

Containers

Chapter 2:

Performance Objectives

You will learn:

- Advantages of using containers.
- Resource pools.
- Different types of zones.
- Current pools.

Solaris Containers

- **Solaris Containers - Sun's operating system virtualization technique - consists of several technologies that work together to foster improved resource management and isolate the environment from the underlying OS.**
- **With Solaris Containers, organizations can determine how to allocate resources among applications and services, and ensure they do not interfere with one another.**

Solaris Zones

- **Applications need to run in isolated environments that make it appear as if they are running on physically separate machines.**
- **This is made possible by a Solaris Container technology called Solaris Zones, which provides separate environments on a machine and logically isolates applications from one another.**
- **Each application receives a dedicated namespace in which to run, and cannot see, monitor, or affect applications running in another zone.**

Dynamic Resource Pools

- In many applications there are two types of applications, one that needs a fully dedicated CPU, and another that is more flexible and can share CPUs.
- In order to accomplish these different levels of isolation, a Solaris Container technology called Dynamic Resource Pools enables CPU resources to be dedicated to specific applications.

Fair Share Scheduler

- While the two web servers are capable of sharing the remaining CPUs on the system, they each need a minimum guarantee of CPU resources that will be available to them.
- This is made possible by another Solaris Container technology called the FSS: Fair Share Scheduler.
- This software enables CPU resources to be allocated proportionally to applications.
- Each application gets assigned a number of the available shares of the total CPU.

Two Types of Zones

- **All systems that run Solaris 10 contain a master zone, called the global zone.**
- **The global zone is the original Solaris OS instance. It has access to the physical hardware and can control all processes.**
- **It also has the authority to create and control new zones, called non-global zones, in which applications run.**
- **Non-global zones do not run inside the global zone - they run along side it - yet the global zone can look inside non-global zones to see how they are configured, monitored, and controlled.**

New Resource Pool: Creating

- **In the Solaris OS, a resource pool is a logical entity that owns a subset of the system resources, like CPU and Memory.**
- **These subsets are known as resource sets. Currently the Solaris OS only has one type of resource set - a processor set.**
- **Every resource pool is associated with a processor set – if it is necessary to provide a pool its own unique CPUs, it will be necessary to define the processor set, the number of processors it contains, and associate it with a pool.**
- **Every additional resource pool created is taken out of the default pool.**
- **Resource pools can be dynamically created and removed on a running system, but there must be one CPU for the default pool.**

New Resource Pool: Creating

- Enable the resource pools feature, using the `pooladm(1M)` command.

```
pooladm -e
```

- This command is run in the global zone.
- Save the current configuration to a file by using the `pooladm` command.

```
global# pooladm -s
```

List Existing Pools

```
system solhost
  string system.comment
  int     system.version 1
  boolean system.bind-default true
  int     system.poold.pid 5753

pool pool_default
  int     pool.sys_id 0
  boolean pool.active true
  boolean pool.default true
  int     pool.importance 1
  string  pool.comment
  pset    pset_default

pset pset_default
  int     pset.sys_id -1
  boolean pset.default true
  uint    pset.min 1
  uint    pset.max 65536
  string  pset.units population
  uint    pset.load 11
  uint    pset.size 1
  string  pset.comment

cpu
  int     cpu.sys_id 0
  string  cpu.comment
  string  cpu.status on-line
```

When starting on a system on which no pools have been configured, there should only be one pool entry, "pool pool_default" .

Create a Processor Set

- **Create a processor set containing one CPU, using the poolcfg command.**

```
global# poolcfg -c 'create pset email-  
pset (uint pset.min=1; uint pset.max=1)'
```

This command changes the pool configuration in order to create a processor set (pset) called email-pset with a minimum of 1 CPU and maximum of 1 CPU.

Create a Resource Pool for the Processor Set

```
poolcfg -c 'create pool email-pool'
```

- Link the pool to the processor set.

```
poolcfg -c 'associate pool email-  
pool (pset email-pset)'
```

- Activate the configuration.

```
pooladm -c
```