Vector Intrinsics ("man math" for more info)


```
for i=1,1000
   y(2*i) = sin(x(3*i))
```

Does not SWP!

```
vsin(x,y,1000,3,2)
```

Is transformed into this SWP call at –O3.

Double Precision Vector Intrinsics :

vacos	vasin	vatan
vcos	vsin	vtan
vexp	vlog	

(Single precision: vacosf, vasinf, etc.)

Calling convention in Fortran:

```
i1=1000
i2=3
i3=2
call vsin$(%val(%loc(x(1))),%val(%loc(y(1))),%val(i1),%val(i2),%val(i3))
```


Distribución de datos. MLD's & PM's

Considerar data placement tuning si:

- paralelizacion correcta
- no hay problemas de cache coherency contention
- la escalabilidad es peor de lo esperado

IRIX intenta optimizar

La "topology" del programa
El "page–placement"

IRIX proporciona:

MLDsets en configuración cluster y cube
First–touch, round–robin, y fixed page placements
Dynamic page migration

Data placement tuning consiste en especificar las policies y topologias apropiadas y programar con ellas "in mente".

Distribución de datos. MDL’s & PM’s

45

% ***dplace*** **[–place *placement_file*] [–verbose] [options] program [args]**

Uses a high level placement specification in *placement_file* to:

- **set up *policy modules***
- **create and place *mldsets* of specific topology and *resource affinity***
- **assign *threads* and *mld’s* to nodes**
- **place *address ranges* on nodes**

All without recompilation.

dplace **also provides a *subroutine library interface* to allow modification of the choices and explicitly controlled data migration during the program’s execution.**

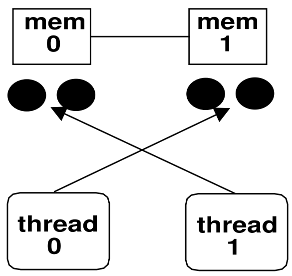
Distribución de datos. MDL’s & PM’s

46

ejemplos

```
dplace
     [-place placement_file]
     [-data_pagesize n-bytes]
     [-stack_pagesize n-bytes]
     [-text_pagesize n-bytes]
     [-migration threshold]
     [-propagate]
     [-mustrun]
     [-v[erbose]]
     program
[program-arguments]
```

```
# placement file
memories 2 in topology cube
threads 2
run thread 0 on memory 1
run thread 1 on memory 0
```




```
memories ($MP_SET_NUMTHREADS+1)/2 in \
                    topology cube
threads $MP_SET_NUMTHREADS
distribute threads across memories block 2
```

```
memories 6 in topology cluster/cube near /dev/graphics
```

Variable page sizes

47

- IRIX supports the following page sizes on Origin:

  16K, 64K, 256K, 1M, 4M, 16M

- Mixable; Each address *range* can have an associated page size, defined in the region's policy module (PM)
- They are set through `dplace` or `pm_setpagesize` to change it for a given PM
- In general the *new dplace command* gives you easy access to the OS internals just described
- The kernel attempts to coalesce free memory to have a certain (tunable) fraction at a given size

Page Migration/Replication

48

- Los HUB tienen un apartado llamado BTE (Block Transfer Engine) que permite copiar páginas a gran velocidad.
- Page migration–replication utiliza este BTE
- by default desabilitado por parametro de sistema
- Actibable global, con un PM o a través de un API