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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						EVENTS/QUEUES		FILE/TTY	
Fri Nov 27 15:50:05 2015 Interval: 2						Cswitch	1323	Readch	1815.1K
						Syscall	4913	Writech	612.6K
CPU User% Kern% Wait% Idle% Physc						Reads	574	Rawin	0
0	81.9	16.7	1.2	0.2	0.41	Writes	363	Ttyout	356
2	0.0	1.0	0.0	99.0	0.08	Forks	6	Igets	0
3	0.0	1.0	0.0	99.0	0.08	Execs	7	Namei	469
4	0.0	43.4	0.0	56.6	0.00	Runqueue	1.0	Dirblk	0
5	0.0	31.7	0.0	68.3	0.00	Waitqueue	0.0		
1	0.0	0.9	0.0	99.1	0.08	MEMORY			
6	0.0	0.3	0.0	99.7	0.00	PAGING		Real,MB	24576
11	0.0	0.0	0.0	100.0	0.01	Faults	1554	% Comp	90
7	0.0	0.3	0.0	99.7	0.00	Steals	0	% Noncomp	1
8	0.0	74.6	0.0	25.4	0.01	PgspIn	0	% Client	1
9	0.0	2.3	0.0	97.7	0.01	PgspOut	0		
10	0.0	0.0	0.0	100.0	0.01	PageIn	0	PAGING SPACE	
Network KBPS I-Pack O-Pack KB-In KB-Out						PageOut	0	Size,MB	25600
Total	218.6	346.0	329.9	92.1	126.5	Sios	0	% Used	2
						NFS (calls/sec)			
Disk Busy% KBPS TPS KB-Read KB-Writ						Serv2	0	WPAR Activ	0
Total	2.4	2126.9	226.0	1640.6	486.4	CliV2	0	WPAR Total	0
FileSystem KBPS TPS KB-Read KB-Writ						Serv3	0	Press: "h"-help	
Total		2.2K	331.3	1.7K	486.3	CliV3	0	"q"-quit	
						Serv4	0		
Name PID CPU% PgSp Owner						CliV4	0		
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					

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