheduler queues
G. System configuration    26. User communication*  3G. Scheduler data
H. VM Resource Manager     3H. SFS/BFS logs menu*
                            3I. System log

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

- VMSYS3 was selected on the previous menu. This is also what you would see if you issued the commands in the example for viewing data from MAINT620, shown on a previous chart.

# The Web Server Remote System Interface

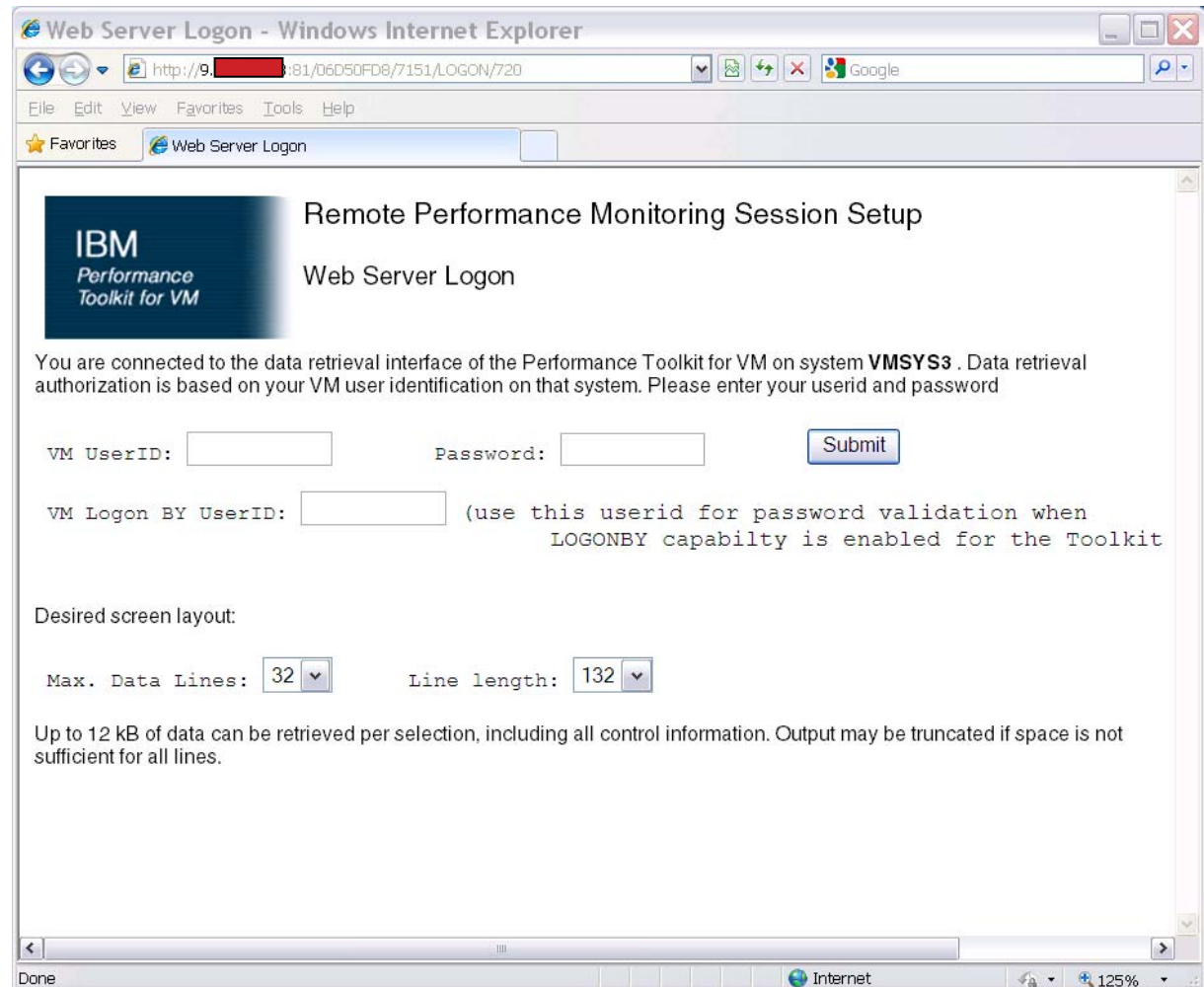
- To access the Performance Toolkit's web server interface, open a web browser and point it to the ipaddress of the system it is running on, plus the port number that you defined in PROFILE TCPIP.

<http://xxx.xxx.xxx.xxx:81>

- You will be shown web server logon screen.

# Web Server Logon

- You must provide a valid userid and password from the VM system.
- You can change the size of the screen display here.



Web Server Logon - Windows Internet Explorer

http://9.181.06D50FD8/7151/LOGON/720

File Edit View Favorites Tools Help

Web Server Logon

**IBM**  
Performance  
Toolkit for VM

## Remote Performance Monitoring Session Setup

### Web Server Logon

You are connected to the data retrieval interface of the Performance Toolkit for VM on system **VMSYS3**. Data retrieval authorization is based on your VM user identification on that system. Please enter your userid and password

VM UserID:  Password:

VM Logon BY UserID:  (use this userid for password validation when LOGONBY capability is enabled for the Toolkit)

Desired screen layout:

Max. Data Lines:  Line length:

Up to 12 kB of data can be retrieved per selection, including all control information. Output may be truncated if space is not sufficient for all lines.

Done Internet 125%

# Central Monitoring System Load Overview Screen



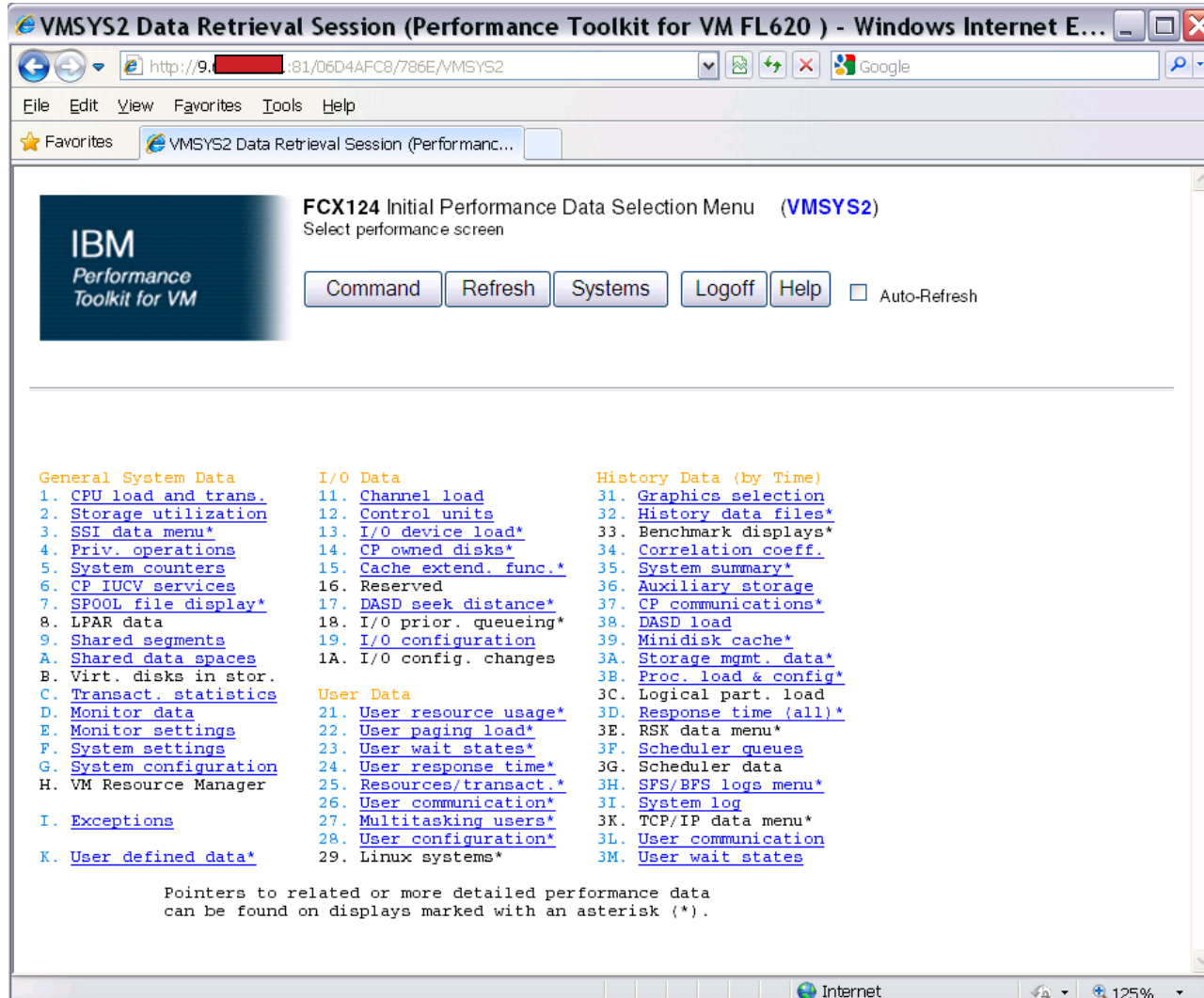
Click on the system you want to monitor.

Node-ID	Time	Exceptions & CPU Load	AvExcp
<a href="#">VMSYS1</a>	12:22	none	0
<a href="#">VMSYS2</a>	12:22	none	0
<a href="#">VMSYS3</a>	12:22	none	0
<a href="#">VMSYS4</a>	12:22	none	0

A valid userid and password on VMSYS3 will get you to this screen, but it will not allow you to display any of these systems' performance screens unless you were authorized in FCONRMT AUTHORIZ for that system.



# Initial Performance Data Selection Menu from the Web Interface



VMSYS2 Data Retrieval Session (Performance Toolkit for VM FL620) - Windows Internet E...

http://9.181.06D4AFCB/786E/VMSYS2

File Edit View Favorites Tools Help

★ Favorites VMSYS2 Data Retrieval Session (Performanc...

**IBM**  
Performance Toolkit for VM

**FCX124 Initial Performance Data Selection Menu (VMSYS2)**  
Select performance screen

Command Refresh Systems Logoff Help  Auto-Refresh

---

**General System Data**

1. CPU load and trans.
2. Storage utilization
3. SSI data menu\*
4. Priv. operations
5. System counters
6. CP IUCV services
7. SPOOL file display\*
8. LPAR data
9. Shared segments
- A. Shared data spaces
- B. Virt. disks in stor.
- C. Transact. statistics
- D. Monitor data
- E. Monitor settings
- F. System settings
- G. System configuration
- H. VM Resource Manager
- I. Exceptions
- K. User defined data\*

**I/O Data**

11. Channel load
12. Control units
13. I/O device load\*
14. CP owned disks\*
15. Cache extend. func.\*
16. Reserved
17. DASD seek distance\*
18. I/O prior. queueing\*
19. I/O configuration
- 1A. I/O config. changes

**User Data**

21. User resource usage\*
22. User paging load\*
23. User wait states\*
24. User response time\*
25. Resources/transact.\*
26. User communication\*
27. Multitasking users\*
28. User configuration\*
29. Linux systems\*

**History Data (by Time)**

31. Graphics selection
32. History data files\*
33. Benchmark displays\*
34. Correlation coeff.
35. System summary\*
36. Auxiliary storage
37. CP communications\*
38. DASD load
39. Minidisk cache\*
- 3A. Storage mgmt. data\*
- 3B. Proc. load & config\*
- 3C. Logical part. load
- 3D. Response time (all)\*
- 3E. RSK data menu\*
- 3F. Scheduler queues
- 3G. Scheduler data
- 3H. SPS/BPS logs menu\*
- 3I. System log
- 3K. TCP/IP data menu\*
- 3L. User communication
- 3M. User wait states

Pointers to related or more detailed performance data can be found on displays marked with an asterisk (\*).

Internet 125%

## Summary

- The Performance Toolkit has been updated to support system performance monitoring in an SSI environment:
  - Using the same configuration files and interfaces as a non-SSI environment
  - Without needing TSAF or AVS for inter-cluster communications
  - With additional reports for cluster and ISFC link configuration and performance.

