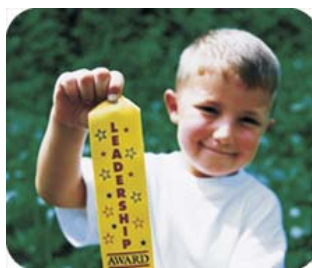




hp WBEM solutions



hp technical  
data sheet  
october 2002

## hp-ux process and process statistics CIM providers

### provider overview

#### description

The HP-UX Process and Process Statistics Providers make available basic UNIX process information such as name of the executable image, process ID, priority, execution state, and various process resource utilization statistics. In addition to implementing the properties of CIM\_Process, these providers implement the properties CIM\_UnixProcess and CIM\_UnixProcessStatisticalInformation in CIM v2.6 as PG\_UnixProcess and PG\_UnixProcessStatisticalInformation. Client applications can use this provider to give clients an understanding of the processes running on the Managed System within the context of its operating system.

#### requirements

The provider requires HP WBEM Services for HP-UX.

#### release history

Initial release with HP WBEM Services for HP-UX, version 1.1. Re-released with HP WBEM Services for HP-UX, version 1.1.

#### supported managed resources

Managed systems running HP WBEM Services for HP-UX.

### setting up this provider

#### installing this provider

The HP-UX Process and Process Statistics Providers are contained within a Process Provider Module (they are the only two providers within that module). The Provider Module is bundled with HP WBEM Services for HP-UX including:

- Schema MOF file: PG\_UnixProcess20.mof (in /etc/opt/wbem/mof)
- Provider registration MOF file: PG\_UnixProcess20R.mof (in /etc/opt/wbem/mof)
- Provider Module executable : libProcessProvider.sl (in /opt/wbem/providers/lib, and is the target of the /opt/wbem/lib/libProcessProvider.1 symbolic link)

The provider is registered to support the "root/cimv2" namespace as an instance provider. There are no special installation instructions; the providers will be installed by default with HP WBEM Services for HP-UX.

#### configuring this provider

These providers do not accept specific configuration adjustments (beyond standard WBEM support).

### using this provider

#### schema supported by this provider

This provider supports the CIM\_Process, PG\_UnixProcess, and PG\_UnixProcessStatisticalInformation classes. Tables 1 through 5 describe the properties and methods supported by the provider.

**table 1: CIM\_Process properties**

Table 1 describes the properties of the CIM\_Process class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property's value and data source. Each row describes a property.

<i>property name</i>	<i>property inheritance</i>	<i>property value (and data source)</i>
string Caption	Inherited from CIM_ManagedElement	<u>HP-UX</u> : Returns the first argument of the command line for the process.
string Description	Inherited from CIM_ManagedElement	<u>HP-UX</u> : Returns a string containing the entire command line for the process.
datetime InstallDate	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : Not implemented.
string CSCreationClassName [Key]	Inherited from CIM_Process. Propagated from CIM_OperatingSystem.CSCreationClassName.	<u>HP-UX</u> : Returns the string "CIM_UnitaryComputerSystem."
string CSName [Key]	Inherited from CIM_Process. Propagated from CIM_OperatingSystem.CSName.	<u>HP-UX</u> : Returns the fully qualified host name returned by the gethostbyname() system call. If a name service is not available, just uses the hostname return by the gethostname() system call.
string OSCreationClassName [Key]	Inherited from CIM_Process. Propagated from CIM_OperatingSystem.CreationClassName.	<u>HP-UX</u> : Returns the string "CIM_OperatingSystem."
string OSName [Key]	Inherited from CIM_Process. Propagated from CIM_OperatingSystem.Name.	<u>HP-UX</u> : Returns the value of sysname in the utsname structure returned by the uname() system call.
string Name	Inherited from CIM_ManagedSystemElement, overridden in CIM_Process.	<u>HP-UX</u> : Returns the base name of the executable image from the value of pst_ucomm in the pst_status structure returned by the pstat_getproc() system call.
string CreationClassName [Key]	Local to CIM_Process.	<u>HP-UX</u> : Returns the string "CIM_Process".
string Handle [Key]	Local to CIM_Process.	<u>HP-UX</u> : Returns the process ID, obtained from the value of pst_pid in the pst_status structure returned by the pstat_getproc() system call.
uint32 Priority	Local to CIM_Process.	<u>HP-UX</u> : Returns the process priority, obtained from the value of pst_pri in the pst_status structure returned by the pstat_getproc() system call.
uint16 ExecutionState	Local to CIM_Process.	<p><u>HP-UX</u>: Return value is based on the process state obtained from the value of pst_state in the pst_status structure returned by the pstat_getproc() system call. Mapped to ExecutionState as follows:</p> <ul style="list-style-type: none"> <li>• PS_SLEEP: 6 ("SuspendedReady")</li> <li>• PS_RUN: 3 ("Running")</li> <li>• PS_STOP: 8 ("Stopped")</li> <li>• PS_ZOMBIE: 1 ("Other")</li> <li>• PS_IDLE: 2 ("Ready")</li> <li>• PS_OTHER: 1 ("Other")</li> <li>• all other values: 0 ("Unknown")</li> </ul>

<i>property name</i>	<i>property inheritance</i>	<i>property value (and data source)</i>
string OtherExecutionDescription	Local to CIM_Process.	<u>HP-UX</u> : Returns the string "Zombie" for zombie (PS_ZOMBIE), "Other" for status "other" (PS_OTHER), and NULL for all other values of pst_state as described for ExecutionState above.
datetime CreationDate	Local to CIM_Process.	<u>HP-UX</u> : Returns the time the process started, obtained using the value of pst_start in the pst_status structure returned by the pstat_getproc() system call.
datetime TerminationDate	Local to CIM_Process.	<u>HP-UX</u> : Not implemented.
uint64 KernelModeTime	Local to CIM_Process.	<u>HP-UX</u> : Returns the system time spent executing, obtained from the value of pst_stime in the pst_status structure returned by the pstat_getproc() system call. pst_stime is multiplied by 1,000 to convert it to milliseconds.
uint64 UserModeTime	Local to CIM_Process.	<u>HP-UX</u> : Returns the user time spent executing, obtained from the value of pst_utime in the pst_status structure returned by the pstat_getproc() system call. pst_utime is multiplied by 1,000 to convert it to milliseconds.
uint64 WorkingSetSize	Local to CIM_Process.	<u>HP-UX</u> : Returns 0 (zero) indicating information is not available.

**table 2: PG\_UnixProcess properties**

Table 2 describes the properties of the PG\_UnixProcess class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property's value and data source. Each row describes a property.

The PG\_UnixProcess class inherits properties of superclass CIM\_Process (as described in Table 1 and not repeated here).

<b>property name</b>	<b>property inheritance</b>	<b>property value (and data source)</b>
string ParentProcessID	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the parent process ID, obtained from the value of pst_ppid in the pst_status structure returned by the pstat_getproc() system call.
uint64 RealUserID	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the real user ID, obtained from the value of pst_uid in the pst_status structure returned by the pstat_getproc() system call.
uint64 ProcessGroupID	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the real GID, obtained from the value of pst_gid in the pst_status structure returned by the pstat_getproc() system call.
uint64 ProcessSessionId	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the session ID, obtained from the value of pst_sid in the pst_status structure returned by the pstat_getproc() system call.
string ProcessTTY	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the full path name (for example /dev/tty1) of the TTY device which corresponds to the values of pst_major and pst_minor in the pst_status structure returned by the pstat_getproc() system call.
string ModulePath	Local to PG_UnixProcess.	<u>HP-UX</u> : Not supported. Note that Unix does not require placing the full path name in the first argument of the command line.
string Parameters	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the arguments of the command line (including the command itself). Parsed from the value of the pst_cmd string in the pst_status structure returned by the pstat_getproc() system call.
uint32 ProcessNiceValue	Local to PG_UnixProcess.	<u>HP-UX</u> : Returns the process nice value, obtained from the value of pst_nice in the pst_status structure returned by the pstat_getproc() system call.
string ProcessWaitingForEvent	Local to PG_UnixProcess.	<u>HP-UX</u> : Not implemented.

**table 3: intrinsic methods for CIM\_Process and PG\_UnixProcess**

Table 3 describes the intrinsic methods for CIM\_Process and PG\_UnixProcess supported by this provider. It has three columns. The first is the method name, the second is a description of the provider's actions based on invoking that method, and the third is a list of any exceptions that could result from invoking the method. Each row describes a method. Note that this provider supports no extrinsic methods.

<i>method name</i>	<i>description</i>	<i>exceptions thrown</i>
enumerateInstances	Returns all instances of class with all properties and respective values.	None
enumerateInstanceNames	Returns object path of all instances of class.	None
getInstance	Supported.	CIM_ERR_INVALID_PARAMETER if wrong class for a key. CIM_ERR_NOT_FOUND if wrong number of keys, or process is not found.
modifyInstance	Not supported.	CIM_ERR_NOT_SUPPORTED
deleteInstance	Not supported.	CIM_ERR_NOT_SUPPORTED
initialize	Not supported.	None.
terminate	Not supported.	None
createInstance	Not supported.	CIM_ERR_NOT_SUPPORTED

**table 4: PG\_UnixProcessStatisticalInformation Properties**

Table 4 describes the properties of the PG\_UnixProcessStatisticalInformation class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property's value and data source. Each row describes a property.

<i>property name</i>	<i>property inheritance</i>	<i>property value (and data source)</i>
string Caption	Inherited from CIM_ManagedElement	<u>HP-UX</u> : Returns the first argument of the command line for the process.
string Description	Inherited from CIM_ManagedElement	<u>HP-UX</u> : Returns a string containing the entire command line for the process.
string CSCreationClassName [Key]	Local to PG_UnixProcessStatisticalInformation. Propagated from CIM_Process.CSCreationClassName.	<u>HP-UX</u> : Always returns the string "CIM_UnitaryComputerSystem."
string CSName [Key]	Local to PG_UnixProcessStatisticalInformation. Propagated from CIM_Process.CSName.	<u>HP-UX</u> : Returns the fully qualified host name returned by the gethostbyname() system call. If a name service is not available, uses the hostname returned by the gethostname() system call.

<i>property name</i>	<i>property inheritance</i>	<i>property value (and data source)</i>
string OSCreationClassName [Key]	Local to PG_UnixProcessStatisticalInformation. Propagated from CIM_Process.OSCreationClassName.	<u>HP-UX</u> : Always returns the string "CIM_OperatingSystem".
string OSName [Key]	Local to PG_UnixProcessStatisticalInformation. Propagated from CIM_Process.OSName.	<u>HP-UX</u> : Returns the value of sysname in the utsname structure returned by the uname() system call.
string Handle [Key]	Inherited from CIM_Process.	<u>HP-UX</u> : Returns the process ID - the value of pst_pid in the pst_status structure returned by the pstat_getproc() system call.
string ProcessCreationClassName [Key]	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Always returns the string "CIM_Process".
string Name [Key]	Inherited from CIM_StatisticalInformation, overridden in PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns a string representing the current date/time used to make this set of statistics gathered for the process unique. Note when invoking getInstance, the value of the Name property is ignored in matching the instance.
uint32 CPUTime (in Percent)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the percentage of CPU time being consumed, obtained from the value of pst_pctcpu in the pst_status structure returned by the pstat_getproc() system call. pst_pctcpu is multiplied by 100 to convert it to percent.
uint64 RealText (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of real text space used by the process. Obtained by multiplying the value of pst_tsize (part of the pst_status structure returned by the pstat_getproc() system call) by the page size (returned by the getpagesize() system call), and then dividing it by 1,024 (1K).
uint64 RealData (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of real data space used by the process. Obtained by multiplying the value of pst_dsize (part of the pst_status structure returned by the pstat_getproc() system call) by the page size (returned by the getpagesize() system call), and then dividing it by 1,024 (1K).
uint64 RealStack (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of real stack space used by the process. Obtained by multiplying the value of pst_ssize (part of the pst_status structure returned by the pstat_getproc() system call) by the page size (returned by the getpagesize() system call), and then dividing it by 1,024 (1K).
uint64 VirtualText (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of virtual text space used by the process. Obtained by multiplying the value of pst_vtsize (part of the pst_status structure returned by the pstat_getproc() system call) by the page size (returned by the getpagesize() system call), and then dividing it by 1,024 (1K).

<i>property name</i>	<i>property inheritance</i>	<i>property value (and data source)</i>
uint64 VirtualData (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of virtual data space used by the process. Obtained by multiplying the value of <code>pst_vdsize</code> (part of the <code>pst_status</code> structure returned by the <code>pstat_getproc()</code> system call) by the page size (returned by the <code>getpagesize()</code> system call), and then dividing it by 1,024 (1K).
uint64 VirtualStack (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of virtual stack space used by the process. Obtained by multiplying the value of <code>pst_vssize</code> (part of the <code>pst_status</code> structure returned by the <code>pstat_getproc()</code> system call) by the page size (returned by the <code>getpagesize()</code> system call), and then dividing it by 1024 (1K).
uint64 VirtualMemoryMappedFileSize (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of memory used for memory mapped files. Obtained by multiplying the value of <code>pst_vmmsize</code> (part of the <code>pst_status</code> structure returned by the <code>pstat_getproc()</code> system call) by the page size (returned by the <code>getpagesize()</code> system call), and then dividing it by 1024 (1K).
uint64 VirtualSharedMemory (in KiloBytes)	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Returns the kilobytes of virtual shared memory. Obtained by multiplying the value of <code>pst_vshmsize</code> (part of the <code>pst_status</code> structure returned by the <code>pstat_getproc()</code> system call) by the page size (returned by the <code>getpagesize()</code> system call), and then dividing it by 1024 (1K).
uint64 CpuTimeDeadChildren	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Not implemented.
uint64 SystemTimeDeadChildren	Local to PG_UnixProcessStatisticalInformation.	<u>HP-UX</u> : Not implemented.
uint64 RealSpace	Local to PG_UnixProcessStatisticalInformation. (Note this property has not been recommended for inclusion with the proposed CIM_UnixProcessStatisticalInformation class.)	<u>HP-UX</u> : Returns the total real space used by the process. Calculated by summing <code>pst_tsize</code> , <code>pst_dsize</code> , and <code>pst_ssize</code> from the <code>pst_status</code> structure returned by the <code>pstat_getproc()</code> system call, multiplying the sum by the page size (returned by the <code>getpagesize()</code> system call), and then dividing it by 1,024 (1K).

**table 5: intrinsic methods for PG\_UnixProcessStatisticalInformation**

Table 5 describes the intrinsic methods for PG\_UnixProcessStatisticalInformation supported by this provider. It has three columns. The first is the method name, the second is a description of the provider's actions based on invoking that method, and the third is a list of any exceptions that could result from invoking the method. Each row describes a method. Note that this provider supports no extrinsic methods.

<i>method name</i>	<i>description</i>	<i>exceptions thrown</i>
enumerateInstances	Returns all instances of class with all properties and respective values.	None
enumerateInstanceNames	Returns object path of all instances of class.	None
getInstance	Supported. Note when invoking getInstance, the value of Name, while required, is ignored. This is because statistical information is extremely dynamic, so the value of name (a time stamp) will have changed between in invocation of enumerateInstanceNames and a subsequent getInstance.	CIM_ERR_INVALID_PARAMETER if wrong class for a key. CIM_ERR_NOT_FOUND if wrong number of keys, or process is not found.
modifyInstance	Not supported.	CIM_ERR_NOT_SUPPORTED
deleteInstance	Not supported.	CIM_ERR_NOT_SUPPORTED
initialize	Not supported.	None.
terminate	Not supported.	None
createInstance	Not supported.	CIM_ERR_NOT_SUPPORTED

- **Indications generated by this provider**  
This provider does not currently generate any indications.
- **Associations provided by this provider**  
This provider does not currently support any associations.

## links to more information

- **Additional HP WBEM solution data**  
<http://www.hp.com/large/infrastructure/management/wbem/>
- **Additional provider documentation**  
There is currently no additional documentation for this provider beyond this information. See also man pages for information on the various commands and system calls noted in the descriptions above.
- **WBEM information**  
For a CIM tutorial, go to <http://www.dmtf.org/education/cimtutorial.php>.  
For information about HP WBEM Services for HP-UX, see [software.hp.com](http://software.hp.com) and [hp.com](http://hp.com) (the Network and Systems Management areas).
- **Managed Resource Documentation**  
See also the HP-UX man page for psat(2) and other system calls as referenced in the descriptions above.
- **Client Information**  
None.
- **Support Contacts**  
The HP-UX Process and Process Statistics Providers are supported as part of HP WBEM Services for HP-UX.

For additional information on HP products and services, visit us at [www.hp.com](http://www.hp.com)

For the location of the nearest sales office, call:

United States: +1 800 637 7740

Canada: +1 905 206 4725

Japan: +81 3 3331 6111

Latin America: +1 305 267 4220

Australia/New Zealand: +61 3 9272 2895

Asia Pacific: +8522 599 7777

Europe/Africa/Middle East: +41 22 780 81 11

For more information, contact any of our worldwide sales offices or HP Channel Partners (in the U.S. call 1 800 637 7740).

Technical information contained in this document is subject to change without notice.

© Copyright Hewlett-Packard Company 2002

10/2002

