

Power Systems Virtualisation from IBM - Technical Webinar User Group

IBM
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Today

31th → **Whole POWER Machine Monitoring**
Starting at 10:00 am UK time by Nigel Griffiths



Smart Meeting → Put questions into the Chat box
or AT&T Toll Free phone for better audio

- 0800-368-0638 = UK Toll Free
- 0203-059-6451 = UK but you pay for the call
- Then 6403785# Participant Code
- Other countries see chat box for the website
- Please Mute with *6



Previous Sessions:

Electric Server Agent
RDX Removable disks
Dynamic Platform Optimiser
PowerSC
POWER Advisors
POWER7 Affinity and Perf.
Updating Power, I/O & HMC
VPM for IBM i
ISD VMControl
- Capture & Deploy
SSP3

Future Sessions → <http://tinyurl.com/newUK-PowerVM-VUG>

- Sept 11th : Monitoring POWER/AIX/VIO
with IBM Tivoli Monitoring - Andy Thomas
- **Suggestions Welcome**



Twitter:
Nigel Griffiths @mr_nmon
Jyoti Dodhia @JyotiDodhia
Website <http://tinyurl.com/newUK-PowerVM-VUG>



Power Systems Virtualisation from IBM - Technical Webinar User Group

IBM

Whole POWER Machine Monitoring

This is an interactive session, I want to find out
what you use and what you find interesting



Nigel Griffiths
IBM Power Systems
Advanced Technology Support, Europe **Version 4**

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What is the difference between: Performance monitoring

and Capacity Planning?

What is the difference between: Performance monitoring

- Large data volume
- Second by second
- Tuning focus → what is happening now
- Individual resources like each disk I/O

and Capacity Planning?

- Smaller data
- Hour by hour - some go for 15 minutes
- Tracking focus → for the future
- Summarised data like total disk I/O

Agenda

1. Performance Management (PM) for Power Systems
2. IBM Tivoli Monitoring (ITM)
3. topas -C and topasrec
4. LPAR2rrd from Pavel (ex-IBMer)
5. HMCscanner from Frederico (IBMer)
6. nmon2[rrd|web] from Nigel & Bruce (IBMer)
7. Ganglia for POWER from Michael (IBMer)
8. 3rd party and RDBMS tools
9. HMC extract and generate
10. nmon for Linux - improvements
11. Performance Data Investigator for IBM i

PM for POWER Systems

Questionnaire

- Heard of it?
- Using it?

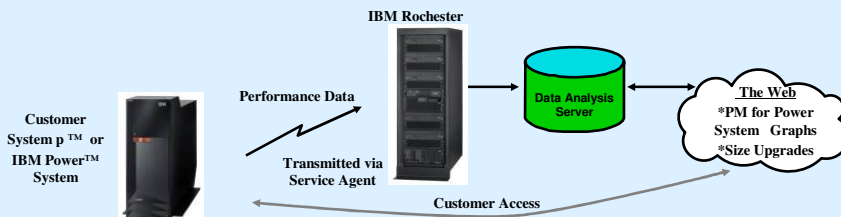


IBM Performance Management for Power Systems

www.ibm.com/systems/power/support/perfmgmt/

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Performance Monitoring as a Service



IBM Performance Management for Power Systems

www.ibm.com/systems/power/support/perfmgmt/

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- No Charge service
 - Internet accessible one page summary graph showing key performance and growth data plus a projection of remaining growth of the system or partition
 - System must be under IBM warranty or on an IBM HW maintenance agreement
 - Available worldwide
 - Data can be merged with the IBM Workload Estimator to size upgrades
- Full function service
 - An IBM Global Technology Services (billable) report set available via Internet access that provides multiple detail reports on an ongoing basis depicting the growth and performance of the system
 - Available either as a stand alone fee offering or as part of an IBM premium service offering
 - Contact your IBM Representative to determine the availability, packaging, naming and pricing in your respective country

Secure website for your data

- Portal for all your systems with password control

Server Information **Manage Groups**

Currently Active Group: **pmtest (PMF)** Number of Servers: **5**

Copy Servers | Add Servers | Remove Servers | Size Next Upgrade | BP Authorization | Search within Group | Sign Out

Refresh Group Data

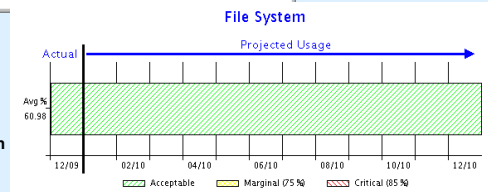
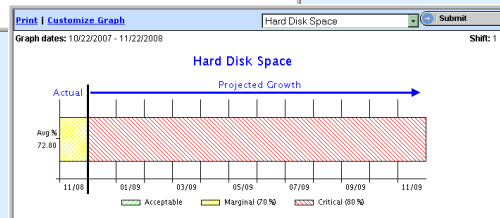
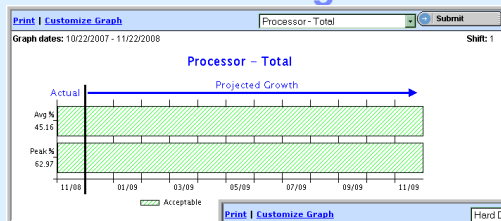
Actions	Company Name	Serial Number	LPAR	Mach Type	Model	Shift Nbr	O/S	System View	GTS Cust Contract	Server Name	Last Data Recv'd	Config Core
	IBM	06	0001	9133	55A	1	AIX			PM	2012-03-20	
	IBM	06	0001	9133	55A	2	AIX			PM	2012-03-20	
	IBM	10		7028	6E1	1	AIX			PM	2012-03-21	
	IBM	10		7028	6E1	2	AIX			PM	2012-03-21	
	ORL	65		9406	825	1	15/OS			HO	2012-03-21	
	ORL	65		9406	825	2	15/OS			HO	2012-03-21	

Company & machine names here

AIX and IBM i

Interactive Management Summary Graphs

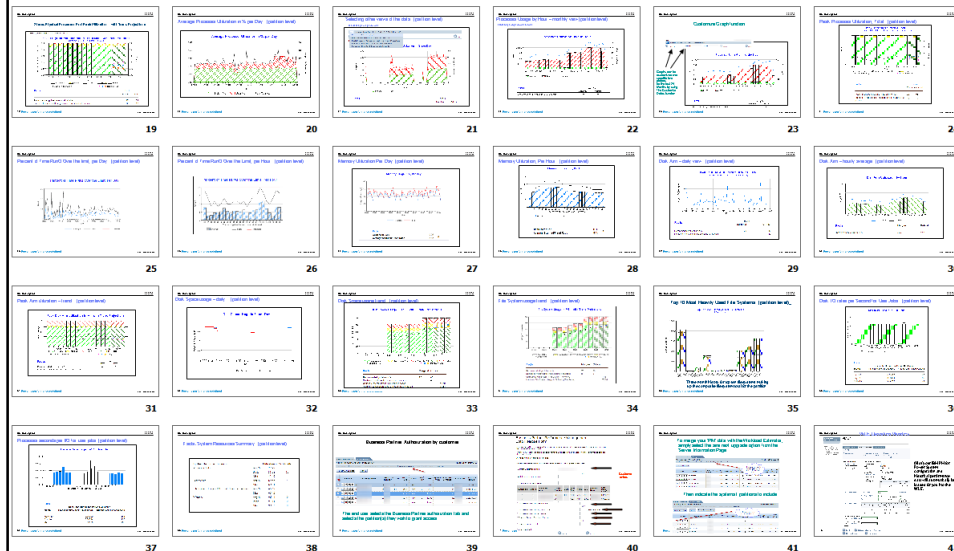
The No Additional Charge graphs



1. This data is available for no additional charge if the system is under warranty or on an IBM Hardware Maintenance Agreement.
2. The individual graphs are accessed interactively by the user and are then printable as Individual graphs. A pdf version is also available.
3. The user does have the ability to go 'backwards in time' to select the month of interest. (up to 24 months.)

Full paid for Service 100's of graphs

- Let me know if you want the full presentation



Install briefly (and roughly)

- Setup Electronic Service Agent on HMC
 - IBM Call Home – should have this already
- Get Activation key for free or fee
- Start Service on AIX (is already pre-installed)
- Job Done
- Details from www.ibm.com/systems/power/support/perfmgmt
- IBM sends you Registration key to access your data
- Check the website later.
- Sample report and graphs from
 - http://www.ibm.com/systems/resources/systems_power_support_pm_aix_sample_report.pdf

PM for POWER

Good

- AIX, IBM i supported (originally from IBM i team)
- No longer massive software installed
- Uses HMC to transfer data to IBM
- Works invisibly with no user interaction
- Lots of web based reports, graphs & projections

Bad

- Costs money per machine
- Tricky to get a list price

Anyone using another web based service ?

IBM Tivoli Monitoring (ITM)

Questionnaire

- Heard of it?
- Using it?

IBM Tivoli Monitoring (ITM) from IBM

- From IBM Software Group
- Core part of the Tivoli complete range of Systems Management products
- Can be purchase:
 - Stand-a-alone
 - Part of **Systems Director Enterprise Edition** (with CapPlan)
 - Part of **AIX Enterprise Edition**
- There are add-on packages for Capacity Planning

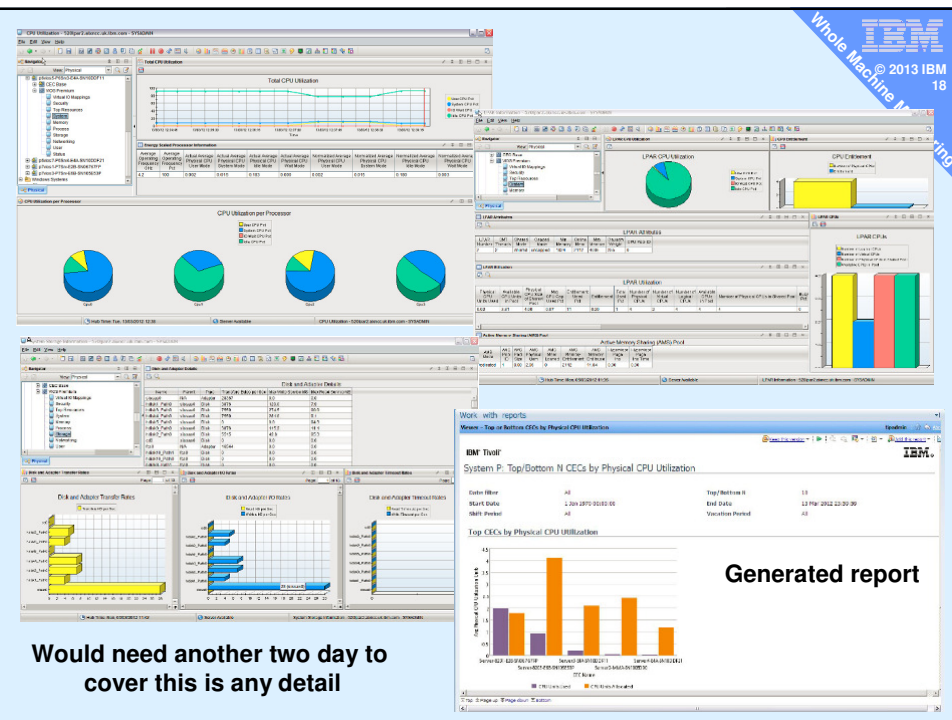
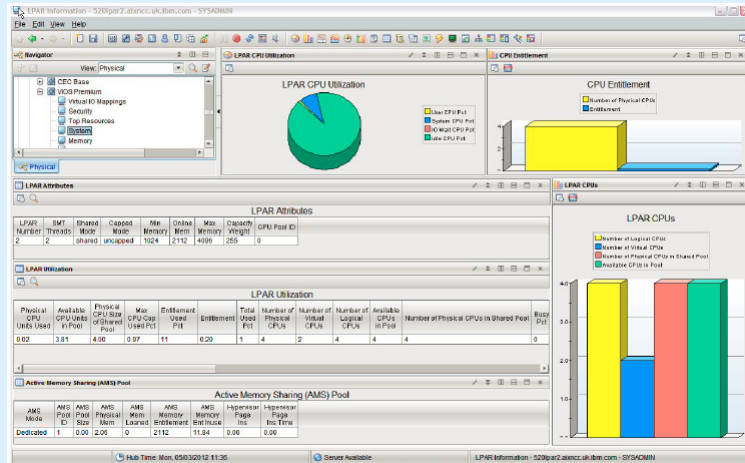
IBM Tivoli Monitoring

- Briefly
 - Very high function tool & popular in is own right
 - Install the Tivoli Framework first
 - Includes embedded dedicated single function DB2 for historical data
 - Requires an extra 1 or 2 daemons per end-point:
 - AIX
 - VIOS
 - HMC
 - Up to date with new POWER/PowerVM technology
 - Multi-user and fully configurable user interface and design of screen layout and reports

A few screen shots - I stole from Andy Thomas

Whole Machine Monitoring
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ITM Portal browser – collects everything to a RDBMS
Very configurable for stats, styles, colours, aggregates



Would need another two day to cover this in any detail

IBM Tivoli Monitoring

Good

- Current for new POWER/PowerVM features
- Covers everything & non-IBM machines too
- Extremely flexible in presenting data
- Automated report generator

Bad

- Costs money per machine
- Needs own LPAR and resources to run
- Installing daemons everywhere
- Needs time/training to get the full benefit because it is so flexibly (good)

topas -c and topasrec

Questionnaire

- Heard of it?
- Using it?

topas -C and topasrec

- topas -C
 - Only online
 - Only AIX/VIOS
- topasrec
 - topasout
 - CEC Analyser

Topas CEC Monitor		Interval: 10	Thu Jul 28 17:04:57 2006											
Partition Info	Memory (GB)	Processor												
Monitored : 6	Monitored :24.6	Monitored :1.2	Shr Physical Busy:	0.30										
UnMonitored: -	UnMonitored: -	UnMonitored: -	Ded Physical Busy:	2.40										
Shared : 3	Available :24.6	Available: -	Hypervisor											
Dedicated : 3	UnAllocated : 0	UnAllocated: -	Dedicated : 5											
Capped : 1	Consumed : 2.7	Shared :1.5	Virt. Context Switch: 632											
Uncapped : 1		Dedicated : 5	Phantom Interrupts : 7											
		Pool Size : 3	APP = Pool Size - Shared Physical Busy											
		Avail Pool : 2.7												
Host	OS	M	InU	Lp	Us	Sy	Wa	Id	PhysB	Ent	%BntC	Vcsw	PhI	
-----shared-----														
ptoolsl3	A53	c	4.1	0.4	2	14	1	0	84	0.08	0.50	15.0	208	0
ptoolsl2	A53	C	4.1	0.4	4	20	13	5	62	0.18	0.50	36.5	219	5
ptoolsl5	A53	U	4.1	0.4	4	5	0	0	95	0.04	0.50	7.6	205	2
-----dedicated-----														
ptoolsl1	A53	S	4.1	0.5	4	20	10	0	70	0.30				
ptoolsl4	A53		4.1	0.5	2	100	0	0	0	2.00				
ptoolsl6	A52		4.1	0.5	1	5	5	12	88	0.10				

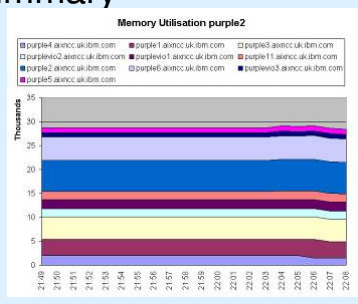
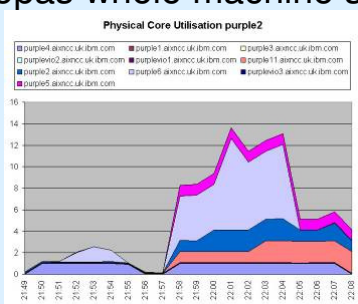
topas CEC recording

– https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Power%20Systems/page/topas_CEC_Analyser

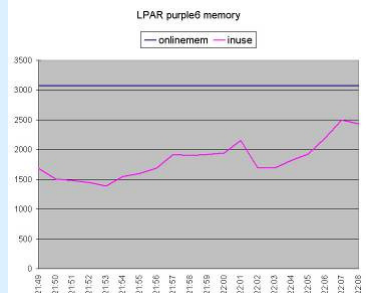
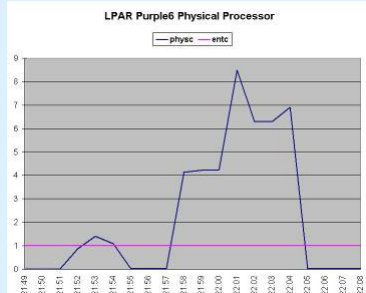
topas generally

– <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Power%20Systems/page/Performance%20Monitoring%20with%20topas>

Topas whole machine summary



Drill down to a single LPAR stats



topasrec - Good and bad

Good

- Single recording on one AIX/VIOS for the whole machine stats (remotely connects to xmtopas)
- Simple to create

Bad

- Post-mortem only - next day (not live)
- Excel - not web
- Has problems scaling
 - From my memory: above a few dozen LPARs Excel fails
 - Needs checking again!

Example: NMON_DATA/topas_ECE/sample_cec_101222_2149.topas.nmon.xls

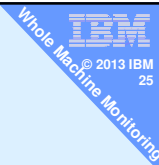


Questionnaire

- Heard of it?
- Using it?

LPAR2rrd

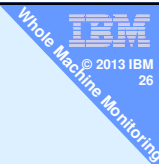
LPAR 2 RRD



- <http://www.lpar2rrd.com/>
- <http://www.lpar2rrd.com/>
- LPAR2RRD offered as open source - free to use
- Can purchase support from \$1500 per customer
- Extracts the HMC data about LPARs via cron
- Then rrdtool used to save data & graph it
- New version can dynamically get updates
- Updates add new features regularly

Major Advantages

LPAR 2 RRD



- Install
 - Pretty good install details on the website (1-2 hour)
 - Needs it own LPAR + web server (apache) & some other open source packages
- Just connects to the HMC with read-only account
 - No massive install of agents on 100's of LPARs
- Includes history

LPAR2rrd uses rrdtool

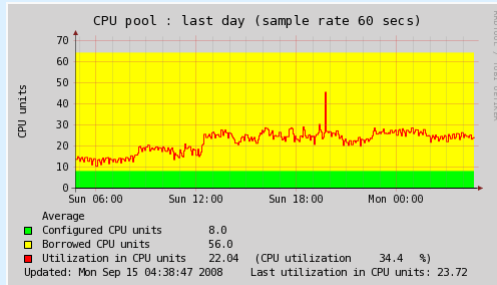
LPAR RRD

- rrdtool is an open source utility

- Fixed size "database"
 - Round robin
 - Summarise & cascade

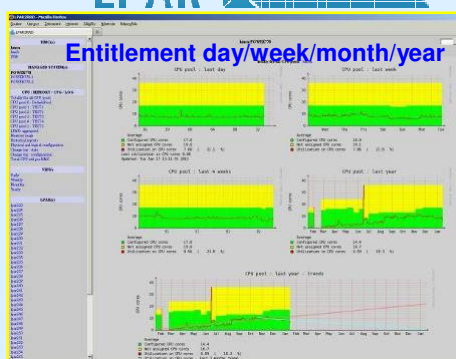
- Good for storing stats

- Create your rrd
- Regularly add stats
- Extract any time period and gets the available stats
- Generates graph images ready for a website

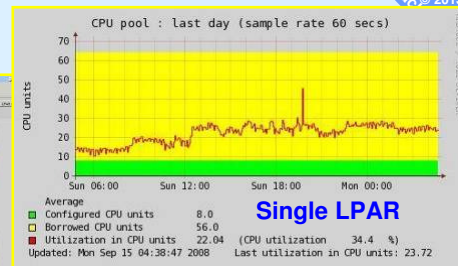


LPAR RRD

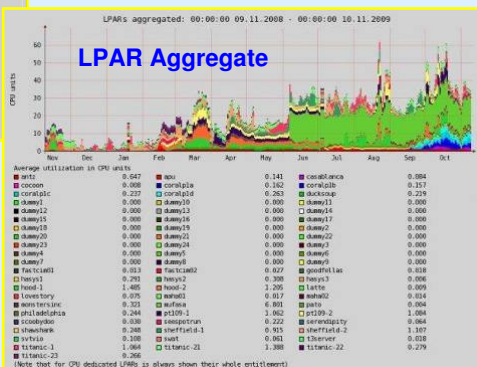
Entitlement day/week/month/year



Trend Prediction Graph

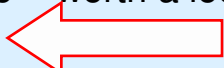



Single LPAR



LPAR2rrd

LPAR 2 RRD

- Project website
 - <http://sourceforge.net/projects/lpar2rrd/?source=directory>
- LPAR2RRD Home Website
 - <http://lpar2rrd.com/>
- LPAR2RRD Home Website demo = worth a look
 - <http://demo.lpar2rrd.com/lpar2rrd/> 
 - <http://demo.lpar2rrd.com/lpar2rrd/>
- Nigel's
 - <http://purple7.aixncc.uk.ibm.com/lpar2rrd/index.html> 

LPAR2rrd

LPAR 2 RRD

Good

- Simple setup to HMC read-only
- Web-based so freely viewable
- Free
- Growing popularity
- Once found by users they run it long term
- Could be run on Linux machine or LPAR
- Regular new features

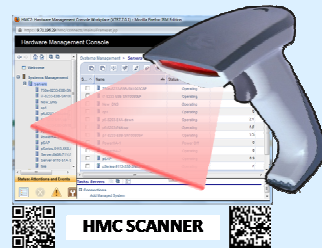
Bad

- Pre-reqs RPM's mean it's a dedicated LPAR for AIX
- Not full performance tuning detail level
(no disk, network, process, ... stats)

HMCscanner

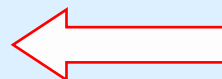
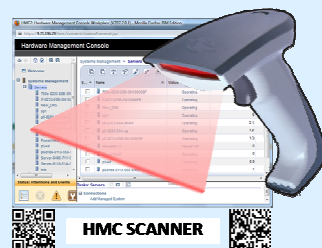
Questionnaire

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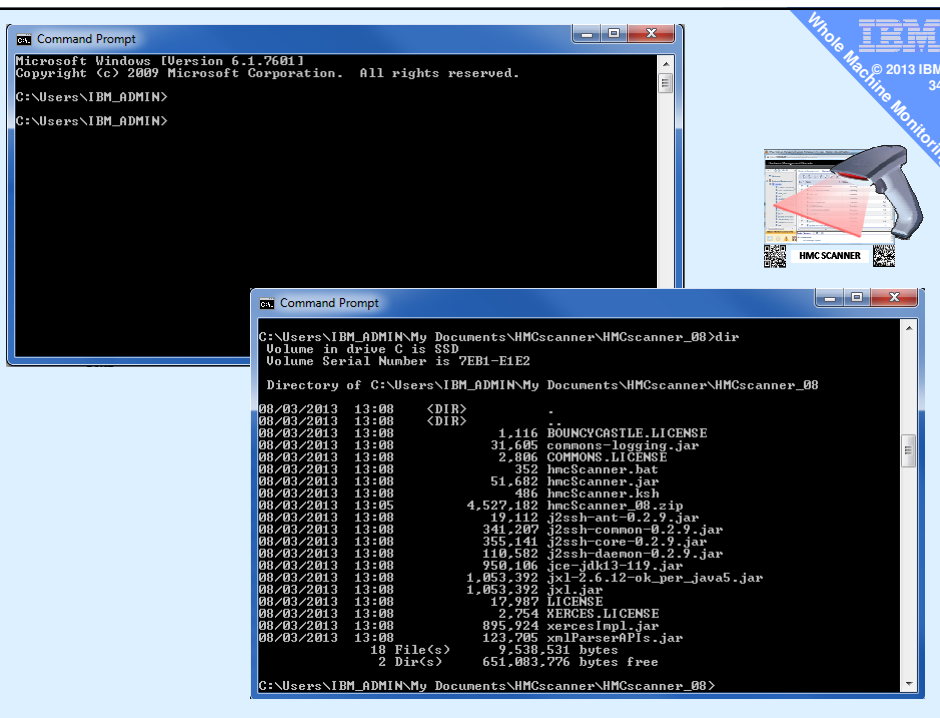
HMC Scanner

- **Creates an Excel spreadsheet of your**
 - HMC, Power System Servers and LPAR and performance stats
- Another brilliant Java tool from Federico Vagnini (IBM Italy)
- Public website
 - <https://www.tinyurl.com/HMCscanner>
 - <https://www.tinyurl.com/HMCscanner>
- Just updated to version 0.10.3



HMC Scanner

1. Just download to Windows 7 in a directory
2. Unzip it
3. Open "Command Prompt"
4. cd to the directory with the .bat file
5. Run:
`hmsscanner.bat hmc.acme.com hscroot -p secretpassword -stats`
6. Double click the file and be amazed
7. Then phone Federico's manager and suggest Federico deserves a pay rise



Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

```
C:\Users\IBM_ADMIN>  
C:\Users\IBM_ADMIN>  
C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08>dir  
Volume in drive C is SSD  
Volume Serial Number is 7EB1-E1E2  
Directory of C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08  
08/03/2013 13:08 <DIR> .  
08/03/2013 13:08 <DIR> ..  
08/03/2013 13:08 1,116 BOUNCVCASTLE.LICENSE  
08/03/2013 13:08 31,605 commons-logging.jar  
08/03/2013 13:08 2,806 COMMONS.LICENSE  
08/03/2013 13:08 352 hmsscanner.bat  
08/03/2013 13:08 51,682 hmsscanner.jar  
08/03/2013 13:08 486 hmsscanner.ksh  
08/03/2013 13:05 4,527,182 hmsscanner_08.zip  
08/03/2013 13:08 19,112 j2ssh-ant-0.2.9.jar  
08/03/2013 13:08 341,207 j2ssh-common-0.2.9.jar  
08/03/2013 13:08 355,141 j2ssh-core-0.2.9.jar  
08/03/2013 13:08 110,582 j2ssh-daemon-0.2.9.jar  
08/03/2013 13:08 950,106 jce-jdk13-119.jar  
08/03/2013 13:08 1,053,392 jxl-2.6.12-ok_per_java5.jar  
08/03/2013 13:08 1,053,392 jxl.jar  
08/03/2013 13:08 17,987 LICENSE  
08/03/2013 13:08 2,754 MERCES.LICENSE  
08/03/2013 13:08 895,924 xercesImpl.jar  
08/03/2013 13:08 123,765 xmlParserAPIs.jar  
08/03/2013 13:08 9,538,531 bytes  
18 File(s)  
2 Dir(s) 651,083,776 bytes free  
C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08>
```

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```

C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08>hmcscanner.bat hmc11.aixmcc.uk.ibm.com
hmcScanner version 0.8
Detecting manager type: HMC
Detecting managed systems: 15 systems present.
Starting managed system configuration collection:
Scanning bronze-8203-E40-SN10E0A21: ..... DONE
Scanning brown-9115-505-SN6509E5A: ..... DONE
Scanning diamond-8233-E8B-SN100271P: ..... DONE
Scanning gold-8203-SN10E0A11: ..... DONE
Scanning green-8231-E2B-SN06FC44P: ..... DONE
Scanning grey-9117-MMA-p570-8F: ..... DONE
Scanning indigo-8231-E1C-SN0659FDR: ..... DONE
Scanning lime-9115-505-SN10E6DBF: ..... DONE
Scanning oldlace-65BD12E: ..... DONE
Scanning orange-8203-E40-SN10E0A51: ..... DONE
Scanning pink-9115-505-SN65080E8: ..... DONE
Scanning plun-8204-E8A-SN105C0B0: ..... DONE
Scanning purple-9117-MMB-SN100525P: ..... DONE
Scanning red-8203-E40-SN10E0A41: ..... DONE
Scanning silver-8203-SN10E0A31: ..... DONE
Collection successfully finished. Data is in C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08\hmc11.aixmcc.uk.ibm.com\
Performance data collection:
Loading bronze-8203-E40-SN10E0A21: ..... DONE
Loading brown-9115-505-SN6509E5A: ..... DONE
Loading diamond-8233-E8B-SN100271P: ..... DONE
Loading gold-8203-SN10E0A11: ..... DONE
Loading green-8231-E2B-SN06FC44P: ..... DONE
Loading grey-9117-MMA-p570-8F: ..... DONE
Loading indigo-8231-E1C-SN0659FDR: ..... DONE
Loading lime-9115-505-SN10E6DBF: ..... DONE
Loading oldlace-65BD12E: ..... DONE
Loading orange-8203-E40-SN10E0A51: ..... DONE
Loading pink-9115-505-SN65080E8: ..... DONE
Loading plun-8204-E8A-SN105C0B0: ..... DONE
Loading purple-9117-MMB-SN100525P: ..... DONE
Loading red-8203-E40-SN10E0A41: ..... DONE
Loading silver-8203-SN10E0A31: ..... DONE
Starting Excel file creation. Done: C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08\hmc11.aixmcc.uk.ibm.com_scan.xls
C:\Users\IBM_ADMIN\My Documents\HMCscanner\HMCscanner_08>
  
```

Output file →

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Demo:
See website for an example
C:/.../My Documents/HMCscanner/HMCscanner_09

Name	Date modified	Type	Size
hmc11.aixmcc.uk.ibm.com_scan.xls	08/03/2013 13:23	Microsoft Excel W...	470 KB
BOUNCYCASTLE.LICENSE	08/03/2013 13:08	LICENSE File	2 KB
COMMONS.LICENSE	08/03/2013 13:08	LICENSE File	3 KB
commons-logging.jar	08/03/2013 13:08	Executable Jar File	31 KB
hmcScanner.bat	08/03/2013 13:08	Windows Batch File	1 KB
hmcScanner.jar	08/03/2013 13:08	Executable Jar File	51 KB
hmcScanner.ksh	08/03/2013 13:08	KSH File	1 KB
j2ssh-ant-0.2.9.jar	08/03/2013 13:08	Executable Jar File	19 KB
j2ssh-common-0.2.9.jar	08/03/2013 13:08	Executable Jar File	334 KB
j2ssh-core-0.2.9.jar	08/03/2013 13:08	Executable Jar File	347 KB
j2ssh-daemon-0.2.9.jar	08/03/2013 13:08	Executable Jar File	108 KB
jce-jdk13-119.jar	08/03/2013 13:08	Executable Jar File	928 KB
jxl.jar	08/03/2013 13:08	Executable Jar File	1,029 KB
jxl-2.6.12-ok_per_java5.jar	08/03/2013 13:08	Executable Jar File	1,029 KB
LICENSE	08/03/2013 13:08	File	18 KB
XERCES.LICENSE	08/03/2013 13:08	LICENSE File	3 KB
xercesImpl.jar	08/03/2013 13:08	Executable Jar File	875 KB
xmlParserAPIs.jar	08/03/2013 13:08	Executable Jar File	121 KB
hmcScanner_08.zip	08/03/2013 13:05	Compressed (zipp...	4,422 KB
hmc11.aixmcc.uk.ibm.com	08/03/2013 13:20	File folder	
hmc11.uk.ibm.com	08/03/2013 13:17	File folder	

Output →

.bat ugh! →

.ksh 😊 →

HMC Scanner

- <http://tinyurl.com/HMCscanner>
- Information is organized in tabs:
 - System summary: name, serial #, cores, RAM, service processor IP for each server
 - LPAR Summary: all LPAR by server, status, environment, version, processor mode
 - LPAR CPU: processor configuration of each LPAR
 - LPAR MEM: memory configuration of each LPAR
 - Physical Slots: with LPAR assignment, description, physical location & drc_index
 - Virtual Ethernet: network configuration of each virtual switch and each LPAR
 - Virtual SCSI: config of all virtual SCSI adapters, both client and server
 - VSCSI Map: devices mapped by each VIOS to partitions
 - Virtual Fibre: vFC config of client & server with id of physical adapter assigned
 - SW Cores: LPAR & VP pool config matrix to # of software licenses.
 - CPU Pool Usage: easy to read history of CPU usage of each system. **
 - Sys RAM Usage: easy to read history of physical RAM assignment to each LPAR.**
 - LPAR CPU Usage: easy to read history of CPU usage of each LPAR.
 - ** Based on last 12 months of lslparutil data.

HMCScanner

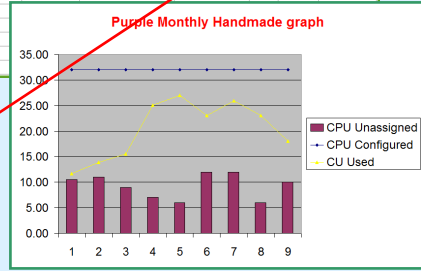
purple-9117-MMB-SN100526P

Name	Status	Mode	Virt/Phys procs			Entitlement			Weight	Sharing Mode	Shared Pool			E:VP %
			Min	Curr	Max	Min	Curr	Max			Name	Resv	Max	
purple12 IBMi	Off	shared	1	8	2	0.50	6.50	2.00	0	cap	DefaultPool			123.00
purple11-AIX7sp1	Off	shared	1	1	5	0.20	0.40	5.00	0	uncap	DefaultPool			MicroLPAR
purple10_RH55	Off	shared	1	1	2	0.20	0.80	0.50	0	uncap	DefaultPool			MicroLPAR
purple9_fresh	Off	shared	0	0	0	0.00	0.00	0.00	0	uncap	DefaultPool			Off
purple8_SLES11	Off	shared	1	0	2	0.20	0.00	0.50	0	uncap	DefaultPool			Off
purple7-AIX7_TL1_WPAR	On	shared	1	8	16	0.20	8.00	4.00	100	uncap	DefaultPool			100.00
purple6	Off	shared	1	0	10	0.20	0.00	10.00	0	uncap	DefaultPool			Off
purple5-AIX5	Off	shared	1	0	2	0.20	0.00	0.50	0	uncap	DefaultPool			Off
purple4-ISD63-NIM	On	shared	1	2	4	0.20	0.80	4.00	100	uncap	DefaultPool			250.00
purple-hpc	Off	ded	1	0	32					share_idle_procs				Dedicated
purple2-ISD63	On	shared	1	4	4	0.10	2.00	4.00	120	uncap	DefaultPool			200.00
purple1-Blue-Wiki	On	shared	1	14	32	0.50	2.00	4.00	200	uncap	DefaultPool			700.00
diamond9	On	shared	1	4	8	0.10	3.00	8.00	120	uncap	DefaultPool			133.00
mmatull	Off	ded	0	0	0					share_idle_procs				Dedicated
purplevio3	Off	shared	1	0	4	0.20	0.00	2.00	0	uncap	DefaultPool			Off
purplevio2	On	shared	1	2	4	0.20	1.00	2.00	200	uncap	DefaultPool			200.00
purplevio1	On	shared	1	2	4	0.20	1.00	2.00	200	uncap	DefaultPool			200.00
purplevio4	On	shared	1	1	2	0.10	0.50	2.00	120	uncap	DefaultPool			MicroLPAR
purple3 Repository	On	shared	1	3	6	0.10	2.00	4.00	200	uncap	DefaultPool			150.00

	Size	Assigne	Available
Active Physical Cores	32		
Dedicated Cores	0		
Shared Pool	32	28.00	4.00
Virtual Processors	50.00		

Total VP:Physical Cores ratio (totalVP:PC)

Entitlement:VP ratio (E:VP)



HMCscanner

Good

- Simple setup
- Only needs a HMC password
- 100% Accurate configuration data
- Perfect for whole machine settings/tuning
 - E too low, VP too high, Virtual to Physical CPU ratio
- Rapidly improving – so make a suggestion

Bad

- Excel - perhaps daily save to a website to allow simple sharing
- Future releases may have some basic CPU graphs



nmon2rrd and nmon2web

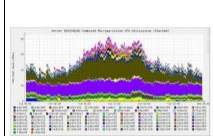
Questionnaire

- Heard of it?
- Using it?

nmon2[rrd|web]

- <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#wiki/Power%20Systems/page/Other%20Performance%20Tools>
- Or <http://tinyurl.com/newAIXwiki> then click "Other Performance tools"

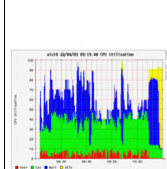
nmon2web- Bruce Spencer's Perl tools to generate web pages from multiple nmon files via rrdtool



nmon files are used to aggregate performance across a shared server and display as a web page

- o The nmon data from many AIX or Linux machines can be automatically used to generate web pages
- o The web pages include the configuration and performance graphs, non-standard AIX settings and change history
- o Setting up the nmon2web tool is trivial. However, it requires a web server with Apache, PHP and rrdtool.
- o Take this link for downloading nmon2web [nmon2web](#) Note:This is a link to Open Source website not on MyDeveloperWorks
- o Take this link for the [nmon2web README](#) Note:This is a link to Open Source website not on MyDeveloperWorks
- o Take this link to learn more about [rrdtool](#) Note:This is a link to Open Source website not on MyDeveloperWorks

nmon2rrd - Nigel Griffiths' C tools to show convert nmon files ready for rrdtool



This tool is written in C and the source code provided to allow user fixes and learning

- o nmon2rrd generates from a single nmon output file
 - o a script to create suitable rrdtool databases
 - o a script to load the rrdtool databases from reformatted nmon data
 - o a script to extract the data in graph file ready for a website
 - o a index.html web file which pulls in the graphs and configurations information


This can be used as the basis for writing your own automating nmon file to a website but operates on a single file

- o You have to handle the transport of nmon files to the web server, scripting to run nmon2rrd and the web server itself.

Take a look at nmon2web from Bruce (above), if you want more automation from the tool itself as a start point

- o Take this link to the nmon page a search for "nmon2rrd" section [nmon2rrd](#)
- o Take this link to learn more about [rrdtool](#) Note:This is a link to Open Source website not on MyDeveloperWorks

nmon2rrd

- Simple C filter program
- `nmon2rrd -f <nmonfile> -d <directory> -x`
- Generates
 - Script to create rrd files
 - Script to load rrd
 - Script to create performance graphs
 - Runs these script (-x)
 - Web server index.html with some config & graphs
- Demo Sample (internal to IBM)
 - <http://w3.aixncc.uk.ibm.com/nmon2rrd/> 
 - <http://w3.aixncc.uk.ibm.com/nmon2rrd>

nmon2rrd Good and Bad

Good

- All processing on AIX
- Creates a website for all to access
- Code released as a sample so C programs can do what ever they like.
- Minimal skills: apache, index.html, written in C

Bad

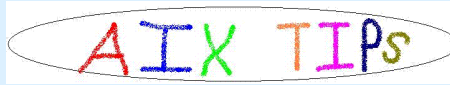
- Its just the filter
- You have to collect the nmon files, organise hierarchy of machines and days, script etc.
- Post-mortem only

nmon2web

- IBMer Bruce Spencer
- Currently difficult to find the download
 - Apparently the web server failed
- Has a very committed user base
- German customer with 20+ large Power 795 & wall-to-wall nmon2web with ~500 LPARs
- Includes regular adding of nmon data to permanent RRD files to build up history
- Then web front-end allows any stats over any time graphing and comparing different times



nmon2web



- Temporary website

<http://ca.astound.net/~baspence/AIXtip/nmon2web.htm>

- Current version nmon2web_20120727.tar.gz

- aixtipshead.gif
- index.html
- nmon2web_20120730.pl
- nmon2web.cgi
- readme.html

User interface – Note: I replaced the logo

nmon2web by Bruce Spencer

The provided Perl scripts are provided as-is and are not supported by IBM

Display a Daily Performance Chart for a Host

Server Name

Date

Display Long Term Performance Trends for a Host

Server Name

Display the Aggregate Utilization on a Partitioned System

System Serial Number

Start Date

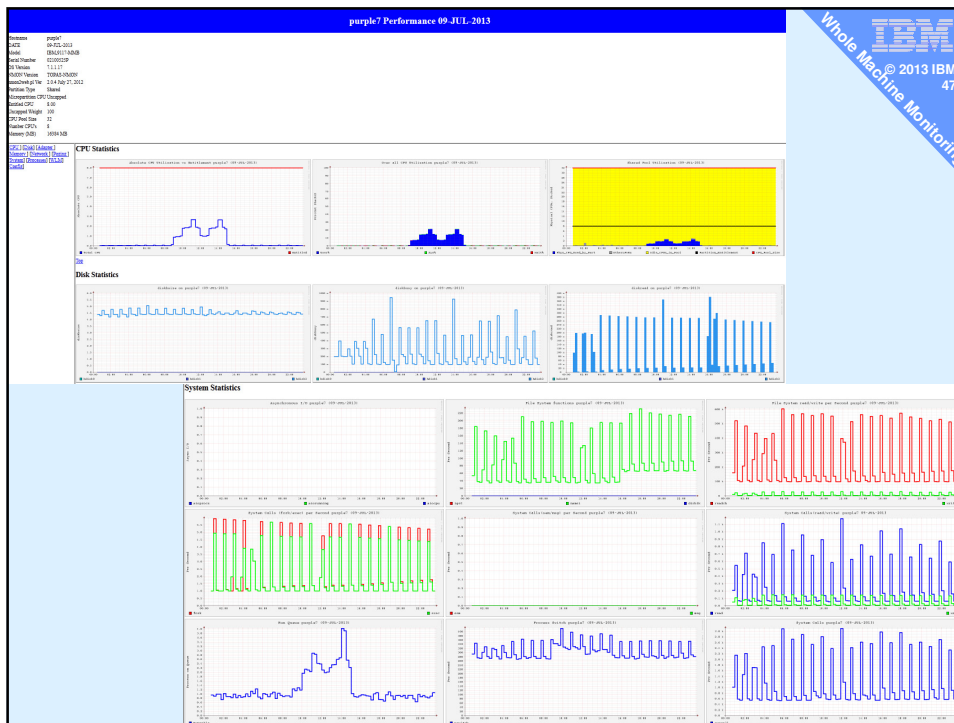
End Date

Servers Ordered by Serial Number (Click Server Name for configuration)

Serial Number	Server Name	Partition Type	First Record Date mm/dd/yyyy	Last Record Date mm/dd/yyyy
02100525P	blue	Shared	06/25/2013	07/02/2013
02100525P	purple7	Shared	07/03/2013	07/03/2013

- <http://purple7.aixncc.uk.ibm.com/nmon2web/>





Whole Machine Monitoring
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nmon2web

Good

- nmon2web better for a website repository & building historic data for graphing
- Free
- Minimal skills: apache, CGI, written in Perl
- Flexible: you code it = you got it

Bad

- You have to sort out transporting nmon files
- You are on your own (but its really only 2 scripts)
- Tells you what happened yesterday or longer ago

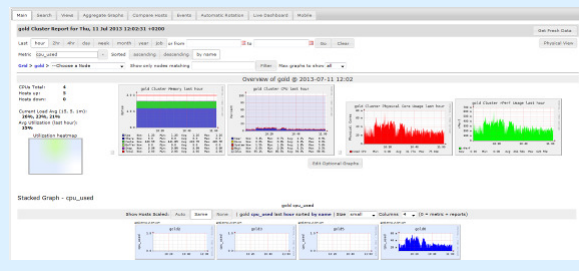
nmon2rdd = it is only a reformatting filter and everything else is your problem!

Ganglia for POWER Systems



Questionnaire

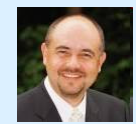
- Heard of it?
- Using it?



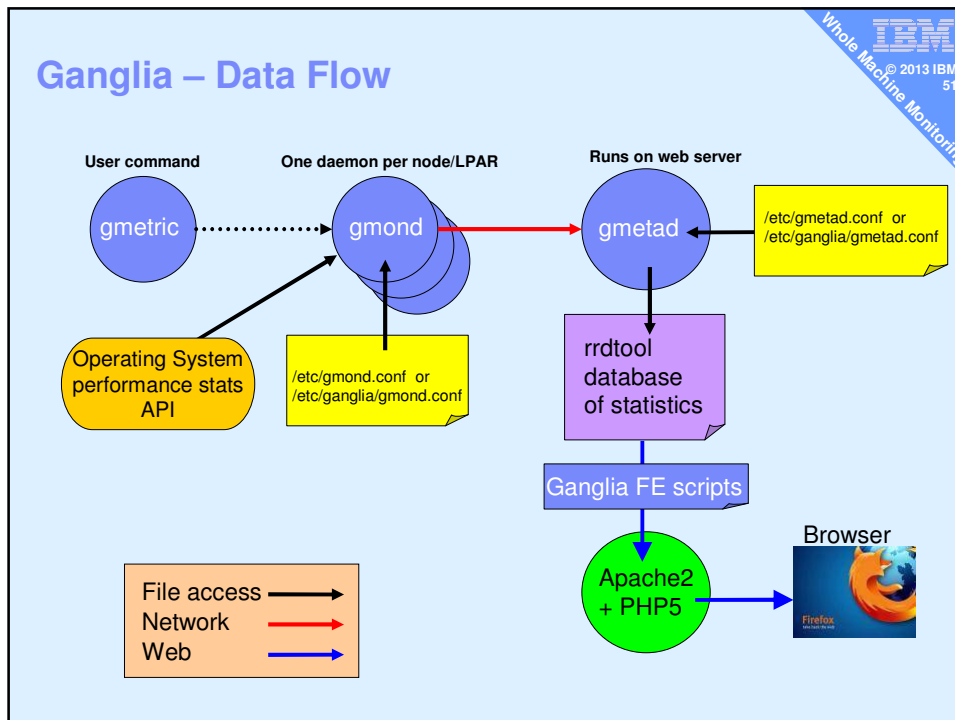
Ganglia





- Ganglia - open source monitoring solution
- Supports many operating systems
- Light weight highly scalable to 1000's of nodes
- Data stored in rrdtool
- Display via website
- Extremely flexible whole machine, node and drill down with time ranges and aggregation

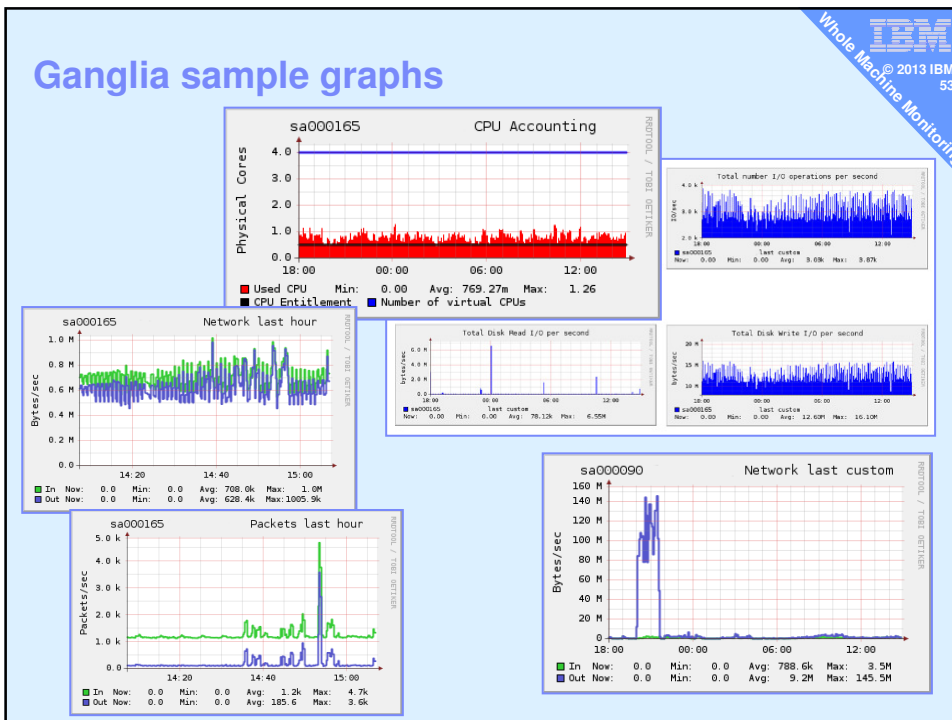


Dr. Michael Perzl (mperzl@de.ibm.com)

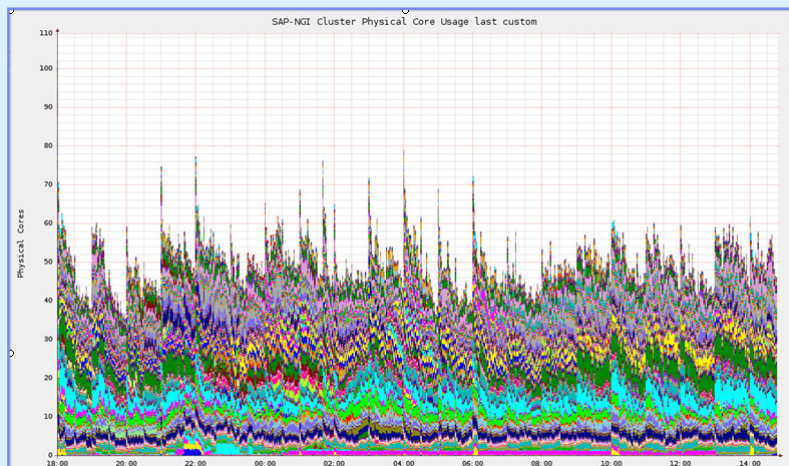


- ## Ganglia additional Power5/6/7 Metrics
- 22 additional metrics for AIX & PowerLinux:**  
- | | |
|--------------------|-----------------|
| 1. capped | 11. fwversion |
| 2. cpu_entitlement | 12. kernel64bit |
| 3. cpu_in_lpar | 13. lpar |
| 4. cpu_in_machine | 14. lpar_name |
| 5. cpu_in_pool | 15. lpar_num |
| 6. cpu_pool_idle | 16. modelname |
| 7. cpu_used | 17. oslevel |
| 8. disk_read | 18. serial_num |
| 9. disk_write | 19. smt |
| 10. disk_iops | 20. splpar |
| | 21. weight |
- For Power6/7 only (at least AIX V5.3 TL07 required):**
22. cpu_in_syspool (on a Power5 system: same value as cpu_in_pool)

Ganglia sample graphs



Ganglia aggregate LPARs



- <http://gold6.aixncc.uk.ibm.com/ganglia>
- <http://gold6.aixncc.uk.ibm.com/ganglia>



Ganglia



Good

- Free
- Very efficient
- Aggregate LPAR view and drill down to LPAR
- Popular
- Any UNIX operating system and Linux
- Flexible period graphs etc.
- Once found by users they run it long term

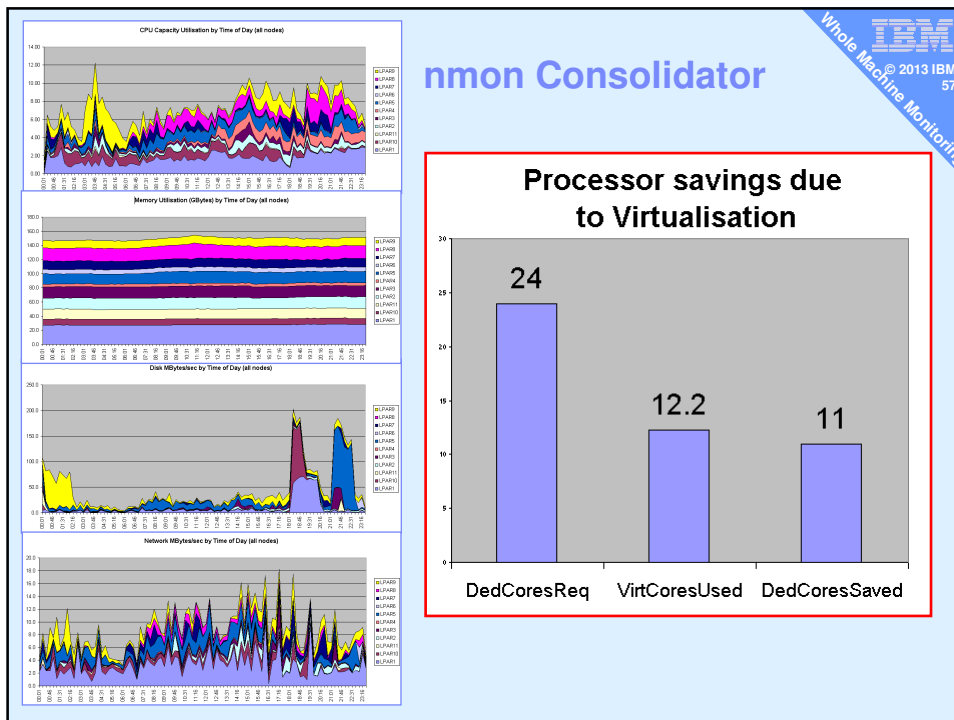
Bad

- Not full performance tuning
 - no individual disks or network adapter or processes

nmon Consolidator v1.4.1

- Produces overview charts for CPU, Memory, Network, Disk
 - Fast & simple code, pre-generated charts
 - 150 snapshot limit ←
- Multiple nmon/topasout files for:
 - ALL LPARs of one machine
 - Clustered system – Oracle RAC / HPC
 - Modelling changes from Dedicated to Shared CPU LPARs
 - Server consolidation Modelling
 - Reporting actual or potential savings from virtualisation
- Trend charts - processing multiple files from 1 LPAR





Whole Machine Monitoring
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nmon Consolidator

Good

- For one time study or consolidation estimate
- Good at doing the maths
- Aggregate LPAR view

Bad

- Have to collect lots of nmon files
- Maximum numbers of snapshots in nmon files (150)
- Manually run Excel = man-power intensive
- No shared access to the graphs

3rd party tools and RDBMS tools

There are loads of advanced products out there
Examples, I have come across:

- BMC
- Teamquest
- Mid-range Performance Group (MRG)
- Galileo Explorer

Offer data collection, historic database, overview and drill down, aggregate & trending/prediction
... at a cost

Others add nmon data to a RDBMS


- Then use tools to extract & report data / generate graphs

- And many more tool & methods ...

Raw HMC extract commands + generate report/website

- Anyone doing this?
- Anyone NOT doing this?

- Seems every script-jokey loves this challenge!
 - ssh on to the HMC and run commands
 - lshwres
 - lsparutil
 - Loop round machines & LPARs html formatting the output

- Our output is here:
 - <http://w3.aixncc.uk.ibm.com/ats-systems/today.html>
 - <http://w3.aixncc.uk.ibm.com/ats-systems/today.html> 

- Should we develop a repository of scripts?

Summary – Whole POWER Machine Monitoring

Tools

1. Performance Management (PM) for Power Systems
2. IBM Tivoli Monitoring (ITM)
3. Topas –C and Topasrec
4. LPAR2rrd
5. HMCscanner
6. nmon2[rrd|web]
7. Ganglia for POWER
8. 3rd party Advanced tools
9. HMC extract and generate

I hope 1 or 2 are new to you & you will give 1 or 2 a try very soon

nmon for Linux on POWER

```

nmon-14i                               Hostname=purple Refresh= 2secs 18:36:50
CPU Utilization
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CPU  User%  Sys%  Wait%  Idle%  EntitledCPU= 3,000--PhysicalCPUUsed= 4,592----+
 1  95.0  0.0  0.0  5.0  |25|  |50|  |75|  |100|
 2  20.0  0.0  0.0  80.0  |-----|-----|-----|-----|-----|-----|-----|-----|-----|
 3  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 4  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 5  45.3  0.0  0.0  54.7*|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 6  30.7  0.0  0.0  69.3|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 7  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 8  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
 9  45.0  0.0  0.0  55.0*|-----|-----|-----|-----|-----|-----|-----|-----|-----|
10  29.8  0.0  0.0  70.2|-----|-----|-----|-----|-----|-----|-----|-----|-----|
11  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
12  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
13  64.0  0.0  0.0  36.0*|-----|-----|-----|-----|-----|-----|-----|-----|-----|
14  43.5  0.5  0.0  56.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
15  0.5  0.0  0.0  99.5|-----|-----|-----|-----|-----|-----|-----|-----|-----|
16  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
17  44.8  0.0  0.0  55.2*|-----|-----|-----|-----|-----|-----|-----|-----|-----|
18  26.9  0.0  0.0  73.1|-----|-----|-----|-----|-----|-----|-----|-----|-----|
19  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
20  0.0  0.0  0.0  100.0|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Avg  22.2  0.0  0.0  77.8|-----|-----|-----|-----|-----|-----|-----|-----|-----|
    
```

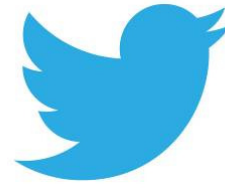
Primary threads highlighted in dots

nmon for Linux on x86 → better reporting of CPU chips, cores, Hyperthreads

Are you keeping up to date?

mr_nmon on twitter

- Only used to POWER / AIX technical content, hints, tips and links



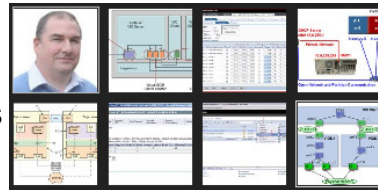
You Tube™ 125 techie hands-on videos on **You Tube** at <http://www.youtube.com/user/nigelargriffiths>

AIXpert Blog

- Lots of mini articles & thoughts
- <http://tinyurl.com/AIXpert>

Also:

- <http://tinyurl.com/ibmAIXVUG>
- <http://tinyurl.com/newAIXwiki>



Performance Data Investigator for IBM i

Jyoti Dodhia
jyoti_dodhia@uk.ibm.com
Follow me [@JyotiDodhia](https://twitter.com/JyotiDodhia)

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Performance Data Investigator (PDI) - What is it?

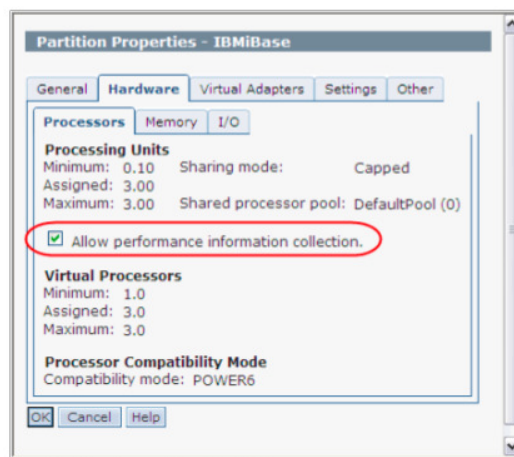
- Major new function introduced with IBM i 6.1
 - in IBM Navigator for i Web console
- Web-based GUI
- View/analyze IBM i performance data via interactive charts/tables for :
 - Collection Services
 - Job Watcher
 - Disk Watcher
 - Performance Explorer
- Performance Data Investigator = general name for the function
 - Investigate Data = actual task name
- For more info, see InfoCenter:
 - <http://pic.dhe.ibm.com/infocenter/iseri5/v7r1m0/topic/rzahx/rzahxpdi-launch.htm>

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How do I get to it?

HMC option to enable performance collection must be turned on for the IBM i partition to collect the data



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How do I get to it?

1. Open IBM Navigator for i in browser :

`https://<systemname>:2005/ibm/console`

The screenshot shows the IBM Navigator for i console interface. The browser address bar displays `https://diamond5.aixncc.uk.ibm.com:2005/ibm/console/login.do?action=secure`. The main content area shows a 'Welcome' message and a list of tasks: 'IBM Web Administration for i', 'IBM i Navigator URL Advisor', 'Digital Certificate Manager', 'IBM Tivoli Directory Server Web Administration Tool', and 'IBM IPP Server for i'. On the left, a sidebar menu is visible under 'IBM i Management', listing various system management categories like 'System', 'Basic Operations', 'Work Management', 'Configuration and Service', 'Network', 'Integrated Server Administration', 'Security', 'Users and Groups', 'Database', 'Journal Management', 'Performance', 'File Systems', and 'Internet Configurations'. The 'Performance' section is highlighted with a red circle.

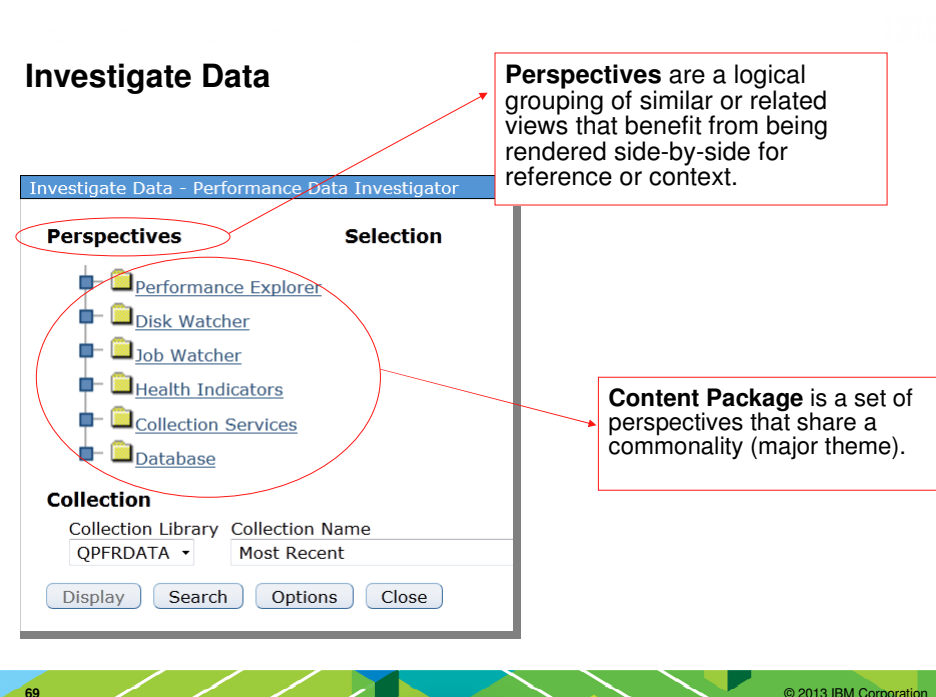
Follow these steps....

2. Expand Performance section

(it's under IBM i Management)

This screenshot is similar to the previous one, but the 'Performance' section in the sidebar menu is expanded. The 'Investigate Data' option is highlighted with a red circle, and a red arrow points from the text '3. Click on Investigate Data' below to this option. The main content area remains the same, showing the 'Welcome' message and the list of tasks.

Investigate Data

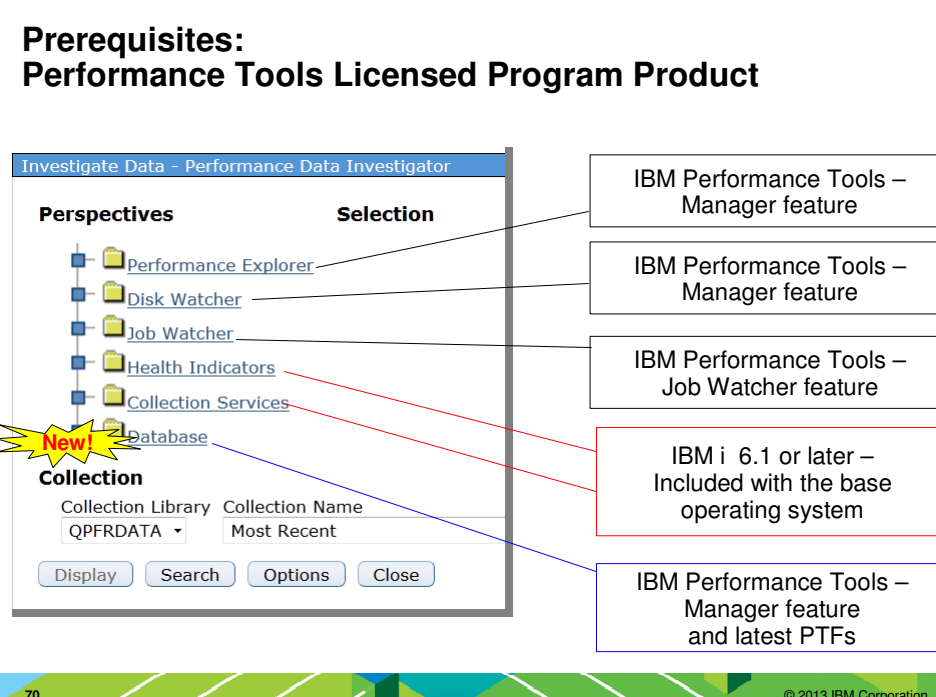


Perspectives are a logical grouping of similar or related views that benefit from being rendered side-by-side for reference or context.

Content Package is a set of perspectives that share a commonality (major theme).

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Prerequisites: Performance Tools Licensed Program Product



IBM Performance Tools – Manager feature

IBM Performance Tools – Manager feature

IBM Performance Tools – Job Watcher feature

IBM i 6.1 or later – Included with the base operating system

IBM Performance Tools – Manager feature and latest PTFs

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Investigate Data – Select Collection

The Collection boxes allow you to specify which collection you want to work with. Only collections valid for the type of chart you select will be displayed.

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Follow these steps....

4. Expand Collection Services

5. Expand Physical System

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Physical System Charts

Collection Services can collect certain high-level cross-partition processor performance metrics

For all logical partitions on the same single physical server regardless of operating system

Available on Power 6 and above, with a minimum firmware level xx340_061

Available data can be viewed via several perspectives found under "Physical System".

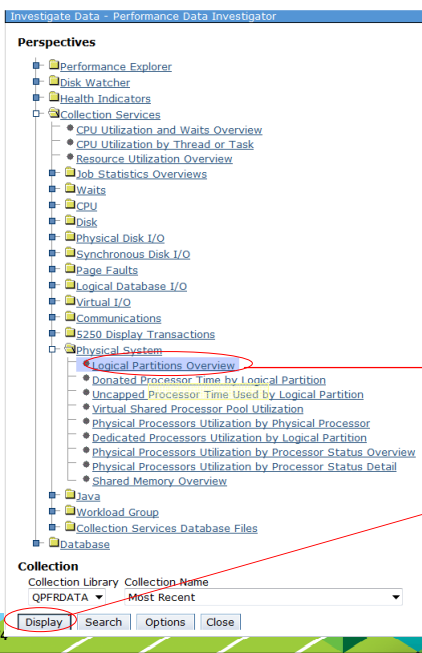


Dawn May's blog - http://ibmsystemsmag.blogs.com/i_can/2009/10/i-can-display-cpu-utilization-for-all-partitions.html

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Follow these steps....



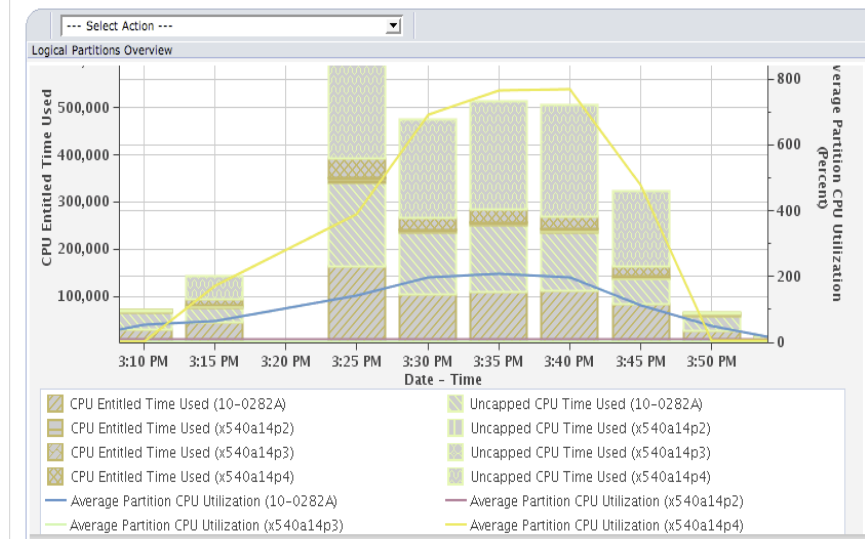
6. Click on Logical Partition Overview

7. Then click on Display

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Logical Partitions Overview Requires Power 6 and IBM i 6.1 or later



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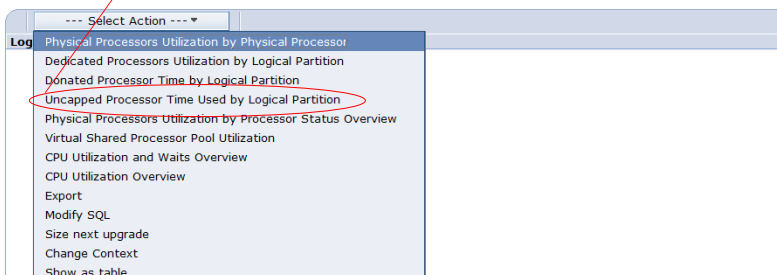
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Follow these steps....

9. Drop-down list allows you to select other options

e.g. Uncapped Processor Time used by Logical Partition

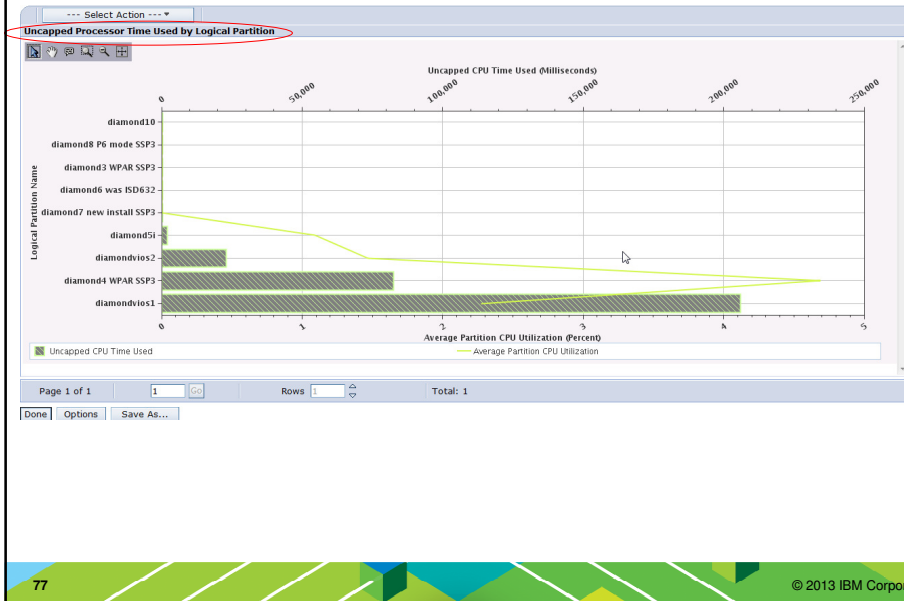
Processor Feature Code: 8336 Processor Units (allocated to partition): 1 Partition Count: 11
 Processor Feature: 8336 Processor Sharing/Capped: Yes / No Partition Memory: 4 GB
 Generated On: DIAMONDS



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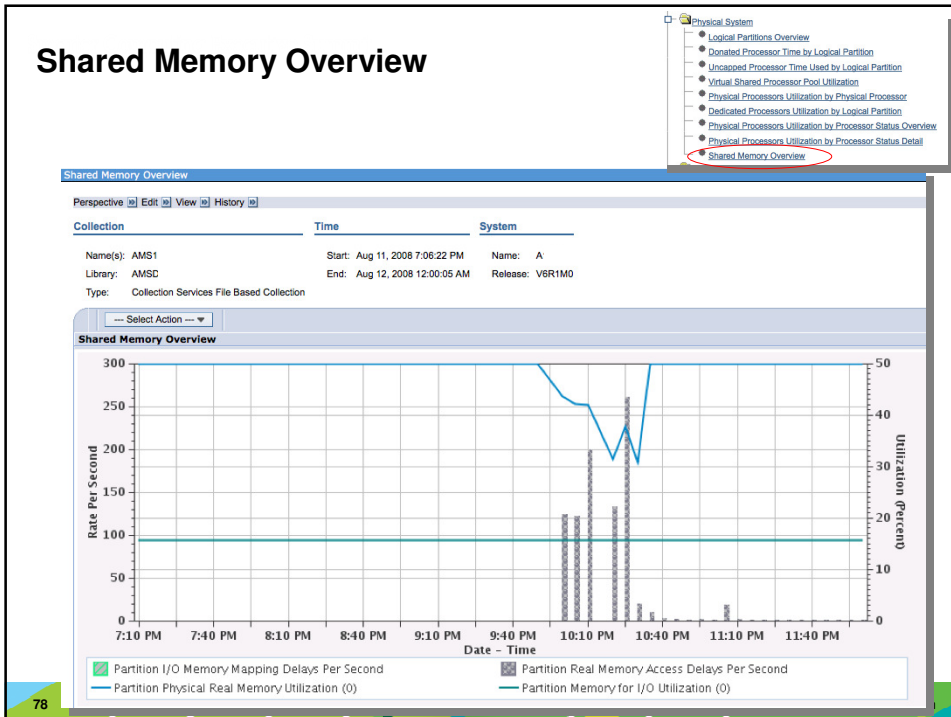
Sample graph



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Shared Memory Overview



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Power Systems Virtualisation from IBM - Technical Webinar User Group

IBM
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Next Time

Sept 11th
Monitoring POWER/AIX/VIO
with IBM Tivoli Monitoring - Andy Thomas



Previous Sessions:

Electric Server Agent
RDX Removable disks
Dynamic Platform Optimiser
PowerSC
POWER Advisors
POWER7 Affinity and Perf.
Updating Power, I/O & HMC
VPM for IBM i
ISD VMControl
- Capture & Deploy
SSP3

Future Sessions

▪ **Suggestions Welcome**



Twitter:
Nigel Griffiths @mr_nmon
Jyoti Dodhia @JyotiDodhia
Website <http://tinyurl.com/newUK-PowerVM-VUG>

