Migration – Performance Agent 4.70 to Performance Agent 5.00

for monitoring VMware ESX environments

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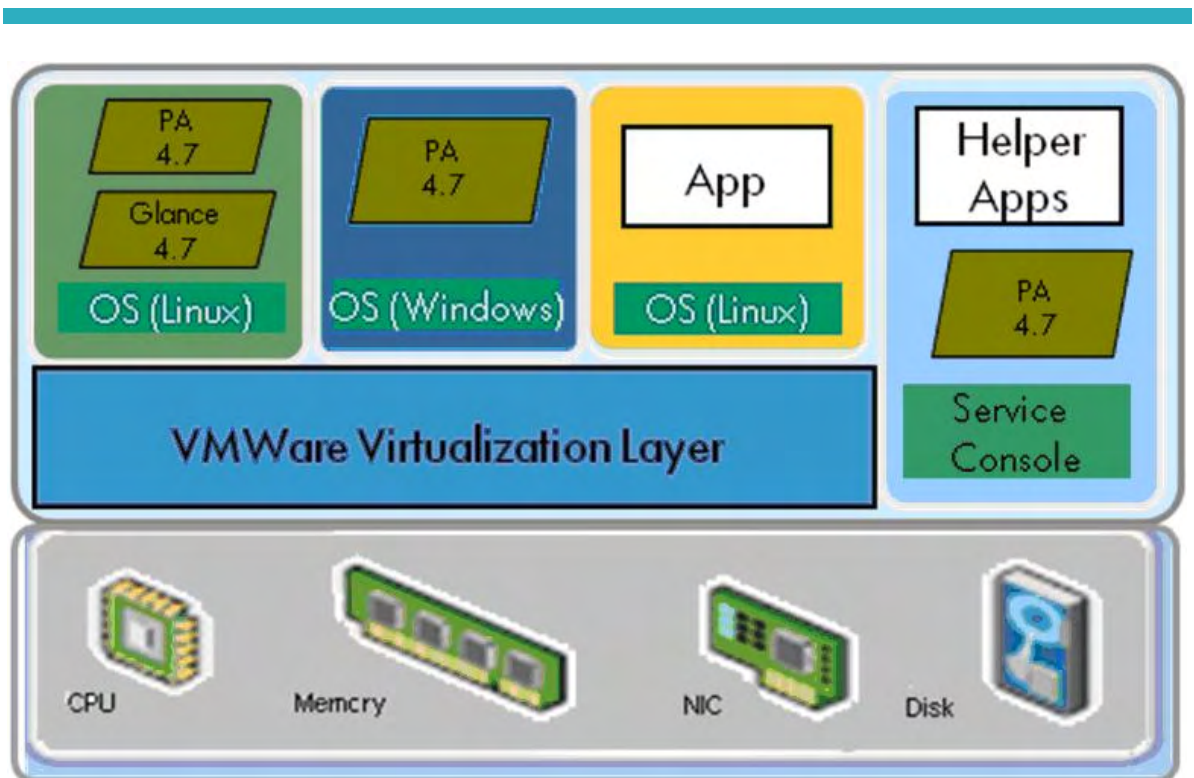Microsoft® is a U.S. registered trademark of Microsoft Corporation.

Introduction

This document provides information that enables you to migrate from HP Performance Agent 4.70 to HP Performance Agent 5.00 for managing VMware ESX environment. It includes deployment scenario of Performance Agent 4.70 and Performance Agent 5.00 and also lists out the metrics given by both. The document also provides possible migration scenarios for Performance Agent 4.70 and Performance Agent 5.00 and should be used as a reference along with the Installation and User Guide for Performance Agent.

Monitoring VMware ESX Environment with Performance Agent 4.70

Performance Agent 4.70 Supported ESX environment:
2.5.x and 3.0.x.

Deployment:

Performance Agent 4.70 can be installed on both the console and the guests hosted on an ESX Server. When installed on a guest, few additional metrics are logged by Performance Agent 4.70 (apart from those logged on a standalone system) – these additional metrics report utilization of physical resources by the guest. When installed on an ESX Server console, a new class named "BYLS" is logged to record the physical utilization of resources used by all the guests hosted on the ESX Server. Note that Glance/xglance 4.7 is not supported on console.

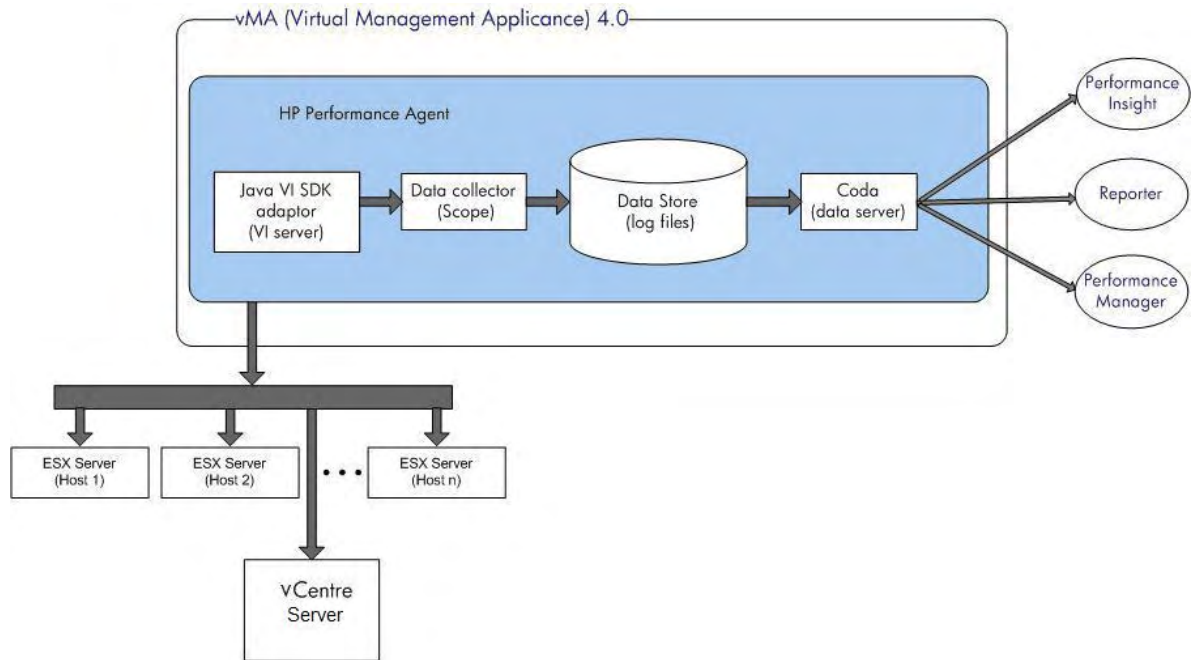For a list of Performance Agent 4.70 metrics, see the following:

- Performance Agent 4.70 BYLS metrics
- Performance Agent 4.70 additional metrics on Guest

Monitoring VMware ESX Environment with Performance Agent 5.00

Supported ESX environment:
ESX 3.5 U2 (and above) and ESX4.

Deployment:

Performance Agent 5.00 needs to be installed on vMA, and it collects data for all ESX hosts registered with that vMA. This data includes the data about guests on those ESX hosts and Resource Pools associated with those ESX hosts. Data of all these ESX hosts, guests and Resource pools are presented via logical systems class (BYLS) class. This is the main difference you will see when you migrate from PA 4.7. Performance Agent 5.00 can also be installed on the guest OS. On a guest OS it provides metrics like any other stand alone system and additionally provides metrics which enables you to know the physical utilization of the guest. Glance/xglance 5.0 is supported on vMA.

For a list of Performance Agent 5.00 metrics, see the following:

- Performance Agent 5.00 BYLS metrics
- Performance Agent 4.70 additional metrics on Guest

    Note: Performance Agent 5.00 additional metrics on guest is same as that of Performance Agent 4.70.

Performance Agent – Transition From running in ESX Console to running in vMA

With introduction of ESXi, vMA became the standard for running scripts/agents for administrating ESX/ESXi hosts and guests.

vMA is a virtual machine that includes prepackaged software, a logging Component, and an authentication component that supports non interactive login. You can use vMA to perform most of the tasks commonly performed in the ESX service console.

The vSphere CLI is also included in vMA.

For more information on vMA see the following URL:
http://www.vmware.com/go/vma/

With vMA becoming the standard, Performance Agent 5.00 runs in vMA instead of ESX console (Performance Agent 4.70).

From the Performance Agent perspective, the advantages of running in vMA are listed as follows:
1. By running in vMA, Performance Agent is now able to provide data about several ESX hosts, guests and Resource pools, which was not possible by running in console.
2. Single instance of Performance Agent can now monitor several ESX hosts/guests and resource pools.
3. By running in vMA Performance Agent follows VMware's recommended way of monitoring infrastructure, no additional overhead on ESX host.

Migration from Performance Agent 4.70 to Performance Agent 5.00

When migrating from Performance Agent 4.70 to Performance Agent 5.00, you need to be aware of following:

1. Performance Agent 5.00 does not support ESX 2.5, ESX 3.0 and ESX 3.5. Performance Agent 4.70 supported the above mentioned environments.
2. Performance Agent 5.00 supports ESX 3.5 U2 onwards (i.e. ESX 3.5 U2 and ESX4). This means Performance Agent 5.00 can collect data from hosts which are at minimum ESX 3.5 U2.
3. If you are managing ESX 3.5 environments with Performance Agent 4.70, you need to move to update 2 (U2) to be able to manage it with Performance Agent 5.00.
4. With Performance Agent 5.00, you can manage several of ESX hosts with one instance of Performance Agent 5.00.
5. Performance Agent 5.00 can NOT be installed on the ESX console and can only be installed on vMA system available in ESX 3.5 U2 or ESX4.

Migration scenarios for various Environments

Following are the possible migration scenarios for various environments. These might change according to your environment. Make sure that you take back up of data collected by Performance Agent 4.70 as this will not be an upgrade from Performance Agent 4.70 to Performance Agent 5.00. (Performance Agent 4.70 runs on ESX console and Performance Agent 5.00 is NOT supported on ESX console).

Scenario 1

Environment: ESX 3.5 only, Performance Agent 4.70 on Host only (console)

To migrate, follow these steps:
1. Update one of ESX 3.5 host to ESX 3.5 U2 (if you have not updated one yet)
2. Create a vMA system on the ESX host. Register the ESX host (on which vMA is hosted) with vMA.
3. Remove Performance Agent 4.70 (from console) and install Performance Agent 5.00 in vMA. Check Performance Agent 5.00 data about the ESX host where vMA is running.
4. Register remaining ESX hosts on vMA and starting seeing their data in Performance Agent 5.00.
5. Remove Performance Agent 4.70 from all the remaining ESX host consoles.

Scenario 2

Environment: ESX 3.0.x, ESX 3.5 and ESX 4, Performance Agent 4.70 on ESX 3.0, ESX 3.5 Host only

To migrate, follow these steps:
1. Update all ESX 3.5 hosts to ESX 3.5 U2.
2. Create vMA on ESX 4 host (you can also create on ESX 3.5 U2 host) and register ESX hosts (ESX 3.5 U2 and above) in your environment on vMA.
3. Install Performance Agent 5.00 on vMA.
4. Start collecting data about all ESX 3.5 U2 hosts and guests in your environment, via Performance Agent 5.00.
5. Remove Performance Agent 4.70 installation from ESX 3.5 U2 hosts (console).
6. You will need to manage ESX 3.0.x with Performance Agent 4.70 only. Performance Agent 5.00 does not collect data from this host.

Scenario 3

Environment: ESX 3.5 only, Performance Agent 4.7 on Host and guest systems

To migrate, follow these steps:
1. Follow all the steps as mentioned in Scenario1.
2. Upgrade Performance Agent 4.70 on guests to Performance Agent 5.00.

NOTE: It is possible that both Performance Agent 4.70 and Performance Agent 5.00 are running in your environment. For example, you can manage guest systems with Performance Agent 4.70 and get physical metrics about ESX hosts, guest and Resource Pool (RP) using Performance Agent 5.00 (BYLS metrics).

If you have an ESX environment which is not covered in the above mentioned environments, typically some of the above migration scenarios might apply to you as well.

Special Instructions for monitoring ESX environment with Performance Agent on vMA

Some special instructions for monitoring ESX environment with Performance Agent on vMA are as follows:

- **To enable root privileges, login to vMA with vi-admin login and type the following commands:**

    $ sudo bash

    < provide the password>

    #

- **To register with vMA all the ESX/ESXi hosts that you would like to monitor, type the following commands:**

    #vifp addserver <ESX/ESXi hostname>

    #vifp listservers

    (This shows the ESX/ESXi hosts is registered with vMA)

    - For more details, type the following:

        #vifp help

- **If you are deploying Operations Agent/ Performance Agent on vMA from Management server, follow these steps:**

    By default, vMA does not open the port 383 required for communication between vMA and HP Operations Manager (OM).

    - To open the ports on vMA, type the following command:

        #service iptables stop (not recommended)

    OR

        #sudo iptables -I RH-Firewall-1-INPUT 3 -p tcp -m tcp --dport 383 --tcp-flags

        SYN, RST, ACK SYN -j ACCEPT

        # iptables-save (for saving this across reboots)

- **To make sure that portmap service is enabled, follow these steps:**

    - To check whether portmap is enable or not, run the following command:

        chkconfig --list portmap

- To enable portmap, execute the following command:

    chkconfig --level 2 portmap on

- Enable it for other 3, 4 and 5 levels as well. After enabling, it displays as follows:

    # chkconfig --list portmap

    portmap   0:off   1:off   2:on   3:on   4:on   5:on   6:off

- **To disable floppy drive, follow these steps:**

  1. Connect to the ESX Server hosting vMA 4.0 using VI infrastructure client.
  2. Select the vMA 4.0.
  3. Select Summary tab and click **Edit Settings-> Options tab-> Boot Options**.
  4. Enable Force BIOS setup screen.
  5. Reboot vMA. It haltsat BIOS setup.
  6. Disable floppy drive.

vMA related information

- For vMA related information, see the following URL:
  - http://www.vmware.com/support/developer/vima/

  - **Note:** Performance Agent 5.00 supports only vMA 4.0 and does not support vMA 1.0.

- The Performance and Scalability Guide for Performance Agent 5.00 on vMA is available at:
  - http://h20230.www2.hp.com/selfsolve/manuals

  - **Note:** This site requires that you register for an HP Passport and sign in.

  - To register for an HP Passport ID, go to:
  - http://h20229.www2.hp.com/passport-registration.html

  - Or click the New users - please register link on the HP Passport login page.

- There is a white paper "Monitoring ESX/ESXi environment with Performance Agent/Glance 5.0" which provides deeper level of information for using PA to monitor ESX/ESXi environment. Please check the above link or contact HP support for the same.

- There is a document about PI support for PA 5.0. Please contact HP support for the same.

Performance Agent 4.70 BYLS metrics

BYLS_CPU_ENTL_EMIN

BYLS_CPU_ENTL_MAX

BYLS_CPU_ENTL_MIN

BYLS_CPU_ENTL_UTIL

BYLS_CPU_PHYSC

BYLS_CPU_PHYS_TOTAL_TIME

BYLS_CPU_PHYS_TOTAL_UTIL

BYLS_CPU_SHARES_PRIO

BYLS_DISPLAY_NAME

BYLS_IP_ADDRESS

BYLS_LS_ID

BYLS_LS_MODE

BYLS_LS_NAME

BYLS_LS_SHARED

BYLS_LS_STATE

BYLS_LS_UUID

BYLS_MEM_ENTL

BYLS_MEM_ENTL_MAX

BYLS_MEM_ENTL_MIN

BYLS_MEM_ENTL_UTIL

BYLS_MEM_OVERHEAD

BYLS_MEM_PHYS_UTIL

BYLS_MEM_SHARES_PRIO

BYLS_MEM_SWAPPED

BYLS_NUM_CPU

BYLS_NUM_DISK

BYLS_NUM_NETIF

BYLS_UPTIME_SECONDS

Performance Agent 4.70 additional metrics on Guest

GBL_LS_TYPE

GBL_LS_ROLE

GBL_LS_ID

GBL_LS_MODE

GBL_LS_SHARED

GBL_CPU_ENTL_MIN

GBL_CPU_CYCLE_ENTL_MIN

GBL_CPU_CYCLE_ENTL_MAX

GBL_CPU_SHARES_PRIO

GBL_CPU_ENTL_UTIL

GBL_CPU_PHYS_TOTAL_UTIL

GBL_CPU_PHYSC

GBL_MEM_ENTL_MI

GBL_MEM_ENTL_MAX

GBL_MEM_SHARES_PRI

GBL_MEM_PHYS_SWAPPED

GBL_MACHINE_MEM_USED

GBL_MEM_OVERHEAD

GBL_CPU_ENTL_MAX

Performance Agent 5.00 BYLS metrics

	Supported on ESX Server			Description
	Host	**Guest**	**Resource Pool**	
BYLS_LS_ID	Y	Y	Y	This is a unique identifier for a host, resource pool and a guest. The value of this metric may change for an instance across collection intervals.
BYLS_LS_NAME	Y	Y	Y	This is a unique identifier for a host, resource pool and a guest. The value of this metric remains the same, for an instance, across collection intervals.
BYLS_LS_STATE	Y	Y	N	The state of host and guest.
BYLS_LS_OSTYPE	Y	Y	N	The OS that a guest is hosting. The values could be: ESXSrv (applicable only for a host) Linux Windows Solaris Unknown (if not recognized by PA)
BYLS_NUM_CPU	Y	Y	N	The number of virtual CPUs configured for a guest
BYLS_NUM_DISK	Y	Y	N	The number of disks configured for a guest
BYLS_NUM_NETIF	Y	Y	N	The number of network interfaces configured for a guest
BYLS_CPU_ENTL_MIN	Y	Y	Y	The minimum CPU units configured. For a host, the metric is equivalent to total number of cores on the host. For a Guest and resource pool it indicates the minimum CPU units reserved
BYLS_CPU_ENTL_MAX	Y	Y	Y	The maximum CPU units configured. For a host, the metric is equivalent to total number of cores on the host. For a Guest and resource pool it indicates the maximum CPU units reserved
BYLS_UPTIME_SECONDS	Y	Y	N	The uptime of the host and guest in seconds
BYLS_LS_MODE	Y	Y	Y	This metric indicates whether the CPU entitlement is Capped or Uncapped
BYLS_LS_SHARED	Y	Y	Y	This metric indicates whether the physical CPUs are dedicated to a guest or shared
BYLS_DISPLAY_NAME	Y	Y	Y	This name of the host, guest, resource pool
BYLS_MEM_ENTL	Y	Y	N	The minimum memory configured for Host and Guest
BYLS_CPU_SHARES_PRIO	N	Y	Y	The CPU shares allocated to a guest

	Supported on ESX Server			Description
	Host	**Guest**	**Resource Pool**	
				and resource pool
BYLS_CPU_PHYS_TOTAL_UTIL	Y	Y	Y	The percentage of total time the physical CPUs were utilized by guest, host and resource pool
BYLS_MEM_ENTL_UTIL	Y	Y	Y	The percentage of entitled memory in use during the interval. It is memory usage calculated w.r.t BYLS_MEM_ENTL_MIN
BYLS_LS_UUID	Y	Y	Y	UUID of Host and Guest. For resource pool it is a namespace that uniquely identifies a resource pool
BYLS_CPU_TOTAL_UTIL	Y	Y	N	
BYLS_CPU_USER_MODE_UTIL	Y	N	N	
BYLS_CPU_SYS_MODE_UTIL	Y	N	N	
BYLS_CPU_PHYSC	Y	Y	Y	The number of CPU units utilized by the Host, Guest and Resource pool
BYLS_CPU_ENTL_UTIL	Y	Y	Y	The Percentage of entitled processing units (guaranteed processing units allocated to this logical system) consumed by the host, guest and resource pool. i.e cpu usage calculated w.r.t (BYLS_CPU_ENTL_MIN)
BYLS_CPU_MT_ENABLED	Y	N	N	Indicates whether the CPU hardware threads are enabled
BYLS_CPU_PHYS_USER_MODE_UTIL	Y	Y	N	The percentage of time the physical CPUs were in user mode for the host and guest during the interval
BYLS_CPU_PHYS_SYS_MODE_UTIL	Y	Y	N	The percentage of time the physical CPUs were in system mode for the host and guest during the interval
BYLS_IP_ADDRESS	Y	Y	N	The IP Address of the host, guest
BYLS_MEM_ENTL_MIN	Y	Y	Y	The reserved memory configured, in MB, for host, guest and resource pool
BYLS_MEM_ENTL_MAX	Y	Y	Y	The maximum amount of memory configured, in MB, for host, guest and resource pool
BYLS_MEM_SHARES_PRIO	N	Y	Y	The weightage/priority, for memory, assigned to a guest, resource pool
BYLS_MEM_OVERHEAD	Y	Y	N	Amount of overhead memory associated with Guest, Resource Pool due to virtualization
BYLS_MEM_SWAPPED	Y	Y	Y	The amount of memory that has been transparently swapped to disk
BYLS_MEM_PHYS_UTIL	Y	Y	Y	The percentage of physical memory used during the interval by host, guest and resource pool
BYLS_LS_PATH	N	Y	N	The installation path for a guest

	Supported on ESX Server			Description
	Host	**Guest**	**Resource Pool**	
BYLS_LS_HOSTNAME	Y	Y	N	
New BYLS Metrics added for 5.0				
BYLS_LS_HOST_HOSTNAME	N	Y	Y	The host name on which guest, resource pool is hosted
BYLS_LS_PARENT_UUID	N	Y	Y	UUID of the parent
BYLS_LS_PARENT_TYPE	N	Y	Y	Type of the Parent
BYLS_VC_IP_ADDRESS	Y	N	N	IP Address of the vSphere Center (Virtual Centre) that manages the host
BYLS_MEM_USED	Y	Y	Y	Amount of memory used in MB
BYLS_CPU_CYCLE_TOTAL_USED	Y	Y	Y	The total time the physical CPUs were utilized during the interval, represented in cpu cycles.
BYLS_MEM_BALLOON_UTIL	N	Y	N	Percentage of memory (w.r.t to BYLS_MEM_ENTL_MIN) held by memory control for ballooning
BYLS_MEM_BALLOON_USED	N	Y	N	Amount of memory held by memory control for ballooning
BYLS_CPU_UNRESERVED	Y	N	N	It is the number of CPU cycles that are available for creating new VMs
BYLS_CPU_PHYS_WAIT_UTIL	N	Y	N	The percentage of time, during the interval, that the virtual CPU was waiting for the IOs to complete.
BYLS_CPU_PHYS_READY_UTIL	N	Y	N	The percentage of time, during the interval, that the CPU was in ready state
BYLS_MEM_ACTIVE	N	Y	N	Amount of memory, that is actively used
BYLS_MEM_UNRESERVED	Y	N	N	Amount of memory that is unreserved.
BYLS_MEM_HEALTH	Y	N	N	A number that Indicates state of memory. Low number indicates there is less memory pressure
BYLS_MEM_SWAPTARGET	N	Y	N	The amount of memory that can be swapped.
BYLS_MEM_SWAPIN	N	Y	N	The amount of memory that is swapped in
BYLS_MEM_SWAPOUT	N	Y	N	The amount of memory that is swapped out
BYLS_NET_BYTE_RATE	Y	Y	N	The sum of data, in KBps, transmitted and received for all the NIC instances
BYLS_NET_IN_BYTE	Y	Y	N	The number of bytes received during the interval
BYLS_NET_OUT_BYTE	Y	Y	N	The number of bytes transmitted during the interval
BYLS_CLUSTER_NAME	Y	N	Y	The name of the cluster to which the host belongs to when it is managed by virtual centre
New Metrics to match with GBL				

	Supported on ESX Server			Description
	Host	**Guest**	**Resource Pool**	
BYLS_LS_ROLE	Y	Y	Y	Indicates if the instance is a host, guest or a resource pool
BYLS_LS_TYPE	Y	Y	Y	Type of virtualization technology
BYLS_NUM_CPU_CORE	Y	N	N	The total number of CPU cores on the system
BYLS_NUM_SOCKET	Y	N	N	Number of physical cpu sockets on the system
BYLS_MEM_FREE_UTIL	Y	Y	N	Percentage of unallocated memory represented w.r.t to BYLS_MEM_ENTL_MIN
BYLS_BOOT_TIME	Y	Y	N	The time when the system was booted
BYLS_MACHINE_MODEL	Y	N	N	CPU model of the host system
BYLS_MEM_AVAIL	Y	N	N	Amount of physical memory available for user processes
BYLS_MEM_PHYS (same as BYLS_MEM_ENTL)	Y	N	N	Amount of physical memory available in the system
BYLS_NUM_LS	Y	N	N	Total number of guests configured in a host
BYLS_NUM_ACTIVE_LS	Y	N	N	Total number of guests that are powered on in a host
BYLS_CPU_CYCLE_ENTL_MIN	Y	Y	Y	The minimum processor capacity, in MHz, configured for host, guest, resource pool
BYLS_CPU_CYCLE_ENTL_MAX	Y	Y	Y	The maximum processor capacity, in MHz, configured for host, guest, resource pool
BYLS_DISK_PHYS_READ_RATE	Y	Y	N	The number of physical reads per second during the interval.
BYLS_DISK_PHYS_READ	Y	Y	N	The number of physical reads during the interval.
BYLS_DISK_PHYS_WRITE_RATE	Y	Y	N	The number of physical writes per second during the interval.
BYLS_DISK_PHYS_WRITE	Y	Y	N	The number of physical writes during the interval.
BYLS_DISK_PHYS_BYTE_RATE	Y	Y	N	The average number of KBs per second at which data was transferred to and from disks during the interval
BYLS_DISK_PHYS_BYTE	Y	Y	N	The average number of KBs transferred to and from disks during the interval
BYLS_DISK_PHYS_READ_BYTE_RATE	Y	Y	N	The average number of KBs transferred from the disk per second during the interval
BYLS_DISK_PHYS_WRITE_BYTE_RATE	Y	Y	N	The average number of KBs transferred to the disk per second during the interval
BYLS_DISK_UTIL	Y	N	N	The average utilization of all disks
BYLS_NET_IN_PACKET_RAT	Y	Y	N	The number of successful packets

	Supported on ESX Server			Description
	Host	Guest	Resource Pool	
E				received per second through all network interfaces during the interval
BYLS_NET_IN_PACKET	Y	Y	N	The number of successful packets received through all network interfaces during the interval
BYLS_NET_OUT_PACKET_R ATE	Y	Y	N	The number of successful packets sent per second through all network interfaces during the interval
BYLS_NET_OUT_PACKET	Y	Y	N	The number of successful packets sent through all network interfaces during the interval
BYLS_NET_PACKET_RATE	Y	Y	N	The number of successful packets, both sent and received, per second, for all network interfaces during the interval
BYLS_MEM_SYS	Y	N	N	Amount of memory used by VMKernel during the interval

List of important Configuration files and their Purpose

Configuration File	Purpose
/var/opt/perf/parm	For log file (logls) size , Performance Agent logging interval related configurations
/var/opt/perf/viserver.properties	VIServer related configurations
/var/opt/perf/alarmdef	PA alarming related configuration

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