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lpar2rrd

- <http://www.lpar2rrd.com/>

VP-to-entitlement ratio

Ideally the ratio should be 2.5 or less. Anything above 4.0 is performance unfriendly, especially on multi-node systems (770 and above).

How to estimate the number of virtual processors per uncapped shared LPAR:

The first step would be to monitor the utilization of each partition and for any partition where the average utilization is ~100%, then add one virtual )processors. (use capacity of the already configured virtual processors before adding more

If the peak utilization is well below 50%, then look at the ratio of virtual processors to configured entitlement and if the ratio is > 1, then consider reducing the ratio. (In any case if there are too many virtual processors configured, AIX can “fold” those processors.)

AIX monitors the utilization of each virtual processor and the utilization of an PLPAR, and if utilization goes below 50%, AIX will start folding down the virtual CPUs so that fewer virtual CPUs will be dispatched. (If utilization goes beyond 50% AIX starts unfolding virtual CPUs.)

Considerations for Virtual Processor (VP) and Entitled Capacity:

- Lpars that require high performance (such as critical database) can be forced to get the best resources by activating the critical LPAR first prior to activating any other LPARs including VIO Server.
- The best practice for LPAR entitlement would be setting entitlement close to average utilization and let the peak addressed by additional uncapped capacity. (exceptions could be LPARs with higher priority)
- For each shared LPAR the number of VPs must be less than (or equal) to the number of cores of the shared pool
- Shared uncapped LPARS with too low VPs will not cover Production Need (VP number is a limit for uncapped LPARs)
- When AIX folding is turned off it can happen that PhysC (physical cores used) is high, but AIX shows high percentage of idle time. (This is because unused Virtual Processors are also assigned to cores, but they are not doing any work at all.)

Checking how many Virtual Processors are active:

```
root@bb_lpar:/ # lparstat -i | grep Virt
Online Virtual CPUs           : 2                <--we have 2 virtual processors configured
Maximum Virtual CPUs         : 8
Minimum Virtual CPUs          : 1
Desired Virtual CPUs          : 2

root@bb_lpar:/ # bindprocessor -q
The available processors are:  0 1 2 3 4 5 6 7                <--this shows smt=4 active (4 threads/virtual processor)

root@bb_lpar:/ # echo vpm | kdb
...
 0  0  ACTIVE  0  AWAKE  0000000000000000 00000000 00
 1  0  ACTIVE  0  AWAKE  0000000000000000 00000000 00
 2  0  ACTIVE  0  AWAKE  0000000000000000 00000000 00
 3  0  ACTIVE  0  AWAKE  0000000000000000 00000000 00
 4  0  DISABLED 0  AWAKE  0000000000000000 00000000 00    <--4 lines are DISABLED, so 1 Virt. proc. is inactive (folding)
 5 11  DISABLED 0  SLEEPING 00000000515B4478 29DBE3CA 02
 6 11  DISABLED 0  SLEEPING 00000000515B4477 2C029174 02
 7 11  DISABLED 0  SLEEPING 00000000515B4477 2C0292A1 02
```

SMT

threads = VP x (SMT threads par processeur) = logical CPUs

Soit la partoche ci-dessous :

```
root@partoche:/root # lparstat -i |grep Virtual
Online Virtual CPUs           : 3
Maximum Virtual CPUs         : 6
Minimum Virtual CPUs          : 1
Desired Virtual CPUs          : 3
```

```
root@partoche:/root # smtctl

This system is SMT capable.
This system supports up to 4 SMT threads per processor.
SMT is currently enabled.
```

SMT boot mode is not set.  
SMT threads are bound to the same virtual processor.

proc0 has 4 SMT threads.  
Bind processor 0 is bound with proc0  
Bind processor 1 is bound with proc0  
Bind processor 2 is bound with proc0  
Bind processor 3 is bound with proc0

proc4 has 4 SMT threads.  
Bind processor 4 is bound with proc4  
Bind processor 5 is bound with proc4  
Bind processor 6 is bound with proc4  
Bind processor 7 is bound with proc4

proc8 has 4 SMT threads.  
Bind processor 8 is bound with proc8  
Bind processor 9 is bound with proc8  
Bind processor 10 is bound with proc8  
Bind processor 11 is bound with proc8

```

Topas Monitor for host:  partoche
Fri Nov 27 15:50:05 2015 Interval: 2

CPU  User%  Kern%  Wait%  Idle%  Physc
0    81.9   16.7   1.2    0.2    0.41
2    0.0    1.0    0.0    99.0   0.08
3    0.0    1.0    0.0    99.0   0.08
4    0.0    43.4   0.0    56.6   0.00
5    0.0    31.7   0.0    68.3   0.00
6    0.0    0.9    0.0    99.1   0.08
11   0.0    0.3    0.0    99.7   0.00
11   0.0    0.0    0.0    100.0  0.01
7    0.0    0.3    0.0    99.7   0.00
8    0.0    74.6   0.0    25.4   0.01
9    0.0    2.3    0.0    97.7   0.01
10   0.0    0.0    0.0    100.0  0.01

Network  KBPS  I-Pack  O-Pack  KB-In  KB-Out
Total    218.6  346.0   329.9   92.1   126.5

Disk      Busy%  KBPS  TPS  KB-Read  KB-Writ
Total     2.4  2126.9  226.0  1640.6  486.4

FileSystem      KBPS  TPS  KB-Read  KB-Writ
Total           2.2K  331.3  1.7K  486.3

Name      PID  CPU%  PgSp  Owner
oracle    9830502  15.1  6.7  orair3
oracle    14483686  13.9  14.0  orair3
oracle    26411184  10.0  10.6  orair3
oracle    6684822  8.6  6.7  orair3
enserver  29425668  1.3  56.3  ir3adm
oracle    16580828  0.6  26.8  ir3adm
oracle    27132004  0.4  8.0  ir3adm
bgscolle  11403318  0.2  3.3  bmcpor
sapstart  16187400  0.2  22.3  ir3adm
init       1  0.1  0.8  root
PatrolAg  8454164  0.0  15.7  patrol
syncd     3211376  0.0  0.6  root
lrud      262152  0.0  0.6  root
gil       1769526  0.0  0.9  root
getty     4194474  0.0  0.6  root
nfssync_  3604592  0.0  0.7  root
random    4587558  0.0  0.4  root
vmmd      458766  0.0  0.8  root
nfsd      4915360  0.0  1.8  root
bdaemon   7471354  0.0  1.8  root

EVENTS/QUEUES  FILE/TTY
Cswitch 1323  Readch 1815.1K
Syscall 4913  Writech 612.6K
Reads 574  Rawin 0
Writes 363  Ttyout 356
Forks 6  Igets 0
Execs 7  Namei 469
Runqueue 1.0  Dirblk 0
Waitqueue 0.0

MEMORY
PAGING  Real,MB 24576
Faults 1554  % Comp 90
Steals 0  % Noncomp 1
PgspIn 0  % Client 1
PgspOut 0
PageIn 0  PAGING SPACE
PageOut 0  Size,MB 25600
Sios 0  % Used 2
% Free 98

NFS (calls/sec)
Serv2 0  WPAR Activ 0
CliV2 0  WPAR Total 0
Serv3 0  Press: "h"-help
CliV3 0  "q"-quit
Serv4 0
CliV4 0

```

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