# Providers for Linux and UNIX

System Center 2012 Operations Manager

**Microsoft Corporation**
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# Table of Contents

# 1 Introduction

Welcome to the Providers for Linux and UNIX, a set of CMPI providers for Linux and UNIX operating systems as used in System Center 2012 Operations Manager. This document describes the classes, properties, and methods implemented by these providers.

## 1.1 License

The Providers for Linux and UNIX are published under the Microsoft Public License, which is described here http://opensource.org/licenses/ms-pl.html.

## 1.2 Platforms

The Providers for Linux and UNIX have been tested on the following operating systems:

- HP-UX 11i v2 and v3 (PA-RISC and IA64)
- Oracle Solaris 9 (SPARC), Solaris 10 (SPARC and x86), and Solaris 11 (SPARC and x86)
- Red Hat Enterprise Linux 4, 5, and 6 (x86/x64)
- SUSE Linux Enterprise Server 9 (x86), 10 SP1 (x86/x64), and 11 (x86/64)
- IBM AIX 5.3, 6.1, and 7.1 (POWER)

## 1.3 The CMPI Standard

The Providers for Linux and UNIX implement the Common Manageability Programming Interface (CMPI) standard. They are compatible with CIM servers that implement this standard, described here http://www.opengroup.org/bookstore/catalog/c061.htm. They have only been tested with the OpenPegasus CMPI interface, although they may work with other CMPI-compliant CIM servers as well.

## 1.4 Installing and Using the Providers

Details on unpacking the source code, building the providers, and creating a working version of the Operations Manager agent for Linux and UNIX is described in a separate document entitled Building Linux UNIX Agents.pdf. That document is available for download on the http://scx.codeplex.com site.

# 2 Provider Classes

This chapter discusses the CIM classes and methods implemented by XPlatProviders. See `scx.mof`, located in the MOF installation directory (`--mofdir`) for more details.

## 2.1 SCX_Agent

There is a single instance of this class. It provides information about the XPlatProviders package and the system it is installed on. The following instance was obtained from a Suse 10.1 system.

```
Architecture=x86
BuildDate=2009-06-29T00:00:00Z
BuildNumber=1
Caption=SCX Agent meta-information
Description=XPlatProviders_Build - 20090629
Hostname=scxcore-suse01.scx.com
InstallDate=2009-06-29T10:14:37Z
KitVersionString=1.0.0-001
MajorVersion=1
MinActiveLogSeverityThreshold=INFO
MinorVersion=0
Name=scx
OSAlias=SLES
OSName=SUSE Linux Enterprise Server
OSType=Linux
OSVersion=10.1
RevisionNumber=0
UnameArchitecture=i686
VersionString="1.0.0-1"
MachineType=Virtual
PhysicalProcessors=2
LogicalProcessors=4
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.1.1 Name

This key property uniquely identifies the single instance of this class. The value is always "scx", which stands for "System-Center X-Platform".

### 2.1.2 Caption

A human readable name for this instance.

### 2.1.3 Description

The build date of XPlatProviders.

### 2.1.4 VersionString

The version of XPlatProviders (major, minor, revision, and build number).

### 2.1.5 MajorVersion

The major version number of the XPlatProviders package.

### 2.1.6 MinorVersion

The minor version number of the XPlatProviders package.

### 2.1.7 RevisionNumber

The revision number of the XPlatProviders package.

### 2.1.8 BuildNumber

The build number of the XPlatProviders package.

### 2.1.9 BuildDate

The build date of the XPlatProviders package.

### 2.1.10 Architecture

The system architecture (e.g., `x86` or `IA64`)

### 2.1.11 OSName

The system's operating system type (e.g., Linux or SunOS)

### 2.1.12 OSType

The system operating system version (e.g. 10 or 5.10)

### 2.1.13 OSVersion

The system operating system version (e.g. 10 or 5.10)

### 2.1.14 KitVersionString

A string representing the complete software version of the installed kit.

### 2.1.15 Hostname

The hostname of the machine (including domain name if available).

### 2.1.16 OSAlias

Short name version of the OSName that provides an abbreviated name of OS without formatting.

### 2.1.17 UnameArchitecture

Output of `uname -m` or `uname -p`.

### 2.1.18 MinActiveLogSeverityThreshold

Lowest log severity threshold currently in use in the agent, which is one of the following: "HYSTERICAL", "TRACE", "INFO", "WARNING", "ERROR", "SUPPRESS".

### 2.1.19 MachineType

An indicator of whether the hardware running the monitored operating system is physical or virtual. Possible values of this field are: Physical, Virtual, and Unknown.

### 2.1.20 PhysicalProcessors

The number of physical processors in the hardware, as seen by the monitored operating system.

### 2.1.21 LogicalProcessors

The number of logical processors in the hardware, as seen by the monitored operating system.

## 2.2 SCX_DiskDrive

Each instance of this class provides information about a disk drive attached to the current system. A typical instance looks like this.

```
EnabledState = 5
RequestedState = 12
EnabledDefault = 2
SystemCreationClassName = "SCX_ComputerSystem"
SystemName = "scxcore-suse01.scx.com"
CreationClassName = "SCX_DiskDrive"
DeviceID = "sda"
MaxMediaSize = 17179869184
Caption = "Disk drive information"
Description = "Information pertaining to a physical unit of secondary storage"
Name = "sda"
IsOnline = TRUE
InterfaceType = "SCSI"
Model = ""
TotalCylinders = 2088
TotalHeads = 255
TotalSectors = 63
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.2.1 Caption

A human readable caption for this disk.

### 2.2.2 Description

A textual description of this disk.

### 2.2.3 Name

A unique key property that uniquely identifies this disk.

### 2.2.4 IsOnline

True if the disk is online.

### 2.2.5 InterfaceType

Type of interface (e.g., SCSI, IDE).

### 2.2.6 Manufacturer

Name of the disk manufacturer if available.

### 2.2.7 Model

Model of the disk if available.

### 2.2.8 TotalCylinders

Total number of cylinders on this disk.

### 2.2.9 TotalHeads

Total number of heads on this disk.

### 2.2.10 TotalSectors

Total number of sectors on this disk.

### 2.2.11 TotalTracks

Total number of tracks on this disk.

### 2.2.12 TracksPerCylinder

The number of tracks per cylinder if available.

### 2.2.13 RemoveByName()

```
boolean SCX_DiskDrive.RemoveByName(
    [IN] string Name)
```

Remove the disk with the given `Name` from the list of monitored disks.

## 2.3 SCX_FileSystem

Each instance of this class provides information about a file system on this computer. Here is an example instance obtained from a Linux system. This instance represents the root file system.

```
EnabledState = 5;
RequestedState = 12;
EnabledDefault = 2;
CSCreationClassName = "SCX_ComputerSystem";
CSName = "scxcore-suse01.scx.com";
CreationClassName = "SCX_FileSystem";
Name = "/";
Root = "/";
BlockSize = 4096;
FileSystemSize = 16376020992;
AvailableSpace = 6574993408;
ReadOnly = FALSE;
EncryptionMethod = "Not Encrypted";
CompressionMethod = "Not Compressed";
CaseSensitive = TRUE;
CasePreserved = TRUE;
MaxFileNameLength = 255;
FileSystemType = "reiserfs";
PersistenceType = 2;
Caption = "File system information";
Description = "Information about a logical unit of secondary storage";
IsOnline = TRUE;
TotalInodes = 2048000
FreeInodes = 1984563
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.3.1 Caption

A human-readable caption for this instance.

### 2.3.2 Description

A human-readable description of this instance.

### 2.3.3 IsOnline

True if this file system is online (mounted).

### 2.3.4 TotalInodes

The total number of inodes allocated in this file system. A value of zero indicates that this file system does not have a preset number of inodes.

### 2.3.5 FreeInodes

The number of inodes in this file system that are currently free and hence available for creating a new file.

### 2.3.6 RemoveByName

```
boolean RemoveByName(
    [IN] string Name)
```

Removes from the list of monitored file systems.

## 2.4 SCX_LogFile

Each instance of this class provides information about a 'log' file, on which `SCX_LogFile.GetMatchedRows()` has been called. It defines a single static method, described below.

### 2.4.1 GetMatchedRows

```
uint32 GetMatchedRows(
    [IN] string filename,
    [IN] string regexps[],
    [IN] string qid,
    [OUT, ArrayType("Ordered")] string rows[]);
```

Gets rows from the named file that match any of the supplied regular expressions. On the first invocation, it returns all matching lines in the file. On subsequent calls, only lines that appeared since the previous call are returned. After the first call, a CIM instance of `SCX_LogFile` is created. To begin where the previous call left off, you must pass in exactly he same values for the `filename`, `regexps`, and `qid` parameters.

## 2.5 SCX_UnixProcess

Each instance of this class provides information about a Unix (or Linux) process. The following instance provides information about the Unix `init` process obtained from a Linux system.

```
EnabledState = 5
RequestedState = 12
EnabledDefault = 2
CSCreationClassName = "SCX_ComputerSystem"
CSName = "scxcore-suse01.scx.com"
OSCreationClassName = "SCX_OperatingSystem"
OSName = "SuSE Distribution"
CreationClassName = "SCX_UnixProcess"
Handle = "1"
Name = "init"
Priority = 76
ExecutionState = 6
CreationDate = "20090416105118.035100-420"
KernelModeTime = 19300
UserModeTime = 2000
ParentProcessID = "0"
RealUserID = 0
ProcessGroupID = 0
ProcessSessionID = 0
ModulePath = "/sbin/init"
Parameters = "init [3]"
ProcessNiceValue = 20
ProcessWaitingForEvent = "_stext"
Caption = "Unix process information"
Description = "A snapshot of a current process"
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.5.1 Caption

A human-readable caption for this instance.

### 2.5.2 Description

A human-readable description of this instance.

### 2.5.3 TopResourceConsumers()

```
string TopResourceConsumers(
    [IN] string resource,
    [IN] uint16 count)
```

Returns a list of processes that are the top `count` consumers of the given `resource`. The `resource` parameter is one of the following.

- `"CPUTime"`

- "BlockReadsPerSecond"
- "BlockWritesPerSecond"
- "BlockTransfersPerSecond"
- "PercentUserTime"
- "PercentPrivilegedTime"
- "UsedMemory"
- "PercentUsedMemory"
- "PagesReadPerSec"

The returned string is formatted with one process per line (includes the `pid` and process name).

The following call, finds the top 10 consumers of memory.

```
TopResourceConsumers("UsedMemory", 10)
```

## 2.6 SCX_IPProtocolEndpoint

Each instance of this class provides information about an IP protocol endpoint. The following instance provides information about Ethernet interface `eth1`.

```
ElementName = "eth1"
RequestedState = 12
EnabledDefault = 2
SystemCreationClassName = "SCX_ComputerSystem"
SystemName = "scxcore-suse01.scx.com"
CreationClassName = "SCX_IPProtocolEndpoint"
EnabledState = 2
Name = "eth1";
IPv4Address = "10.195.173.73"
SubnetMask = "255.255.254.0"
ProtocolIFType = 4096
Caption = "IP protocol endpoint information"
Description = "Properties of an IP protocol connection endpoint"
IPv4BroadcastAddress = "10.195.173.255"
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.6.1 Caption

A human-readable caption for this instance.

### 2.6.2 Description

A human-readable description of this instance.

### 2.6.3 IPv4BroadcastAddress

The IPV4 broadcast IP for this ProtocolEndpoint.

## 2.7 SCX_OperatingSystem

The instance of this class represents the operating system on the current system. The following instance was obtained from a Linux Suse 10.1 system.

```
Caption = "SUSE Linux Enterprise Server 10 (i586)"
Description = "SUSE Linux Enterprise Server 10 (i586)"
EnabledState = 5
RequestedState = 12
EnabledDefault = 2
CSCreationClassName = "SCX_ComputerSystem"
CSName = "scxcore-suse01.scx.com"
CreationClassName = "SCX_OperatingSystem"
Name = "SuSE Distribution"
OSType = 36
OtherTypeDescription = "2.6.16.54-0.2.8-smp #1 SMP Mon Jun 23 13:41:12 UTC 2008"
Version = "2.6.16.54-0.2.8-smp"
LastBootUpTime = "20090416105118.029909-420"
LocalDateTime = "20090610135832.699909-420"
CurrentTimeZone = -420
NumberOfLicensedUsers = 0
NumberOfUsers = 13
NumberOfProcesses = 114
MaxNumberOfProcesses = 8192
TotalSwapSpaceSize = 778240
TotalVirtualMemorySize = 1292288
FreeVirtualMemory = 1157120
FreePhysicalMemory = 386048
TotalVisibleMemorySize = 514048
SizeStoredInPagingFiles = 778240
FreeSpaceInPagingFiles = 771072
MaxProcessMemorySize = 0
MaxProcessesPerUser = 4096
OperatingSystemCapability = "32 bit"
SystemUpTime = 4763234
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.7.1 Caption

A human-readable caption for this instance.

### 2.7.2 Description

A human-readable description of this instance.

### 2.7.3 OperatingSystemCapability

The capability of this operating system, either `'32 bit'` or `'64 bit'`.

### 2.7.4 SystemUpTime

The elapsed time, in seconds, since the OS was booted. A convenience property, versus having to calculate the time delta from `LastBootUpTime` to `LocalDateTime`.

### 2.7.5 ExecuteCommand()

```
boolean ExecuteCommand(
    [IN] string Command,
    [OUT] sint32 ReturnCode,
    [OUT] string StdOut,
    [OUT] string StdErr,
    [IN] uint32 timeout)
```

Execute a command, with the option of terminating the command after a timeout specified in seconds. Never times out if `timeout` is zero.

### 2.7.6 ExecuteShellCommand()

```
boolean ExecuteShellCommand(
    [IN] string Command,
    [OUT] sint32 ReturnCode,
    [OUT] string StdOut,
    [OUT] string StdErr,
    [IN] uint32 timeout)
```

Execute a command in the default shell, with the option of terminating the command after a timeout specified in seconds. Never times out if `timeout` is zero.

### 2.7.7 ExecuteScript()

```
boolean ExecuteScript(
    [IN] string Script,
    [IN] string Arguments,
    [OUT] sint32 ReturnCode,
    [OUT] string StdOut,
    [OUT] string StdErr,
    [IN] uint32 timeout)
```

Execute a script, with the option of terminating the script after a timeout specified in seconds. Never times out if `timeout` is zero.

## 2.8 SCX_StatisticalInformation

This is a base class for two other classes defined below. It defines one local property defined below. See the superclass for a description of inherited features.

### 2.8.1 IsAggregate

True if data is aggregated from several instances.

## 2.9 SCX_ProcessorStatisticalInformation

Instances of this class capture statistical information about processors on the current system. An instance is defined for each processor and an additional instance is defined that

aggregates statistical information about all processors. The following instance was obtained from a dual-processor Linux system and has statistical information about the first processor.

```
IsAggregate = FALSE
Caption = "Processor information"
Description = "CPU usage statistics"
Name = "0"
PercentIdleTime = 0
PercentUserTime = 0
PercentNiceTime = 0
PercentPrivilegedTime = 0
PercentInterruptTime = 0
PercentDPCTime = 0
PercentProcessorTime = 100
PercentIOWaitTime = 0
```

A second instance has the following properties.

```
IsAggregate = FALSE
Caption = "Processor information"
Description = "CPU usage statistics"
Name = "1"
PercentIdleTime = 0
PercentUserTime = 0
PercentNiceTime = 0
PercentPrivilegedTime = 0
PercentInterruptTime = 0
PercentDPCTime = 0
PercentProcessorTime = 100
PercentIOWaitTime = 0
```

And finally, a third instance aggregates these two instances and is shown below (note that `IsAggregate` is `TRUE`).

```
IsAggregate = TRUE
Caption = "Processor information"
Description = "CPU usage statistics"
Name = "_Total"
PercentIdleTime = 0
PercentUserTime = 0
PercentNiceTime = 0
PercentPrivilegedTime = 0
PercentInterruptTime = 0
PercentDPCTime = 0
PercentProcessorTime = 100
PercentIOWaitTime = 0
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.9.1 `Caption`

A human-readable caption for this instance.

### 2.9.2 Description

A human-readable description of this instance.

### 2.9.3 Name

This key property uniquely identifies this instance. It holds the processor number.

### 2.9.4 PercentIdleTime

Percentage of time during the sample interval that the processor was idle.

### 2.9.5 PercentUserTime

Percentage of non-idle processor time spent in user mode.

### 2.9.6 PercentNiceTime

Percentage of non-idle processor time spent in user mode.

### 2.9.7 PercentPrivilegedTime

Percentage of non-idle processor time spent in privileged.

### 2.9.8 PercentDPCTime

Percentage of time spent receiving and servicing DPC (Deferred Procedure Calls).

### 2.9.9 PercentProcessorTime

Percentage of time that the processor spent executing a non-idle thread.

### 2.9.10 PercentIOWaitTime

Percentage of time that the processor spent waiting for IO operations to complete.

## 2.10 SCX_MemoryStatisticalInformation

A single instance of this class provides memory statistics for the current system. The following instance was obtained from a Linux system.

```
IsAggregate = TRUE
Caption = "Memory information"
Description = "Memory usage and performance statistics"
Name = "Memory"
AvailableMemory = 378
PercentAvailableMemory = 75
UsedMemory = 124
PercentUsedMemory = 25
PagesPerSec = 0
PagesReadPerSec = 0
PagesWrittenPerSec = 0
AvailableSwap = 753
PercentAvailableSwap = 99
UsedSwap = 7
PercentUsedSwap = 1
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.10.1 Caption

A human-readable caption for this instance.

### 2.10.2 Description

A human-readable description of instance.

### 2.10.3 Name

This key property uniquely identifies the memory instance.

### 2.10.4 AvailableMemory

Available physical memory in megabytes.

### 2.10.5 PercentAvailableMemory

Available physical memory in percent.

### 2.10.6 UsedMemory

Used physical memory in megabytes.

### 2.10.7 PercentUsedMemory

Used physical memory in percent.

### 2.10.8 PagesPerSec

Pages read or written from/to disk per second to resolve hard page faults.

### 2.10.9 PagesReadPerSec

Pages read from disk per second to resolve hard page faults.

### 2.10.10 PagesWrittenPerSec

Pages written to disk per second to resolve hard page faults.

### 2.10.11 AvailableSwap

Available swap space in megabytes.

### 2.10.12 PercentAvailableSwap

Available swap space in percent.

### 2.10.13 UsedSwap

Used swap space in megabytes.

### 2.10.14 PercentUsedSwap

Used swap space in percent.

## 2.11 SCX_EthernetPortStatistics

Each instance of this class provides statistical information about an Ethernet port. For example, the following instance provides statistics for the Ethernet interface `eth1`.

```
InstanceID = "eth1"
SampleInterval = "00000000000000.000000:000"
BytesTransmitted = 1634798148
BytesReceived = 2938050399
PacketsTransmitted = 40129891
PacketsReceived = 72116482
Caption = "Ethernet port information"
Description = "Statistics on transfer performance for a port"
BytesTotal = 4572848547
TotalRxErrors = 147
TotalTxErrors = 0
TotalCollisions = 0
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.11.1 Caption

A human-readable caption for this instance.

### 2.11.2 Description

A human-readable description of instance.

### 2.11.3 BytesTotal

The total number of bytes sent or received through the port.

### 2.11.4 TotalRxErrors

The aggregated number of receive errors.

### 2.11.5 TotalTxErrors

The aggregated number of transmit errors.

### 2.11.6 TotalCollisions

The aggregated number of collisions.

## 2.12 SCX_DiskDriveStatisticalInformation

Each instance of this class provides statistical information about a disk drive. For example, consider the following instance.

```
IsAggregate = TRUE
Caption = "Disk drive information"
Description = "Performance statistics related to a physical unit of secondary storage"
Name = "_Total"
IsOnline = TRUE
```

```
BytesPerSecond = 0
ReadBytesPerSecond = 0
WriteBytesPerSecond = 0
TransfersPerSecond = 0
ReadsPerSecond = 0
WritesPerSecond = 0
AverageReadTime = 0.0000000000000000e+00
AverageWriteTime = 0.0000000000000000e+00
AverageTransferTime = 0.0000000000000000e+00
AverageDiskQueueLength = 0.0000000000000000e+00
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.12.1 Caption

A human-readable caption for this instance.

### 2.12.2 Description

A human-readable description of instance.

### 2.12.3 Name

A key property that uniquely identifies this instance.

### 2.12.4 IsOnline

True if this disk is online.

### 2.12.5 PercentBusyTime

Percent of time the disk is busy.

### 2.12.6 PercentIdleTime

Percent of time the disk is idle.

### 2.12.7 BytesPerSecond

Total Disk bytes per second.

### 2.12.8 ReadBytesPerSecond

Bytes read from disk per second.

### 2.12.9 WriteBytesPerSecond

Bytes written to from disk per second.

### 2.12.10 TransfersPerSecond

Total I/Os per second.

### 2.12.11 ReadsPerSecond

Read I/Os per second.

### 2.12.12 WritePerSecond

Write I/Os per second.

### 2.12.13 AverageReadTime

Average time, in seconds, of a read of data from the disk.

### 2.12.14 AverageWriteTime

Average time, in seconds, of a write of data to the disk.

### 2.12.15 AverageTransferTime

Average time, in seconds, of a disk transfer.

### 2.12.16 AverageDiskQueueLength

Average number of queued read/write requests.

## 2.13 SCX_FileSystemStatisticalInformation

Each instance of this class provides statistical information about a file system. The following instance provides statistics for the root files system.

```
IsAggregate = FALSE
Caption = "File system information"
Description = "Performance statistics related to a logical unit of secondary storage"
Name = "/"
IsOnline = TRUE
FreeMegabytes = 6271
UsedMegabytes = 9347
PercentFreeSpace = 40
PercentUsedSpace = 60
PercentFreeInodes = 83
PercentUsedInodes = 17
PercentBusyTime = NULL
PercentIdleTime = NULL
BytesPerSecond = 1583
ReadBytesPerSecond = 0
WriteBytesPerSecond = 1583
TransfersPerSecond = 0
ReadsPerSecond = 0
WritesPerSecond = 0
AverageTransferTime = NULL
AverageDiskQueueLength = NULL
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.13.1 Caption

A human-readable caption for this instance.

### 2.13.2 Description

A human-readable description of instance.

### 2.13.3 Name

A key property that uniquely identifies this instance.

### 2.13.4 IsOnline

True if this file system is online (mounted).

### 2.13.5 FreeMegabytes

Available space in megabytes.

### 2.13.6 UsedMegabytes

Used space in megabytes.

### 2.13.7 PercentFreeSpace

Available space in percent.

### 2.13.8 PercentUsedSpace

Used space in percent.

### 2.13.9 PercentFreeInodes

Available inodes in percent.

### 2.13.10 PercentUsedInodes

Used inodes in percent.

### 2.13.11 PercentBusyTime

Percent of time filesystem is busy.

### 2.13.12 PercentIdleTime

Percent of time filesystem is idle.

### 2.13.13 BytesPerSecond

Total bytes per second.

### 2.13.14 ReadBytesPerSecond

Bytes read per second.

### 2.13.15 WriteBytesPerSecond

Bytes written per second.

### 2.13.16 TransfersPerSecond

Total I/Os per second.

### 2.13.17 ReadsPerSecond

Read I/Os per second.

### 2.13.18 WritesPerSecond

Write I/Os per second.

### 2.13.19 AverageTransferTime

Average time of transfer in seconds.

### 2.13.20 AverageDiskQueueLength

Average number of queued read/write requests.

## 2.14 SCX_UnixProcessStatisticalInformation

Each instance of this class provides statistical information about a Unix process. The following instance provides statistics for the `init` process.

```
CSCreationClassName = "SCX_ComputerSystem"
CSName = "scxcore-suse01.scx.com"
OSCreationClassName = "SCX_OperatingSystem"
OSName = "SuSE Distribution"
Handle = "1"
ProcessCreationClassName = "SCX_UnixProcessStatisticalInformation"
Name = "init"
CPUTime = 0
VirtualText = 499712
VirtualData = 233472
VirtualSharedMemory = 40
CpuTimeDeadChildren = 3170331
SystemTimeDeadChildren = 1418717
Caption = "Unix process information"
Description = "Performance statistics for an individual Unix process"
PercentUserTime = 0
PercentPrivilegedTime = 0
UsedMemory = 64
PercentUsedMemory = 8
PagesReadPerSec = 0
```

The following subsections describe the local properties and methods of this class. See the superclass for a description of inherited features.

### 2.14.1 Caption

A human-readable caption for this instance.

### 2.14.2 Description

A human-readable description of instance.

### 2.14.3 BlockReadsPerSecond

Block reads per second.

### 2.14.4 BlockWritesPerSecond

Block writes per second.

### 2.14.5 BlockTransfersPerSecond

Block transfers per second.

### 2.14.6 PercentUserTime

Percentage of non-idle processor time spent in user mode.

### 2.14.7 PercentPrivilegedTime

Percentage of non-idle processor time spent in privileged mode.

### 2.14.8 UsedMemory

Used physical memory in kilobytes.

### 2.14.9 PercentUsedMemory

Ratio of Resident Set Size to Virtual Memory for process (essentially percentage of process loaded into memory).

### 2.14.10 PagesReadPerSec

Pages read from disk per second to resolve hard page faults.

# 3 Configuration Files

XPlatProviders uses the following two configuration files.

```
{confdir}/scxlog.conf
{confdir}/scxrunas.conf
```

These are discussed in the sections below.

## 3.1 scxlog.conf

This configuration file controls the provider logging facility. By default, all provider logging is directed to `{logdir}/log/scx.log`. The default logging threshold is `'WARNING'`. The `scxlog.conf` file can redirect logging to multiple files and it may control the logging threshold for those files. For example, consider the following file.

```
FILE (
PATH: /opt/xplatproviders/log/log1
MODULE: WARNING
MODULE: scx.core.providers TRACE
)
FILE (
PATH: /opt/xplatproviders/log/log2
```

```
MODULE: WARNING
MODULE: scx.core.common TRACE
)
```

This log has two sections. Each section sends logging output to a specific file. The first section directs log output to `/opt/xplatproviders/log/myfile`. TRACE severity log messages are logged for the logging module called `scx.core.providers`. For the 'root' module (everything else), only WARNING severity log messages are logged. Any section may have multiple module lines.

The logging severities are as follows.

- `ERROR` - The system could not perform the task it was supposed to perform. Contact support.
- `WARNING` - Abnormal behavior that could be handled.
- `INFORMATION` - Information that is useful to someone trying to figure out the general state of the application. Example: Successful initialization.
- `TRACE` - Information that is useful to someone trying to follow general program execution flow.
- `HYSTERICAL` - Information that is useful to someone trying to follow very detailed program execution flow. This level will normally only be used for finding and fixing bugs and in those cases only for small modules. Note that `HYSTERICAL` is not inherited by lower levels for a given logging module.
- `SUPPRESS` - It must be possible to suppress messages using a severity threshold that is higher than any log message can have.

The logging modules are listed here.

```
scx
scx.core
scx.core.common
scx.core.common.pal
scx.core.common.pal.os
scx.core.common.pal.os.filepath
scx.core.common.pal.os.filestream
scx.core.common.pal.system
scx.core.common.pal.system.common
scx.core.common.pal.system.common.entityenumeration
scx.core.common.pal.system.common.entityinstance
scx.core.common.pal.system.cpu.cpuenumeration
scx.core.common.pal.system.cpu.cpuinstance
scx.core.common.util
scx.core.common.util.math
scx.core.common.util.stringaid
scx.core.providers
scx.core.providers.cpu
scx.core.providersupport
scx.core.providersupport.cmpibase
```

These are arranged in a hierarchy, so specifying `scx.core.providers` also affects the following modules (of which `scx.core.providers` is a prefix).

```
scx.core.providers
scx.core.providers.cpu
scx.core.providersupport
scx.core.providersupport.cmpibase
```

## 3.2 scxrunas.conf

This configuration file controls the execution of the following extrinsic methods (described above).

```
SCX_OperatingSystem.ExecuteCommand()
SCX_OperatingSystem.ExecuteShellCommand()
SCX_OperatingSystem.ExecuteScript()
```

The `SCX_OperatingSystem` provider runs in its own agent process. The process owner is the same as the user that initiated the CIM client request. The three methods above spawn a new process to execute the command or script. This configuration file controls three options that affect this new process. The following `scxrunas.conf` file has the default settings (the settings used if the file is empty or missing).

```
AllowRoot=false
ChRootPath=
CWD=/opt/xplatproviders/run
```

The `AllowRoot` option indicates whether the process may execute as root. By default it cannot. The `ChRootPath`, if non-empty, is the path on which a `chroot` system call is performed immediately after creating the process but before executing the command or script. By default `ChRootPath` is empty, indicating that no `chroot` is performed. The `CWD` option is the directory that the process executes in. By default it is the same as the `{rundir}` configured during installation.