

### Spock Tips & Information

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### Where to Find Helpful Environment Variables

#### man pages for srun, salloc, sbatch

- Input and output environment variables can be found at bottom of each page
- E.g., SLURM\_JOB\_ID, SLURM\_LOCALID, SLURM\_JOB\_NODELIST

#### man intro\_mpi

- MPI environment variables
- E.g,. MPICH\_GPU\_SUPPORT\_ENABLED, MPICH\_GPU\_IPC\_THRESHOLD

#### module show <package\_name>

• Shows how loading a package will change your environment





### Where to Find Helpful Environment Variables

<pre>\$ man intro_ intro acm intrin</pre>	intro chlac	intro directives	intro intrin	intro lanacko	intro openmo
intro pmi	intro_colas	incho_directives	IIIII0_IIIIII	псто_тараске	There opening
intro_blacs	intro_coarray	intro_dsmml	<pre>intro_intrinsics</pre>	intro_libm	intro_papi
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intro_blas1	intro_conversion	intro_++10	intro_io	intro_libsci	intro_PAPI
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intro_blas3 intro_quad_precision	intro_craype-api	intro_ieee	<pre>intro_lapack</pre>	intro_openacc	intro_pgas



### Helpful Tools

Users might find the following tools helpful...

#### rocm-smi

- AMD ROCm System Management Interface
- Find useful information about AMD GPUs (e.g., running processes, memory usage, temperature, driver version)
- rocm-smi --help

#### rocminfo

- ROCm Application for Reporting System Info
- Find useful system information (CPUs and GPUs)
- rocminfo --help

#### https://code.ornl.gov/olcf/hello\_mpi\_omp

• MPI + OpenMP Hello World-type program for process and thread placement

#### https://code.ornl.gov/olcf/hello\_jobstep

• MPI + OpenMP + HIP Hello World-type program for process, thread, and GPU mapping



## Debugging Issues on a Compute Node

Terminal 1

You can ssh to compute nodes that are allocated to your job.

squeue (or other ways) will show the list of compute nodes for a job.

#### ssh <spock\_node\_id>

From there you can start troubleshooting. E.g., using **rocm-smi** to look at memory usage, processes on the GPUs, or **gstack** <**pid**> for CPU processes.

\$ salloc -A stf016 -t 30 -N 1	
salloc: Pending job allocation 261090	
salloc: job 261090 queued and waiting for resources	
salloc: job 261090 has been allocated resources	
salloc: Granted job allocation 261090	
salloc: Waiting for resource configuration	
salloc: Nodes spock13 are ready for job	

	<pre>\$ ssh spock1</pre>	.3				
	\$ hostname spock13					
	\$ rocm-smi - ====================================	-showpids	ROCm System Ma ====== KFD P	nagement Inte Processes ====	rface =======	
	KFD process	information:				
	PID	PROCESS NAM	E GPU(s)	VRAM USED	SDMA USED	CU OCCUPANCY
	70605	p2p	2	2155888640	0	0
	70604	p2p	2	2155888640	0	0
al		=======================================	===== End of R	OCm SMI Log =		
Termin	<pre>\$ rocm-smi - GPU[0] GPU[1] GPU[2] GPU[3] ====================================</pre>	-showmemuse	ROCm System Ma ====== Current : GPU memory : GPU memory : GPU memory : GPU memory ===== End of R	nagement Inte Memory Use = use (%): 5 use (%): 0 use (%): 0 use (%): 5 OCm SMI Log =	rface ======= ==========	
	\$ gstack <pi< th=""><th>D&gt;</th><th></th><th></th><th></th><th></th></pi<>	D>				



## Custom Slurm Commands

You can customize the output of e.g,. squeue, sinfo, sacct to your preference.

\$ squeue -o "%7A   %10P   %10u   %10a   %20j   %111   %9M   %6D   %3t   %8Q   %30R"							
JOBIDPARTITIONUSERACCOUNT261090batchtpapathestf016	NAME   interactive	TIME_LIMIT   1:00:00	TIME   27:42	NODES	ST   R	PRIORITY 2300	NODELIST(REASON) spock13

\$ sacct	-format=User,	JobID,Jobnam	e,partition	,state,time	,start,ela	psed,nnodes,ncpus,node	elist,Prior	ity -j 2610	90		
User	JobID	JobName	Partition	State	Timelimit	Start	Elapsed	NNodes	NCPUS	NodeList	Priority
tpapathe	261090	interacti+	batch	RUNNING	01:00:00	2021-05-19T17:25:27	00:35:02	1	128	spock13	20
	261090.inte+	interacti+		RUNNING		2021-05-19T17:25:27	00:35:02	1	64	spock13	
	261090.exte+	extern		RUNNING		2021-05-19T17:25:27	00:35:02	1	128	spock13	
	261090.0	p2p		COMPLETED		2021-05-19T17:31:54	00:00:53	1	64	spock13	
	261090.1	p2p		COMPLETED		2021-05-19T17:32:56	00:00:52	1	64	spock13	
	261090.2	p2p		COMPLETED		2021-05-19T17:33:56	00:00:52	1	64	spock13	

\$ sinfofo	sinfoformat="%10P   %6a   %6D   %10T   %9s   %30N" -p caar						
PARTITION	AVAIL	NODES	STATE	JOB_SIZE	NODELIST		
caar	up	5	allocated	1-16	spock[01-02,13,25-26]		
caar	l up	31	idle	1-16	spock[03-12,14-24,27-36]		



### Capture Job Information



### Show Information About Completed Jobs

Specify a start (-S) and end (-E) time to search for completed jobs.

• The default time window depends on other options (see man sacct)

\$ sacc	tuser	r=tpapathe	-S 2021-05-1	8T23:00 -E	2021-05-18	T23:45	
	JobID	JobName	Partition	Account	AllocCPUS	State	ExitCode
259409		scontrol	batch	stf016	128	COMPLETED	0:0
259409	.exte+	extern		stf016	128	COMPLETED	0:0
259409	.0	scontrol		stf016	64	COMPLETED	0:0
259426		test	batch	stf016	128	COMPLETED	0:0
259426	.batch	batch		stf016	64	COMPLETED	0:0
259426	.exte+	extern		stf016	128	COMPLETED	0:0
259426	.0	hostname		stf016	64	COMPLETED	0:0



## Cray and HIP Compiler Wrappers Remo

\$ CC -craype-verbose test.cpp

clang++ -march=znver2 -dynamic -D\_\_CRAY\_X86\_ROME -D\_\_CRAYXT\_COMPUTE\_LINUX\_TARGET --gcc-toolchain=/opt/gcc/8.1.0/snos -isystem /opt/cray/pe/cce/11.0.4/cceclang/x86\_64/lib/clang/11.0.0/include -isystem /opt/cray/pe/cce/11.0.4/cce/x86\_64/include/craylibs -Wl,-rpath=/opt/cray/pe/cce/11.0.4/cce/x86\_64/lib -Wl,rpath=/opt/cray/pe/gcc-libs tests.cpp -I/opt/cray/pe/libsci/21.04.1.1/CRAY/9.0/x86\_64/include -I/opt/cray/pe/mpich/8.1.4/ofi/cray/9.1/include -I/opt/cray/pe/pmi/6.0.10/include -I/opt/cray/pe/dsmml/0.1.4/dsmml//include -I/opt/cray/xpmem/2.2.40-2.1\_2.7\_g3cf3325.shasta/include -L/opt/cray/pe/libsci/21.04.1.1/CRAY/9.0/x86\_64/lib -L/opt/cray/pe/mpich/8.1.4/ofi/cray/9.1/lib -L/opt/cray/pe/pmi/6.0.10/lib -L/opt/cray/pe/dsmml/0.1.4/dsmml//lib -L/opt/cray/pe/cce/11.0.4/cce/x86\_64/lib/pkgconfig/../ -L/opt/cray/pe/pmi/6.0.10/lib -L/opt/cray/pe/dsmml/0.1.4/dsmml//lib -L/opt/cray/pe/cce/11.0.4/cce/x86\_64/lib/pkgconfig/../ -L/opt/cray/xpmem/2.2.40-2.1\_2.7\_g3cf3325.shasta/lib64 -lpmi -Wl,-as-needed,-lsci\_cray\_mpi,--no-as-needed,-lsci\_cray,--no-as-needed -ldl -Wl,--as-needed,-lmpi\_cray,--no-as-needed,ldsmml,--no-as-needed -Wl,--as-needed,-lpgas-shmem,--no-as-needed -lquadmath -lmodules -lfi -lcraymath -lf -lu -lcsup -Wl,--as-needed,-latomic,--no-asneeded -Wl,--as-needed,-lm,--no-as-needed clang-11: error: no such file or directory: 'test.cpp'

\$ export HIPCC VERBOSE=3 HIPCC VERBOSE=<value>, where value can be 1-7 \$ hipcc test.cpp HIP PATH=/sw/spock/spack-envs/views/rocm-4.1.0/hip HIP PLATFORM=amd HIP COMPILER=clang HIP RUNTIME=rocclr ROCM PATH=/sw/spock/spack-envs/views/rocm-4.1.0 HIP ROCCLR HOME=/sw/spock/spack-envs/views/rocm-4.1.0/hip HIP CLANG PATH=/sw/spock/spack-envs/views/rocm-4.1.0/llvm/bin HIP CLANG INCLUDE PATH=/autofs/nccs-svm1 sw/spock/spack-envs/views/rocm-4.1.0/llvm/lib/clang/12.0.0/include HIP INCLUDE PATH=/sw/spock/spack-envs/views/rocm-4.1.0/hip/include HIP LIB PATH=/sw/spock/spack-envs/views/rocm-4.1.0/hip/lib DEVICE LIB PATH=/sw/spock/spack-envs/views/rocm-4.1.0/amdgcn/bitcode hipcc-cmd: /sw/spock/spack-envs/views/rocm-4.1.0/llvm/bin/clang++ -D HIP ROCclr -std=c++11 -isystem /autofs/nccs-svm1 sw/spock/spack-envs/views/rocm-4.1.0/llvm/lib/clang/12.0.0/include/.. -isystem /sw/spock/spack-envs/views/rocm-4.1.0/include -D HIP ROCclr -isystem /sw/spock/spack-envs/views/rocm-4.1.0/hip/include --offload-arch=gfx908 -03 -mllvm -amdgpu-early-inline-all=true -mllvm -amdgpu-function-calls=false -fhip-new-launch-api --rocmpath=/sw/spock/spack-envs/views/rocm-4.1.0 -L/sw/spock/spack-envs/views/rocm-4.1.0/hip/lib -03 -lgcc s -lgcc -lpthread -lm -x hip test.cpp -Wl,--enable-newdtags -Wl,--rpath=/sw/spock/spack-envs/views/rocm-4.1.0/hip/lib:/sw/spock/spack-envs/views/rocm-4.1.0/lib -lamdhip64 -L/sw/spock/spack-envs/views/rocm-4.1.0/llvm/bin/../lib/clang/12.0.0/lib/linux -lclang rt.builtins-x86 64 clang-12: error: no such file or directory: 'test.cpp'

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## Linking in HSA Library

ld.lld: error: /opt/cray/pe/mpich/8.1.4/gtl/lib/libmpi\_gtl\_hsa.so: undefined reference to hsa\_amd\_memory\_pool\_allocate [--no-allow-shlib-undefined] ld.lld: error: /opt/cray/pe/mpich/8.1.4/gtl/lib/libmpi\_gtl\_hsa.so: undefined reference to hsa\_amd\_agent\_iterate\_memory\_pools [--no-allow-shlib-undefined] ld.lld: error: /opt/cray/pe/mpich/8.1.4/gtl/lib/libmpi\_gtl\_hsa.so: undefined reference to hsa\_iterate\_agents [--no-allow-shlib-undefined]

Users might need to manually link in **libhsa-runtime64.so** in some codes.

- E.g., When setting PE\_MPICH\_GTL\_DIR\_amd\_gfx908 and PE\_MPICH\_GTL\_LIBS\_amd\_gfx908 to use GPU-Aware MPI.
- If needed, you can link in this library using: **\$ROCM\_PATH**/lib -lhsa-runtime64

#### You can learn more about HSA here:

- <u>https://rocmdocs.amd.com/en/latest/Installation\_Guide/ROCR-Runtime.html</u>
- <u>https://rocmdocs.amd.com/en/latest/ROCm\_Glossary/ROCm-Glossary.html</u>



# Keeping Up with the Clangs

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There are multiple version of Clang compilers on Spock. If you're uncertain of which version is being used in your environment, you can issue which clang++ to find out.

<pre>\$ module -t list </pre>	It is highly recommended to use the Cray compiler wrappers ( cc , CC , and ftn ) whenever possible. See the next section for more details.									
<pre>cce/11.0.4 craype/2.7.6 craype-x86-rome libfabric/1.11.0.3.74 craype-network-ofi cray-dsmml/0.1.4 perftools-base/21.02.0 xpmem/2.2.40-2.1_2.7_g3cf3325.shasta cray-mpich/8.1.4 cray-libsci/21.04.1.1 cray-pmi/6.0.10 cray-pmi-lib/6.0.10 DefApps/default</pre>	Vendor	Programming Env	vironment	Compiler Module	Language	Compiler Wrapper	Compiler			
	Cray	PrgEnv-cray		cce	C C++	cc CC	craycc craycxx Or crayCC			
	AMD	Not yet available		rocm	C C++ Fortran	Not yet available Not yet available Not yet available	<pre>\$ROCM_PATH/llvm/bin/clang \$ROCM_PATH/llvm/bin/clang++ \$ROCM_PATH/llvm/bin/flang</pre>			
<pre>rocm/4.1.0 \$ which clang++ /sw/spock/spack-envs/views/rocm-4.1.0/1 \$ module unload rocm</pre>	DefApps/default PrgEnv-cray/8.0.0 rocm/4.1.0 \$ which clang++ /sw/spock/spack-envs/views/rocm-4.1.0/llvm/bin/cla \$ module unload rocm			NOTE: It is highly recommended to use the Cray compiler wrappers whenever possible, but if for some reason the wrappers cannot be used, the craycc, crayCC, and crayftn compilers should be used instead of directly using Cray's Clang compilers.						
<pre>\$ which clang++ /opt/cray/pe/cce/11.0.4/cce-clang/x86_64/bin/clang++</pre>			<ul> <li>For ROCm Clang compilers, give full path</li> <li>For Cray Clang compilers, use compiler wrappers or craycc, crayCC, crayftn</li> </ul>							

### Generate Detailed Node Image

From within an interactive job (or via batch script)...

- \$ salloc -A stf016 -t 30 -N 1 salloc: Pending job allocation 258383 salloc: job 258383 queued and waiting for resources salloc: job 258383 has been allocated resources salloc: Granted job allocation 258383 salloc: Waiting for resource configuration salloc: Nodes spock27 are ready for job
- \$ module load hwloc
- \$ srun -n1 lstopo spock\_compute\_node.svg

scp to your laptop/desktop and open in browser or convert
to png using e.g., inkscape

I don't expect you to be able to read this in the slide : )

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| Groupθ   
   
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   |   |  | Group0  |  
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| Group0<br>NUMANode L#2 P#2 (63G8)  
   
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   |   |  | Group0<br>NUMANode L#3  | P#3 (63GB)   
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  |
| Group0<br>NUTANOGE L#2 P#2 (63GB)<br>L3 (16HB)   
   
  | L3 (16MB)  
   
   
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  |  | L3 (16MB)  |  
   |   |  | Group0<br>NUMANode L#3<br>L3 (16MB)   | I P#3 (63GB)   
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   | L3 (16MB)  |  |   |   
  |
| Group0<br>NUMMode L#2 7#2 (6368)<br>[3 (1698)<br>[2 (512K8) [12 (512K8) [12 (512K8)]<br>[12 (512K8) [12 (512K8)]   
   
  | L3 (16MB)<br>L2 (512KB) L2 (512K   
   
   
  | B) L2 (512KB)  
   
   
  | L2 (512KB)   | L3 (16MB)<br>L2 (512KB)  | L2 (512KB)   
   | L2 (512KB)  | .2 (512KB)   | Group0<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)   | I P#3 (63GB)   
   | L2 (512KB)  | L2 (512KB)  
   | L3 (16MB)<br>L2 (512KB)  | L2 (512KB)   | L2 (512KB)  | L2 (512KB)  
  |
| Croup@           NUNNAGE LE2 7#2 (6368)           L3 (1698)           L2 (51288)           L2 (51288)           L4 (3288)           L16 (3288)           L16 (3288)           L16 (3288)           L16 (3288)  
   
  | L3 (16MB)<br>L2 (512KB) L2 (512K<br>L1d (32KB) L1d (32K  
   
   
  | B) L2 (512KB)<br>B) L1d (32KB)   
   
   
  | L2 (512KB)<br>L1d (32KB)   | L3 (16MB)<br>L2 (512KB) [<br>L1d (32KB) ]  | L2 (512KB)   
   | L2 (512KB)  | .2 (512KB)<br>.1d (32KB)   | Group0<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)   | L2 (512KB)   
   | L2 (512KB)<br>L1d (32KB)  | L2 (512KB)<br>L1d (32KB)  
   | L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)  | L2 (512KB)<br>L1d (32KB)   | L2 (512KB)<br>L1d (32KB)  | L2 (512KB)<br>L1d (32KB)  
  |
| Couple           NUMMAGE         L12           L2         (51268)           L2         (51268)           L4         (2260)           L16         (2260)           L16         (2260)           L16         (2260)           L16         (2260)           L16         (2260)           L11         (2260)   
   
  | L3 (1648)<br>L2 (512K8) L2 (512K<br>L1d (32K8) L1d (32K<br>L11 (32K8) L11 (32K   
   
   
  | 8) L2 (512KB)<br>8) L1d (32KB)<br>8) L11 (32KB)  
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)   | L3 (16M8)<br>L2 (512K8) [<br>L1d (32K8) [<br>L11 (32K8) ]  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)   
   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  | .2 (512K8)<br>.1d (32K8)<br>.11 (32K8)   | Group0<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)   | L2 (512KB)<br>L1 (32KB)<br>L11 (32KB)  
   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  
   | L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)  
  |
| Group8<br>NIMMAGE L82 P82 (6368)<br>13 (1088)<br>12 (51268) 12 (51268) 12 (51268)<br>14 (1269) 14 (1269) 14 (1269)<br>15 (1269) 14 (1269) 14 (1269)<br>15 (1269) 15 (1269) 15 (1269) 15 (1268)<br>15 (1269) 15 (1269) 15 (1268) 15 (1268)<br>15 (1269) 15 (1269) 15 (1268) 15 (1268)   
   
  | L3         (16490)           L2         (512K8)         L2         (512K           L1d         (32K8)         L1d         (32K           L11         (32K8)         L11         (32K           Core         L35         Core         L43   
   
   
  | <ul> <li>B) L2 (512KB)</li> <li>B) L1d (32KB)</li> <li>B) L11 (32KB)</li> <li>7 Core L#38</li> </ul>   
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#39  | L3 (16M8)           L2 (512K8)           L1d (32K8)           L11 (32K8)           Core L#40   | L2 (512KB) [<br>L1d (32KB) [<br>L11 (32KB) [<br>Core L#41 ]  
   | L2 (512KB) [<br>L1d (32KB) [<br>L11 (32KB) [<br>Core L#42 ]   | .2 (512KB)<br>.1d (32KB)<br>.11 (32KB)<br>.core L#43   | Group0<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#48  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#49  
   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#50   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#51   
   | L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#52   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#53  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#54   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#55   
  |
| Group8<br>NHMMode L#2 P#2 (6368)<br>1. (1098)<br>(2. (51269) (2. (51269) (2. (51269))<br>(1. (2009) (1. (2009)) (1. (2009))<br>(1. (2009) (1. (2009)) (1. (2009)) (1. (2009))<br>(1. (2009) (1. (2009)) (1. (2009)) (1. (2009))<br>(1. (2009) (1. (2009)   
   
  | 13         (1646)           12         (51288)         12         (512           11d         (2285)         1.16         (228           1.11         (2285)         1.11         (228           1.11         (2285)         1.11         (228           1.11         (2285)         1.11         (228           9.14         2.15         (219)         (219)           9.15         1.11         (228)         (219)           9.16         1.11         (228)         (219)           9.17         1.11         (228)         (219)           9.18         1.11         (228)         (219)           9.18         1.11         (228)         (219)           9.18         1.11         (228)         (219)           9.14         1.11         (228)         (219)           9.14         1.11         (228)         (219)           9.15         1.11         (228)         (219)           9.15         1.11         (228)         (219)           9.15         1.11         (228)         (219)           9.15         1.11         (228)         (219)  
   
   
  | <ul> <li>B) L2 (512KB)</li> <li>B) L1d (32KB)</li> <li>B) L11 (32KB)</li> <li>T (500 L#38)</li> <li>PU L#76</li> <li>PU L#76</li> </ul>  
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#39<br>PU L#78<br>P20  | L3 (16M8)<br>L2 (512X8) [<br>L1d (32X8) [<br>L11 (32X8) [<br>Core L#40 [<br>PU L830 ]<br>Page 10   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#41<br>PU L#62<br>P#41   
   | L2 (512KB) [<br>L1d (32KB) ]<br>L11 (32KB) [<br>L11 (32KB) ]<br>Core L#42<br>PVL L#64<br>Pv43   | .2 (512KB)<br>.1d (32KB)<br>.11 (32KB)<br>.11 (32KB)<br>   | Croup0<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#48<br>PU L#96<br>Prefe  | P#3 (6368)<br>L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#49<br>PU L#98<br>P#40   
   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#50<br>PU L#50<br>Pu pro  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#51<br>PU L#162<br>perci  
   | L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#52<br>PU L#304<br>Perts  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#53<br>PU L#196<br>p#rs  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#54<br>PU L#108<br>peria  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#55<br>PU L#110<br>perfer   
  |
| Group8           NUMMode L#2 P#2 (6368)           L3 (1048)           L2 (51246)         L2 (51248)           L3 (1048)           L4 (3268)         L1 (3268)           L1 (3268)         L1 (3268)           FU (456         FU (456           FU (454         FU (456)           FU (454)         FU (456)           FU (454)         FU (456)           FU (454)         FU (456)           FU (456)         FU (456)   
   
  | 13         (1698)           12         (51208)         L2         (512           11d         (3208)         L1d         (3208)           L1d         (3208)         L1d         (3208)           L11         (3208)         L11         (3208)           P0         L87         P0         L97           P3         00         P0         L97           P0         L97         P0         L97  
   
   
  | <ul> <li>B) L2 (51268)</li> <li>B) L4 (3268)</li> <li>B) L14 (3268)</li> <li>B) L11 (3288)</li> <li>F) L978</li> <li>F9 L976</li> <li>F9 L977</li> </ul>   
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#39<br>PU L#76<br>P#39<br>PU L#77  | L3 (16H8)<br>L2 (512X8) [<br>L1d (32X8) [<br>L11 (32X8) [<br>Core L#40 [<br>P#40 [<br>P#40 ]<br>P#40 [<br>P#40 ]   | L2 (512KB) [<br>L1d (32KB) [<br>L11 (32KB) [<br>Core L#41<br>PU L#82<br>P#41<br>PU L#83  
   | L2 (512K8) [<br>L1d (32K8) [<br>L11 (32K8) [<br>L11 (32K8) [<br>Core L#42<br>PU L#84<br>P#42<br>PU L#85   | .2 (512KB)<br>.1d (32KB)<br>.11 (32KB)<br>.11 (32KB)<br>.0re L#43<br>PU L#67<br>PU L#67  | Group0           NUMANode L#3           L3 (16M8)           L2 (512K8)           L1d (32K8)           L11 (32K8)           Core L#48           PU L#96           P#48           PU L#97   | L2 (512KB)<br>L1 (32KB)<br>L11 (32KB)<br>Core L#49<br>PU L#99<br>PU L#99<br>PU L#99  
   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#50<br>PU L#100<br>PU L#101   | L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>Core L#51<br>PU L#182<br>P#51<br>PU L#183   
   | L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#52<br>PU L#104<br>P#52<br>PU L#105   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#53<br>PU L#106<br>P#53<br>PU L#107  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#54<br>PU L#108<br>PU L#109   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#55<br>PU L#110<br>P#55<br>PU L#111   
  |
| Group8           NUMMode L#2 F#2 (6368)           L3 (1095)           L2 (51268)         L2 (51268)           L4 (3208)         L2 (51268)           L1d (3208)         L1d (3208)           L1d (3208)         L1d (3208)           L11 (3208)         L1d (3208)           L11 (3208)         L11 (3208)           L11 (3208)         L11 (3208)           PU L#66         Pe13           PU L#66         Pe14           PU L#66         Pe15           PU L#66         Pe15           PU L#66         Pe37           Pu L#60         Pu L#70           Pu L#60         Pe397  
   
  | 13         (1640)           12         (51200)         12         (512           11d         (3200)         1.d         (320           111         (3200)         1.d         (320           111         (3200)         1.d         (320           0         Gore         1.03         1.11         (320           0         Gore         1.03         1.11         (320           11         1.2300)         1.11         (320         1.11         (320           12         9.0         1.87         1.90         1.97         1.91           12         9.0         1.87         1.90         1.97         1.91           12         9.0         1.97         1.91         1.91         1.91         1.91           13         9.0         1.97         1.91 </td <td><ul> <li>B) L2 (51286)</li> <li>B) L1 (3286)</li> <li>B) L1 (3286)</li> <li>Core #88</li> <li>PU L#76<br/>P#18</li> <li>PU L#77<br/>P#102</li> </ul></td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#39<br/>PU L#78<br/>P435<br/>PU L#79<br/>P#103</td> <td>L3 (1698)<br/>L2 (512X8) [<br/>L1d (32X8) [<br/>L11 (32X8) [<br/>Core L840<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480<br/>Pg.480</td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#41<br/>PU L#82<br/>P#41<br/>PU L#83<br/>P#105</td> <td>L2 (512KB) [<br/>L1d (32KB) [<br/>L11 (32KB) [<br/>Core L#22<br/>PU L#84<br/>P#22<br/>PU L#85<br/>P#106</td> <td>.2 (512KB)<br/>.1d (32KB)<br/>.11 (32KB)<br/>.11 (32KB)<br/>.0re L#33<br/>PU L#36<br/>P#43<br/>PU L#87<br/>P#107</td> <td>Group8<br/>NUMANode L#3<br/>L3 (16MB)<br/>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#48<br/>PU L#96<br/>P#48<br/>PU L#97<br/>P#112</td> <td>L2 (512KB)<br/>L1 (32KB)<br/>L11 (32KB)<br/>Core L#49<br/>PU L#99<br/>P#113</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L#50<br/>PU L#100<br/>P50<br/>PU L#101<br/>P#114</td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#51<br/>PU L#102<br/>P#51<br/>PU L#103<br/>P#115</td> <td>L3 (16M8)<br/>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#52<br/>PU L#104<br/>P#52<br/>PU L#105<br/>P#116</td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#53<br/>PU L#107<br/>P#117</td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#54<br/>PU L#108<br/>P54<br/>PU L#109<br/>P#118</td> <td>L2 (512KB)<br/>L1d (32KB)<br/>L11 (32KB)<br/>Core L#55<br/>PU L#110<br/>P#55<br/>PU L#111<br/>P#119</td>  
   
   
  | <ul> <li>B) L2 (51286)</li> <li>B) L1 (3286)</li> <li>B) L1 (3286)</li> <li>Core #88</li> <li>PU L#76<br/>P#18</li> <li>PU L#77<br/>P#102</li> </ul>   
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#39<br>PU L#78<br>P435<br>PU L#79<br>P#103   | L3 (1698)<br>L2 (512X8) [<br>L1d (32X8) [<br>L11 (32X8) [<br>Core L840<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480<br>Pg.480 | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#41<br>PU L#82<br>P#41<br>PU L#83<br>P#105   
   | L2 (512KB) [<br>L1d (32KB) [<br>L11 (32KB) [<br>Core L#22<br>PU L#84<br>P#22<br>PU L#85<br>P#106  | .2 (512KB)<br>.1d (32KB)<br>.11 (32KB)<br>.11 (32KB)<br>.0re L#33<br>PU L#36<br>P#43<br>PU L#87<br>P#107   | Group8<br>NUMANode L#3<br>L3 (16MB)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#48<br>PU L#96<br>P#48<br>PU L#97<br>P#112   | L2 (512KB)<br>L1 (32KB)<br>L11 (32KB)<br>Core L#49<br>PU L#99<br>P#113   
   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#50<br>PU L#100<br>P50<br>PU L#101<br>P#114   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#51<br>PU L#102<br>P#51<br>PU L#103<br>P#115  
   | L3 (16M8)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#52<br>PU L#104<br>P#52<br>PU L#105<br>P#116  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#53<br>PU L#107<br>P#117   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#54<br>PU L#108<br>P54<br>PU L#109<br>P#118   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#55<br>PU L#110<br>P#55<br>PU L#111<br>P#119  
  |
| Group8 SIMMode L#2 F#2 (6368) L3 (1695) L2 (5126) L2 (5126) L2 (5128) L4 (3260) L4 (3260) L14 (3280) L14 (3260) L14 (3280) L14 (3280   
   
  | L3 (1698)<br>L2 (51288) L2 (5128<br>L1d (3288) L1d (328<br>L1d (3288) L1d (328<br>L1d (3288) L1d (328<br>L1d (3288) L1d (328<br>P (47)<br>P  
   
   
  | 8) L2 (512K6)<br>8) L1 (32K6)<br>8) L1 (32K6)<br>11 (32K6)<br>11 (32K6)<br>10 (477)<br>Pu L477<br>Pu 1077<br>Pu 1077   
   
  | L2 (51288)<br>L1d (32K8)<br>L11 (32K8)<br>Core (839<br>PU L878<br>P313<br>PU L879<br>P103<br>P103<br>P103<br>P103<br>P103<br>P103<br>P103<br>P103  | L3 (1648)<br>L2 (512X8) [<br>L1d (32X8) [<br>L11 (32X8) [<br>Core L#40<br>P#104<br>PU L#81<br>P#104   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#41<br>PU L#82<br>P#41<br>PU L#83<br>P#105   | L2 (512K8) [<br>L1d (32K8) [<br>L11 (32K8) [<br>Core L#42  <br>PU L#84  <br>P422  <br>PU L#85  <br>P#106  | .2 (512KB)<br>.1d (32KB)<br>.11 (32KB)<br>.11 (32KB)<br>PU L#86<br>P443<br>PU L#87<br>P410<br>P410<br>P410<br>P410<br>P410<br>P410<br>P410<br>P410   | Group0<br>NUMANOde L#3<br>13 (16%)<br>12
(512K8)<br>11d (32K8)<br>11d (32K8)<br>Core L#48<br>Pu L#37<br>P#112<br>13 (16%)   | P#3 (63G8)           L2 (512K8)           L1d (32K8)           L11 (32K8)           Core (849)           PU (898)           P44 (979)           P91 (899)           P91 (899)           P91 (899)           P91 (899)           P91 (899)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#50<br>PU L#100<br>P#50<br>PU L#101<br>P#114  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L851<br>Pu L8102<br>P8115   
  | L3 (16M8)<br>L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#52<br>PU L#104<br>P#52<br>PU L#105<br>P#116<br>L3 (16M8)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#53<br>PU L#106<br>P#53<br>PU L#107<br>P#117  
  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#54<br>P0 L#108<br>P54<br>P0 L#109<br>P#118   | L2 (512K8)<br>L1d (32K8)<br>Core L855<br>PU L8110<br>P815<br>PU L8111<br>P8119   |
| Group8           WNMMORE L82 PR2 (6368)           L3 (16/95)           L2 (51268)         L2 (51268)           L2 (51268)         L2 (51268)           L16 (3268)         L16 (3268)           L17 (3268)         L16 (3268)           L18 (3268)         L17 (3268)           L11 (3268)         L11 (3268)           Core L82         Pu (465)           Pu (465)         Pu (466)           Pu (466)         Pu (466)           Pu (466)         Pu (466)           Pu (466)         Pu (466)           Pu (466)         Pu (466)           L2 (51260)         L2 (51260)         L2 (51260)  
   
  | L3 (1640)<br>L2 (512K8) L2 (512K<br>L1d (32K8) L1d (32K<br>L1d (32K8) L1d (32K<br>L11 (32K8) L11 (32K<br>PU L872<br>PU L872<br>PU L877<br>PU L877<br>PU L97<br>PU  
   
   
  | <ul> <li>b) [12 (512K6)]</li> <li>b) [1d (32K6)]</li> <li>b) [11 (32K6)]</li> <li>core (#38)</li> <li>p(1476)</li> <li>p(1476)</li> <li>p(1477)</li> <li>p(1477)</li> <li>ore</li> </ul>   
   
   
  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#39<br>PU (#78<br>P239<br>PU (#79<br>P2103   | L3 (1648)         L2 (512K8)         L1d (32K8)         L11 (32K8)         Core L#40         PU L#80         P440         P4104  | L2 (512K8) [<br>L1d (32K8) [<br>L11 (32K8) [<br>Core L#41<br>PU L#83<br>P#105  | L2 (512X8) [<br>L1d (32X8) ]<br>L11 (32X8) [<br>Core L#42 ]<br>P422<br>P423<br>P4106 ]  
   | 2 (512%)<br>.1d (32%)<br>.11 (32 | CroupD<br>NUMANOde L#2<br>L3 (1648)<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#48<br>PU L#57<br>P#112<br>L3 (1648)<br>L2 (512K8)   | L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L11 (32K8)<br>L11 (32K8)<br>Core L#49<br>P413<br>P419<br>P4113<br>L2 (512K8)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#500<br>P#50<br>P#1(#100<br>P#114<br>P#114<br>L2 (512K8)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>L11 (32K8)<br>Core L#51<br>PU510<br>PU5102<br>PU5102<br>PU5103<br>PU5103<br>PU5103<br>L2 (512K8)  
   | L3 (164%)<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#52<br>P40 (#104<br>P452<br>P40 (#104<br>P4116<br>L3 (164%)<br>L2 (512K8)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>L11 (32K8)<br>Core L#53<br>PU L#106<br>P#513<br>PU L#107<br>P#117<br>L2 (512K8)  
   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#54<br>Pd54<br>Pd54<br>Pd54<br>Pd54<br>Pd54<br>Pd54<br>Pd54<br>Pd   | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>Core L#55<br>PU (#110<br>P#55<br>PU (#111<br>P#119<br>L2 (512KB)   |
| Group0           NUNNAGE L82 P42 (6368)           L3 (1698)           L2 (51248)         L2 (51248)           L4 (3288)         L16 (3288)           L14 (3289)         L16 (3288)           L14 (3280)         L14 (3288)           L14 (3280)         L14 (3288)           L14 (3280)         L11 (3280)           L9 (454)         PU (456)           P1 (456)         P244           P1 (456)         P244           P1 (456)         P324           P1 (456)         P424           P1 (456)         P424           P1 (456)         P424           P1 (456)         P424           P1 (457)         P436           P437         P436           P447         P446           P437         P446           P447         P446           P447         P446           P447         P446   
   
  | L3 (1640)<br>L2 (512K8) L2 (512K<br>L1d (32K8) L1d (32K<br>L1d (32K8) L11 (32K<br>L11 (32K8) L11 (32K<br>PU L872<br>PU L872<br>PU L872<br>PU L872<br>PU L873<br>PU L873  
   
   
   | 8) L2 (512K8)<br>8) L1d (32K8)<br>8) L11 (32K8)<br>7) Core L488<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>9 L97<br>1  
   
   
   | L2 (51268)<br>L1d (3268)<br>L11 (3268)<br>Core L#39<br>PU (#78<br>P239<br>PU (#79<br>P103  | L3 (10%)<br>L2 (512%) [<br>L16 (12%) [<br>L11 (12%) [<br>Core L460 P<br>P2 L40 P<br>P440 P<br>P3 L40 [<br>P3 L40 P   | L2 (512X0) [<br>L1d (22X0) [<br>L11 (22X0) [<br>Core LM41<br>PU L692<br>P441<br>P9105 [<br>P105]   | L2 (512X8) [<br>L1d (32X8) ]<br>L11 (32X8) [<br>Core L#42 ]<br>P422<br>P423<br>P4106 ]   
  | 2 (512K8)<br>.1d (32K8)<br>.11 (32K8)  | CroupD<br>NUMANOde L#1<br>13 (1649)<br>12 (512K8)<br>11d (32K8)<br>111 (32K8)<br>Core L#48<br>PU L#56<br>P#48<br>PU L#57<br>P#112<br>13 (1649)<br>12 (512K8)<br>11d (32K8)  | 1 P#3 (63G8)<br>12 (512K8)<br>1.1d (32K8)<br>1.1d (32K8)<br>1.11 (32K8)<br>Core L#49<br>PU (#99<br>P#113<br>1.1<br>1.2 (512K8)<br>1.1d (32K8)<br>1.1d (32K8)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#50<br>P#50<br>P#1(#10)<br>P#114<br>L2 (512K8)<br>L1d (32K8)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>L11 (32K8)<br>Core L#S1<br>PU L#102<br>P#115<br>L2 (512K8)<br>L12 (512K8)<br>L14 (32K8)  
  | 13         (10%)           12         (512x8)           14         (200)           11         (200)           11         (200)           11         (200)           11         (200)           11         (200)           11         (200)           13         (10%)           14         (212x8)           13         (10%)           12         (512x8)           14         (212x8)           14         (212x8)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>L11 (32K8)<br>Core L#53<br>PU L#106<br>P#513<br>PU L#107<br>P#117<br>L2 (512K8)<br>L1d (32K8)   
  | L2 (51288)<br>L1d (1288)<br>L11 (1288)<br>Core L#54<br>P#518<br>P#518<br>P454<br>P4 L#199<br>P#118<br>L2 (51288)<br>L1d (1288)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L855<br>PU (8110<br>P455<br>PU (8111<br>P4119<br>L2 (512K8)<br>L1d (32K8)   |
| Group0           NUNNMode L82 P82 (6368)           L3 (1698)           L2 (53248)         L2 (53248)           L3 (1698)           L14 (2328)         L14 (2328)           L14 (2328)         L14 (2328)           L14 (2328)         L14 (2328)           L11 (2328)         L11 (2328)           L11 (2328)         L11 (2328)           L11 (2328)         L11 (2328)           Core L832         Core L834           PU L656         P9957           PU L955         P4997           L3 (1098)         L1 (2328)           L3 (1098)         L2 (51208)           L3 (1098)         L2 (51208)           L3 (1098)         L2 (51208)           L3 (1098)         L3 (2428)           L3 (1098)         L3 (25128)           L3 (1098)         L1 (228)           L14 (228)         L14 (228)           L14 (228)         L14 (228)           L14 (228)         L14 (228)  
   
  | 13         (1649)           12         (512K8)         12         (512K)           140         (122K8)         14         (122K8)           141         (122K8)         141         (122K8)           141         (122K8)         141         (127K)           191         (111         (127K8)         141         (127K)           191         (111         (127K)         (111         (127K)           191         (127)         (127)         (127)         (127)           191         (127)         (127)         (127)         (127)           192         (10)         (11)         (11)         (11)         (11)           192         (11)         (127)         (11)         (11)         (11)         (11)           192         (11)         (127)         (11)  
   
   
  | <ul> <li>B) L2 (512KB)</li> <li>B) L1d (12KB)</li> <li>B) L11 (12KB)</li> <li>F) L71 (12KB)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>P 102</li> <li>e</li> </ul>   
   
   
  | L2 (512KB)<br>L1d (32KB)<br>L11 (32KB)<br>COTE 1829<br>PU L878<br>PU L878<br>PU 1878<br>PU 197<br>P1 197<br>P1 197   | L3 (16%)<br>L2 (512%)<br>L1 (12%)<br>L1 (12%)<br>Core L#40<br>PU L481<br>P2104   | L2 (512X0) [<br>L1d (12X0) [<br>L1d (12X0) [<br>Core L441<br>PU L802<br>P441<br>PU L803 [<br>P0105]  
   | L2 (512KB) [<br>L1d (J2KB) [<br>L11 (J2KB) [<br>Core L#42<br>PU L#85<br>PU L#85<br>P#206 [  | 2 (51288)<br>14 (3288)<br>11 (3288)<br>50re L#43<br>PU L#86<br>P43<br>PU L#87<br>P#107   | Group8<br>NUMANOde L#1<br>L3 (16M9)<br>L2 (512K8)<br>L1d (32K8)<br>Core L#48<br>P448<br>P448<br>P448<br>P448<br>P448<br>P448<br>P448<br>P   | P#3 (6368)<br>12 (512K8)<br>14 (32K8)<br>Core L#49<br>PU L#3<br>P4459<br>P4459<br>P4459<br>P41132<br>11 (32K8)<br>12 (512K8)<br>14 (32K8)<br>14 (   | L2 (512X8)<br>L1d (32X8)<br>L11 (32X8)<br>Core L450<br>PU L4100<br>P450<br>PU L4100<br>P414<br>P414<br>P414<br>L2 (512X8)<br>L1d (32X8)<br>L1d (32X8)  
  | L2 (51288)<br>L1d (3289)<br>Core L451<br>Pu L5102<br>Pe51<br>Pu L5102<br>Pe115<br>L2 (51288)<br>L1d (3288)<br>L1d (3288)  | 13         (16%)           12         (51288)           14         (288)           Core         1452           PU         141           PU         1450           91         141           13         (16%)           14         (2188)           13         (16%)           12         (5128)           14         (2288)           14         (2288)           114         (2288)  
   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#33<br>PU L#107<br>P#117<br>P#117<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L1d (32K8)  | L2 (51288)<br>L1d (3288)<br>L11 (3288)<br>Core L#54<br>P0 L#10<br>P554<br>P0 L#10<br>P554<br>P1 L#10<br>P1 L#10<br>P | L2 (51288)<br>L1d (3288)<br>L11 (3288)<br>Core L#55<br>PU (#11<br>9#15)<br>PU (#11<br>9#15)<br>L2 (51288)<br>L1d (3288)<br>L11 (3288)  |
| Group8           NUMMAGE L82 P82 (6368)           13 (1698)           12 (5326)         12 (53268)           14 (2380)         12 (53268)           14 (2380)         12 (53268)           14 (2380)         14 (2380)           11 (2380)         11 (2380)           11 (2380)         11 (2380)           11 (2380)         11 (2380)           11 (2380)         11 (2380)           11 (2381)         11 (2380)           12 (5328)         12 (5328)           13 (1695)         12 (53280)           14 (2380)         12 (53280)           14 (2380)         12 (53280)           14 (2380)         14 (2380)           13 (1295)         11 (2380)           14 (2380)         11 (2380)           15 (2380)         11 (2380)           16 (2380)         11 (2380)           15 (2380)         11 (2380)           15 (2380)         11 (2380)           15 (2588)         11 (2386)           15 (2588)         11 (2386)  
   
  | 13         (16490)           12         (512K8)         12         (512K)           11d         (12K8)         1.1         (12K)           111         (12K8)         1.11         (12K)           111         (12K)         (12K)         (12K) <td< td=""><td><ul> <li>a) L2 (512K8)</li> <li>b) L1d (32K8)</li> <li>b) L11 (32K8)</li> <li>c) L11 (32K8)</li> <lic) (32k8)<="" l11="" li=""> <lic) (32k8)<="" l11="" li=""></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></ul></td><td>L2 (512KB)<br/>L1d (22KB)<br/>L11 (22KB)<br/>Core L829<br/>PU (475<br/>P2(475<br/>P2(475<br/>P2(475<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475)<br/>P2(475</td><td>L3 (1646)<br/>L2 (512K8) [<br/>L16 (12K8) [<br/>L16 (12K8) [<br/>L11 (12K8) [<br/>Core L#46<br/>P0 L480 [<br/>P1 L480 ]<br/>P1 L480 [<br/>P1 L480 ]</td><td>L2 (512K8) [<br/>L1d (12K8) [<br/>L1d (12K8) [<br/>L11 (12K8) [<br/>Core L#41<br/>FV L#82  <br/>FV L#83  <br/>FV L#84  <br/>FV L#83  </td><td>L2 (51288) [<br/>L1d (3288) [<br/>L11 (3288) [<br/>Core L#42<br/>PU L#85<br/>P#106 [<br/>P106] [</td><td>2 (51248)<br/>14 (3248)<br/>11 (3248)<br/>14 (32</td><td>Group8<br/>NUMANOde L#3<br/>13 (1649)<br/>12 (51288)<br/>114 (3288)<br/>Core L#48<br/>P448<br/>P448<br/>P448<br/>P448<br/>P448<br/>P448<br/>P448<br/>P</td><td>P#3 (6308)           L2 (512K8)           L1 (32K8)           Core L#45           PU L99           P#1 (192K8)           L1 (32K8)           L2 (512K8)           L1 (32K8)           L1 (32K8)</td><td>L2 (512X8)<br/>L1d (32X8)<br/>L11 (32X8)<br/>Core L#50<br/>PU L#10<br/>PU L#10<br/>P#114<br/>L2 (512X8)<br/>L1d (32X8)<br/>L1d (32X8)<br/>L1d (32X8)</td><td>12 (51288)<br/>114 (1288)<br/>111 (1288)<br/>Core 1451<br/>PU (4102)<br/>PS11<br/>PU (4102)<br/>PS11<br/>113<br/>114 (1288)<br/>114 (1288)<br/>114 (1288)<br/>114 (1288)</td><td>13         (1640)           12         (51288)           11         (1280)           111         (1280)           111         (1280)           111         (1280)           12         (51288)           14         (250)           111         (1280)           12         (51288)           141         (280)           15         (260)</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core (#53<br/>PU L8107<br/>P#117<br/>P#117<br/>L2 (512K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d (32K8)</td><td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L854<br/>P0 (819)<br/>P8518<br/>P0 (819)<br/>P4118<br/>L12 (512X8)<br/>L14 (12X8)<br/>L14 (12X8)<br/>L14 (12X8)</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L4516<br/>P455<br/>PU (411)<br/>P415<br/>P41 (411)<br/>P415<br/>L1
(32K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>L14 (32K8)</td></td<>  
   | <ul> <li>a) L2 (512K8)</li> <li>b) L1d (32K8)</li> <li>b) L11 (32K8)</li> <li>c) L11 (32K8)</li> <lic) (32k8)<="" l11="" li=""> <lic) (32k8)<="" l11="" li=""></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></ul>   
   
   
  | L2 (512KB)<br>L1d (22KB)<br>L11 (22KB)<br>Core L829<br>PU (475<br>P2(475<br>P2(475<br>P2(475<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475)<br>P2(475 | L3 (1646)<br>L2 (512K8) [<br>L16 (12K8) [<br>L16 (12K8) [<br>L11 (12K8) [<br>Core L#46<br>P0 L480 [<br>P1 L480 ]<br>P1 L480 [<br>P1 L480 ]   | L2 (512K8) [<br>L1d (12K8) [<br>L1d (12K8) [<br>L11 (12K8) [<br>Core L#41<br>FV L#82  <br>FV L#83  <br>FV L#84  <br>FV L#83      | L2 (51288) [<br>L1d (3288) [<br>L11 (3288) [<br>Core L#42<br>PU L#85<br>P#106 [<br>P106] [  
   | 2 (51248)<br>14 (3248)<br>11 (3248)<br>14 (32 | Group8<br>NUMANOde L#3<br>13 (1649)<br>12 (51288)<br>114 (3288)<br>Core L#48<br>P448<br>P448<br>P448<br>P448<br>P448<br>P448<br>P448<br>P   | P#3 (6308)           L2 (512K8)           L1 (32K8)           Core L#45           PU L99           P#1 (192K8)           L1 (32K8)           L2 (512K8)           L1 (32K8)  | L2 (512X8)<br>L1d (32X8)<br>L11 (32X8)<br>Core L#50<br>PU L#10<br>PU L#10<br>P#114<br>L2 (512X8)<br>L1d (32X8)<br>L1d (32X8)<br>L1d (32X8)  | 12 (51288)<br>114 (1288)<br>111 (1288)<br>Core 1451<br>PU (4102)<br>PS11<br>PU (4102)<br>PS11<br>113<br>114 (1288)<br>114 (1288)<br>114 (1288)<br>114 (1288)   
  | 13         (1640)           12         (51288)           11         (1280)           111         (1280)           111         (1280)           111         (1280)           12         (51288)           14         (250)           111         (1280)           12         (51288)           141         (280)           15         (260)   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core (#53<br>PU L8107<br>P#117<br>P#117<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L1d (32K8)   
  | L2 (512X8)<br>L1d (12X8)<br>L11 (12X8)<br>Core L854<br>P0 (819)<br>P8518<br>P0 (819)<br>P4118<br>L12 (512X8)<br>L14 (12X8)<br>L14 (12X8)<br>L14 (12X8)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L4516<br>P455<br>PU (411)<br>P415<br>P41 (411)<br>P415<br>L1 (32K8)<br>L1d (32K8)<br>L1d (32K8)<br>L1d (32K8)<br>L14 (32K8)   |
| Group8           NUMMode L#2 P#2 (6368)           L3 (1098)           L2 (5120)         L2 (51200)           L16 (220)         L16 (2200)           L16 (220)         L16 (2200)           L11 (220)         L16 (2200)           L11 (220)         L11 (2200)           PU L#65         PU L#65           PU L#65         PU L#65           PU L#65         L2 (51208)           L3 (1090)         L1 (21200)           L3 (2120)         L1 (21200)           L14 (2200)         L14 (2200)           Core L#41         Core L#45           Core L#41         Core L#41           Core L#41         Core L#41 </td <td>13         (1640)           12         (512K8)         12         (512K8)           11d         (12K8)         1.11         (12K8)           111         (12K8)         1.11         (12K8)           12K9         (147)         (12K9)         (147)           12K9         2.0         PCI 43:00         (147)           2.0         PCI 43:00         Net: ensi         (147)</td> <td><ul> <li>b) L2 (512K0)</li> <li>b) L1d (12K0)</li> <li>b) L1d (12K0)</li> <li>core L#38</li> <li>P0 L#76</li> <li>P0 L#77</li> <li>p#102</li> <li>.0</li> <li>.1</li> <li>.2</li> <li>.2</li> </ul></td> <td>L2 (51260)<br/>L1d (1260)<br/>L11 (1260)<br/>L11 (1260)<br/>Core L839<br/>P0 (1879<br/>P9103)<br/>P0 (1879<br/>P9103)</td> <td>L3 (1649)<br/>L2 (512K8) [<br/>L1 (12K8) [<br/>L1 (12K8) [<br/>Core L#60 ]<br/>P9 L68 ]<br/>P9 L68 ]<br/>P1 164 ]</td> <td>L2 (51288) [<br/>L1d (3288) [<br/>L1d (3288) [<br/>L11 (3288) [<br/>P241]<br/>P2 L83]<br/>P2105</td> <td>L2 (512X8) [<br/>L1d (12X8) [<br/>L11 (12X8) [<br/>Core 1#42<br/>PU 1#85<br/>P#42<br/>PU 1#85<br/>P#106</td> <td>2 (512%)<br/>14 (32%)<br/>11 (32%)<br/>070 (44)<br/>PU (44)</td> <td>CroupB<br/>NUMMMode L8.3<br/>(1649)<br/>(2 (512K8)<br/>(11 (32K8)<br/>(11 (32K8)<br/>Core L848<br/>PU_897<br/>P418<br/>(11 (32K8)<br/>(13 (512K8)<br/>(14 (32K8)<br/>(14 (32K8))<br/>(14 (32K8)<br/>(14 (32K8))<br/>(14 (32K8))<br/>(15 (612K8))<br/>(15 (612K8))<br/>(16 (612K8))<br/>(17 (612K8</td> <td>1 P#3 (6308)<br/>12 (512K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>PU (898)<br/>PU (899)<br/>P4133<br/>12 (512K8)<br/>14 (22K8)<br/>14 (22K8)<br/>1</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L#50<br/>PU (#10)<br/>PU (#10)<br/>PU (#10)<br/>PU (#11<br/>L1 (312K8)<br/>L11 (32K8)<br/>Core L#58<br/>Core L#58</td> <td>12         (51288)           1.1d         (2289)           1.11         (2289)           92.11         (21288)           1.2         (51288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)</td> <td>13         (16%)           12         (51288)           11d         (1288)           111         (1288)           Core         1852           PU         (16)           PU         (16)           12         (51288)           111         (1288)           12         (51288)           111         (1288)           Core         1850           PU         (11)           PU         (1280)</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L1 (32K8)<br/>Core L#33<br/>PU (#106)<br/>P#53<br/>PU (#107<br/>P#117<br/>L2 (512K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>Core L#51<br/>Core L#51</td> <td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#54<br/>P0 (419)<br/>P518<br/>P1 (419)<br/>P1 (412X8)<br/>L1d (12X8)<br/>L14 (12X8)<br/>Core L#52<br/>Core L#52</td> <td>L2 (512X8)<br/>L1d (32X8)<br/>(L1 (32X8)<br/>Core L855<br/>PU (#110<br/>P#05<br/>PU (#111<br/>P#119<br/>L2 (512X8)<br/>L1d (32X8)<br/>L1d (32X8)<br/>Core L851<br/>Core L851<br/>PU (#126</td>   
   | 13         (1640)           12         (512K8)         12         (512K8)           11d         (12K8)         1.11         (12K8)           111         (12K8)         1.11         (12K8)           12K9         (147)         (12K9)         (147)           12K9         2.0         PCI 43:00         (147)           2.0         PCI 43:00         Net: ensi         (147)  
   
   
   | <ul> <li>b) L2 (512K0)</li> <li>b) L1d (12K0)</li> <li>b) L1d (12K0)</li> <li>core L#38</li> <li>P0 L#76</li> <li>P0 L#77</li> <li>p#102</li> <li>.0</li> <li>.1</li> <li>.2</li> <li>.2</li> </ul>   
   
   
   | L2 (51260)<br>L1d (1260)<br>L11 (1260)<br>L11 (1260)<br>Core L839<br>P0 (1879<br>P9103)<br>P0 (1879<br>P9103)  | L3 (1649)<br>L2 (512K8) [<br>L1 (12K8) [<br>L1 (12K8) [<br>Core L#60 ]<br>P9 L68 ]<br>P9 L68 ]<br>P1 164 ]   | L2 (51288) [<br>L1d (3288) [<br>L1d (3288)
[<br>L11 (3288) [<br>P241]<br>P2 L83]<br>P2105  | L2 (512X8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>Core 1#42<br>PU 1#85<br>P#42<br>PU 1#85<br>P#106  | 2 (512%)<br>14 (32%)<br>11 (32%)<br>070 (44)<br>PU (44)  | CroupB<br>NUMMMode L8.3<br>(1649)<br>(2 (512K8)<br>(11 (32K8)<br>(11 (32K8)<br>Core L848<br>PU_897<br>P418<br>(11 (32K8)<br>(13 (512K8)<br>(14 (32K8)<br>(14 (32K8))<br>(14 (32K8)<br>(14 (32K8))<br>(14 (32K8))<br>(15 (612K8))<br>(15 (612K8))<br>(16 (612K8))<br>(17 (612K8  | 1 P#3 (6308)<br>12 (512K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>PU (898)<br>PU (899)<br>P4133<br>12 (512K8)<br>14 (22K8)<br>14 (22K8)<br>1   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#50<br>PU (#10)<br>PU (#10)<br>PU (#10)<br>PU (#11<br>L1 (312K8)<br>L11 (32K8)<br>Core L#58<br>Core L#58  | 12         (51288)           1.1d         (2289)           1.11         (2289)           92.11         (21288)           1.2         (51288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)           1.1d         (2288)   
  | 13         (16%)           12         (51288)           11d         (1288)           111         (1288)           Core         1852           PU         (16)           PU         (16)           12         (51288)           111         (1288)           12         (51288)           111         (1288)           Core         1850           PU         (11)           PU         (1280)  | L2 (512K8)<br>L1d (32K8)<br>L1 (32K8)<br>Core L#33<br>PU (#106)<br>P#53<br>PU (#107<br>P#117<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>Core L#51<br>Core L#51  
  | L2 (512X8)<br>L1d (12X8)<br>L11 (12X8)<br>Core L#54<br>P0 (419)<br>P518<br>P1 (419)<br>P1 (412X8)<br>L1d (12X8)<br>L14 (12X8)<br>Core L#52<br>Core L#52   | L2 (512X8)<br>L1d (32X8)<br>(L1 (32X8)<br>Core L855<br>PU (#110<br>P#05<br>PU (#111<br>P#119<br>L2 (512X8)<br>L1d (32X8)<br>L1d (32X8)<br>Core L851<br>Core L851<br>PU (#126   |
| Groupd           NUMMode L82 P82 (6368)           L3 (1098)           L2 (5120)         L2 (5120)           L3 (1098)           L4 (1092)           L16 (1220)         L16 (1220)           L16 (1220)         L16 (1220)           L11 (1220)         L11 (1220)           L11 (1220)         L11 (1220)           PU L85         PU L85           PU L85         PU L85           PU L85         PU L85           PU L85         PU L85           PU L85         L16 (1220)           L11 (1220)         L1 (1220)           L3 (1098)         L2 (51208)           L2 (5120)         L2 (51208)           L2 (5120)         L2 (51208)           L16 (1220)         L16 (1220)           L11 (1220)         L11 (1220)           L11 (1220)         L11 (1220)           L11 (1220)         L11 (1220)           Core L84         Core L83           PU L85         PU L85           PU L85         L16 (1220)           L11 (1220)         L11 (1220)           L11 (1220)         L11 (1220)           PU L85         PU L850           PU L850         PU L850   
   
  | 13         (1640)           12         (512K8)         12         (512K8)           11d         (122K8)         1.13         (122K8)           111         (122K8)         1.11         (122K8)           111         (122K8)         (122K8)         (122K8)           111         (122K8)         (122K8) <td><ul> <li>b) L2 (512(6))</li> <li>b) L1d (12(6))</li> <li>b) L1d (12(6))</li> <li>c) L11 (12(6))</li> <li>7</li> <li>7</li> <li>Core L#38</li> <li>PU L#77</li> <li>P102</li> <li>0</li> <li>0</li> <li>0</li> <li>1</li> <li>0</li> <li>1</li> <li>2</li> <li>2</li> </ul></td> <td>L2 (51268)<br/>L1d (3268)<br/>L11 (3268)<br/>L11 (3268)<br/>Core L#39<br/>PU (#78<br/>PE39<br/>PU (#79<br/>PE103</td> <td>L3 (1646)<br/>L2 (51286) [<br/>L16 (3286) [<br/>L11 (3286) [<br/>Core L#40<br/>P4 (287) [<br/>P4 (287) [<br/>P</td> <td>12 (51288) [<br/>11d (3288) [<br/>11d (3288) [<br/>111 (3288) [<br/>11</td> <td>L2 (512X8) [<br/>L1d (12X8) [<br/>L11 (12X8) [<br/>Core L#42 P<br/>PU L#85 P<br/>P10 L#85 P<br/>P10 L#85 P<br/>P10 L#85 P</td> <td>2 (512K8)<br/>16 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>12 (312K8)<br/>13 (312K8)<br/>14 (</td> <td>GroupB<br/>NUMANOde L8.3<br/>(16490)<br/>(2 (512X8)<br/>(11 (32X8)<br/>(11 (32X8)<br/>Core L848<br/>PU (857<br/>P448<br/>PU (857<br/>P4112<br/>(13 (16490)<br/>(12 (512X8)<br/>(14 (32X8)<br/>(14 (32X8)<br/>(14 (32X8)<br/>(15 (25))<br/>(15 (25))<br/>(16 (25))<br/>(17 (25))</td> <td>1 2 (512K8)<br/>12 (512K8)<br/>14 (32K8)<br/>11 (32K8)<br/>Core 1849<br/>PU (899<br/>PH113<br/>12 (512K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>Core 1857<br/>PU (817)<br/>PU (</td> <td>12 (512K8)<br/>11 (22K8)<br/>11 (22K8)<br/>Core 1#59<br/>PU (#10)<br/>P#59<br/>PU (#10)<br/>P#114<br/>12 (512K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>11 (22K8)<br/>12 (512K8)<br/>12 (512K8)<br/>12 (512K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (512K8)<br/>14 (512K8)<br/>14 (512K8)<br/>15 (512K8)<br/>15 (512K8)<br/>16 (512K8)<br/>17 (512K8)<br/>17 (512K8)<br/>17 (512K8)<br/>18 (512K8)<br/>11 (22K8)<br/>11 (25K8)<br/>11 (25K8</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L851<br/>P#115<br/>PU L8102<br/>P#115<br/>L12 (512K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>P#115<br/>L1d (32K8)<br/>L1d (32K8)<br/>P#115<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>P#115<br/>L1d (32K8)<br/>L1d (32K8</td> <td>13 (16%)<br/>12 (51208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>12 (51208)<br/>13 (16%)<br/>12 (51208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>11 (2208)<br/>12 (51208)<br/>13 (16%)<br/>14 (2208)<br/>15 (16%)<br/>15 (16%)<br/>16 (16%)<br/>17 (16%)<br/>17 (16%)<br/>18 (</td> <td>12 (512K8)<br/>11 (22K8)<br/>(11 (22K8)<br/>Core 1#53<br/>PU (#106)<br/>P#53<br/>PU (#107)<br/>P#513<br/>PU (#107)<br/>P#513<br/>PU (#107)<br/>P#513<br/>Core 1#61<br/>(11 (22K8)<br/>Core 1#62<br/>PU (#122)<br/>PU (#12)<br/>PU (#122)<br/>PU (#12)<br/>PU (#12)</td> <td>12 (512/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>0 (510)<br/>11 (22/6)<br/>10 (512/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>11 (22/6)<br/>12 (512/6)<br/>13 (22/6)<br/>14 (22/6)</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L855<br/>PU (8110<br/>P855)<br/>PU (8110<br/>P855)<br/>PU (812)<br/>L11 (32K8)<br/>L12 (512K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>Core L852<br/>PU (812)<br/>PU (8</td> | <ul> <li>b) L2 (512(6))</li> <li>b) L1d (12(6))</li> <li>b) L1d (12(6))</li> <li>c) L11 (12(6))</li> <li>7</li> <li>7</li> <li>Core L#38</li> <li>PU L#77</li> <li>P102</li> <li>0</li> <li>0</li> <li>0</li> <li>1</li> <li>0</li> <li>1</li> <li>2</li> <li>2</li> </ul>   
   
   
  | L2 (51268)<br>L1d (3268)<br>L11 (3268)<br>L11 (3268)<br>Core L#39<br>PU (#78<br>PE39<br>PU (#79<br>PE103   | L3 (1646)<br>L2 (51286) [<br>L16 (3286) [<br>L11 (3286) [<br>Core L#40<br>P4 (287) [<br>P4 (287) [<br>P  | 12 (51288) [<br>11d (3288) [<br>11d (3288) [<br>111 (3288) [<br>11   | L2 (512X8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>Core L#42 P<br>PU L#85 P<br>P10 L#85 P<br>P10 L#85 P<br>P10 L#85 P  
   | 2 (512K8)<br>16 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>12 (312K8)<br>13 (312K8)<br>14 (   | GroupB<br>NUMANOde L8.3<br>(16490)<br>(2 (512X8)<br>(11 (32X8)<br>(11 (32X8)<br>Core L848<br>PU (857<br>P448<br>PU (857<br>P4112<br>(13 (16490)<br>(12 (512X8)<br>(14 (32X8)<br>(14 (32X8)<br>(14 (32X8)<br>(15 (25))<br>(15 (25))<br>(16 (25))<br>(17 (25)) | 1 2 (512K8)<br>12 (512K8)<br>14 (32K8)<br>11 (32K8)<br>Core 1849<br>PU (899<br>PH113<br>12 (512K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>Core 1857<br>PU (817)<br>PU (   | 12 (512K8)<br>11 (22K8)<br>11 (22K8)<br>Core 1#59<br>PU (#10)<br>P#59<br>PU (#10)<br>P#114<br>12 (512K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>11 (22K8)<br>12 (512K8)<br>12 (512K8)<br>12 (512K8)<br>12 (512K8)<br>12 (512K8)<br>13 (512K8)<br>14 (512K8)<br>14 (512K8)<br>15 (512K8)<br>15 (512K8)<br>16 (512K8)<br>17 (512K8)<br>17 (512K8)<br>17 (512K8)<br>18 (512K8)<br>11 (22K8)<br>11 (25K8)<br>11 (25K8  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L851<br>P#115<br>PU L8102<br>P#115<br>L12 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>P#115<br>L1d (32K8)<br>L1d (32K8)<br>P#115<br>L1d (32K8)<br>L1d (32K8)<br>L1d (32K8)<br>L1d (32K8)<br>P#115<br>L1d (32K8)<br>L1d (32K8  | 13 (16%)<br>12 (51208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>12 (51208)<br>13 (16%)<br>12 (51208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>11 (2208)<br>12 (51208)<br>13 (16%)<br>14 (2208)<br>15 (16%)<br>15 (16%)<br>16 (16%)<br>17 (16%)<br>17 (16%)<br>18 ( | 12 (512K8)<br>11 (22K8)<br>(11 (22K8)<br>Core 1#53<br>PU (#106)<br>P#53<br>PU (#107)<br>P#513<br>PU (#107)<br>P#513<br>PU (#107)<br>P#513<br>Core 1#61<br>(11 (22K8)<br>Core 1#62<br>PU (#122)<br>PU (#12)<br>PU (#122)<br>PU (#12)<br>PU (#12)  | 12 (512/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>0 (510)<br>11 (22/6)<br>10 (512/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>11 (22/6)<br>12 (512/6)<br>13 (22/6)<br>14 (22/6)   
   | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L855<br>PU (8110<br>P855)<br>PU (8110<br>P855)<br>PU (812)<br>L11 (32K8)<br>L12 (512K8)<br>L14 (32K8)<br>L14 (32K8)<br>Core L852<br>PU (812)<br>PU (8 |
| Corcupil           NUMMAGE LEZ PF2 (6368)           L3 (1018)           L2 (51248)         L2 (51248)           L3 (1018)           L2 (51248)         L2 (51248)           L4 (3228)         L16 (3228)           L16 (3228)         L16 (3228)           L17 (3228)         L11 (3228)           L18 (3228)         L14 (3228)           L19 (3258)         L11 (3228)           L10 (3259)         L11 (3228)           L11 (3250)         L11 (3228)           L11 (3251)         L1 (3228)           L11 (3252)         L2 (5128)           L2 (5128)         L2 (5128)           L3 (1018)         L2 (5128)           L3 (1018)         L2 (5128)           L3 (1018)         L3 (5128)           L3 (1018)         L3 (5128)           L3 (1018)         L3 (5128)           L16 (3228)         L16 (3228)           L16 (3228)         L16 (3228)           L11 (3228)         L11 (3228)           L11 (3228)         L11 (3228)           L11 (328)         L11 (328)           Core L84         P0 L992           P0 L983         P0 L991           P0 L984         P0 L992 <tr< td=""><td>L3 (1649)<br/>L2 (512KB) L2 (512K<br/>L1d (32KB) L1d (32K<br/>L1d (32KB) L1d (32K<br/>L1d (32KB) L1d (32K<br/>PU (47) P0 (47)<br/>P0 (47) P0 (47) P0 (47) P0 (47)<br/>P0 (47) P0 (47</td><td>8) 12 (512K8)<br/>1) 11 (32K8)<br/>8) 11 (32K8)<br/>7) Core 1438<br/>70 (47%<br/>7458)<br/>70 (47%<br/>74)<br/>70 (47%<br/>74)<br/>70 (47%<br/>74)<br/>70 (47%<br/>74)<br/>70 (47%<br/>74)<br/>70 (47%<br/>75)<br/>70 (4</td><td>L2 (51248)<br/>L1d (1228)<br/>L11 (1228)<br/>Core 4839<br/>P0 (475<br/>P0 (475<br/>P10)<br/>P10 (475<br/>P10)</td><td>L3 (1646)<br/>L2 (51263) [<br/>L1d (3266) [<br/>L1d (3266) [<br/>L11 (3266) [<br/>79 (466) [<br/>70 (466) [</td><td>12 (51288) [<br/>13 (3289) [<br/>11 (3289) [<br/>11 (3289) [<br/>11 (3289) [<br/>11 (3289) [<br/>11 (3289) [<br/>12 (31289) [<br/>12 (31289) [<br/>13 (31289) [<br/>14 (3128</td><td>L2 (512/8) [<br/>L1d (32/8) [<br/>L1d (32/8) [<br/>Core L#42 ]<br/>PU L#85<br/>P442 ]<br/>PU L#85<br/>P4106 ]</td><td>2 (512K8)<br/>14 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>007C L#43<br/>PU L#85<br/>P443<br/>PU L#87<br/>P4107</td><td>Group8<br/>RUMANGOE (#2<br/>13 (1649)<br/>12 (512K8)<br/>14 (32K8)<br/>14 (32K8)<br/>11 (32K8)<br/>COTE LEAR<br/>PU L850<br/>P448<br/>PU L857<br/>P411<br/>11 (32K8)<br/>11 (32K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (1649)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>14 (32K8)<br/>15 (32K8)<br/>14 (32K8)</td><td>P#3 (6368)           L2 (512K8)           L1d (32K8)           L1d (32K8)           D(11 (32K8))           COTE LE45           PU (499)           P445           PU (499)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L11 (32K8)           COTE LE57           PU (4114)           P817</td><td>12 (512K8)<br/>11 (22K8)<br/>(11 (22K8)<br/>PU (210)<br/>PU (210)<br/>PU (210)<br/>PU (211)<br/>(12 (512K8)<br/>11 (22K8)<br/>(13 (22K8)<br/>(14 (22K8)<br/>(14</td><td>12 (512K8)           11d (32K8)           111 (32K8)           0 Core L851           PU L8107           P8518           P9118           11d (32K8)           11d (32K8)<td>L1 (16%)<br/>L2 (51208)<br/>L1d (1208)<br/>L1d (1208)<br/>FU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>L1d (1208)<br/>L1d (1208)<br/>Core L869<br/>PU (4724)<br/>PG0<br/>PU (4724)<br/>PG0<br/>PG0<br/>PU (4724)<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0</td><td>12 (512K8)<br/>11d (32K8)<br/>111 (32K8)<br/>Core L#33<br/>PU L#196<br/>P#513<br/>PU L#197<br/>122 (512K8)<br/>114 (32K8)<br/>114 (32K8)<br/>Core L#61<br/>PU L#123<br/>P#123<br/>P#123</td><td>12 (51208)<br/>11d (3208)<br/>11t (3208)<br/>Core 1854<br/>PU (8188<br/>P#518<br/>PU (8188)<br/>PU (8188)<br/>PU (8188)<br/>PU (8188)<br/>PU (8128)<br/>11d (3208)<br/>11d (32</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>F0 (4110<br/>P455)<br/>P0 (4110<br/>P455)<br/>P1 (4110<br/>P4119<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d</td></td></tr<> | L3 (1649)<br>L2 (512KB) L2 (512K<br>L1d (32KB) L1d (32K<br>L1d (32KB) L1d (32K<br>L1d (32KB) L1d (32K<br>PU (47) P0 (47)<br>P0 (47) P0 (47) P0 (47) P0 (47)<br>P0 (47) P0 (47  
   
   
   | 8) 12 (512K8)<br>1) 11 (32K8)<br>8) 11 (32K8)<br>7) Core 1438<br>70 (47%<br>7458)<br>70 (47%<br>74)<br>70 (47%<br>74)<br>70 (47%<br>74)<br>70 (47%<br>74)<br>70 (47%<br>74)<br>70 (47%<br>75)<br>70 (4  
   
   | L2 (51248)<br>L1d (1228)<br>L11 (1228)<br>Core 4839<br>P0 (475<br>P0 (475<br>P10)<br>P10 (475<br>P10)   
  | L3 (1646)<br>L2 (51263) [<br>L1d (3266) [<br>L1d (3266) [<br>L11 (3266) [<br>79 (466) [<br>70 (466) [  | 12 (51288) [<br>13 (3289) [<br>11 (3289) [<br>11 (3289) [<br>11 (3289) [<br>11 (3289) [<br>11 (3289) [<br>12 (31289) [<br>12 (31289) [<br>13 (31289) [<br>14 (3128   | L2 (512/8) [<br>L1d (32/8) [<br>L1d (32/8) [<br>Core L#42 ]<br>PU L#85<br>P442 ]<br>PU L#85<br>P4106 ]  | 2 (512K8)<br>14 (32K8)<br>11 (32K8)<br>11 (32K8)<br>007C L#43<br>PU L#85<br>P443<br>PU L#87<br>P4107   | Group8<br>RUMANGOE (#2<br>13 (1649)<br>12 (512K8)<br>14 (32K8)<br>14 (32K8)<br>11 (32K8)<br>COTE LEAR<br>PU L850<br>P448<br>PU L857<br>P411<br>11 (32K8)<br>11 (32K8)<br>12 (512K8)<br>12 (512K8)<br>13 (1649)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>15 (32K8)<br>14 (32K8)  | P#3 (6368)           L2 (512K8)           L1d (32K8)           L1d (32K8)           D(11 (32K8))           COTE LE45           PU (499)           P445           PU (499)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L11 (32K8)           COTE LE57           PU (4114)           P817   
  | 12 (512K8)<br>11 (22K8)<br>(11 (22K8)<br>PU (210)<br>PU (210)<br>PU (210)<br>PU (211)<br>(12 (512K8)<br>11 (22K8)<br>(13 (22K8)<br>(14  | 12 (512K8)           11d (32K8)           111 (32K8)           0 Core L851           PU L8107           P8518           P9118           11d (32K8)           11d (32K8) <td>L1 (16%)<br/>L2 (51208)<br/>L1d (1208)<br/>L1d (1208)<br/>FU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>PU (4704)<br/>L1d (1208)<br/>L1d (1208)<br/>Core L869<br/>PU (4724)<br/>PG0<br/>PU (4724)<br/>PG0<br/>PG0<br/>PU (4724)<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0<br/>PG0</td> <td>12 (512K8)<br/>11d (32K8)<br/>111 (32K8)<br/>Core L#33<br/>PU L#196<br/>P#513<br/>PU L#197<br/>122 (512K8)<br/>114 (32K8)<br/>114 (32K8)<br/>Core L#61<br/>PU L#123<br/>P#123<br/>P#123</td> <td>12 (51208)<br/>11d (3208)<br/>11t (3208)<br/>Core 1854<br/>PU (8188<br/>P#518<br/>PU (8188)<br/>PU (8188)<br/>PU (8188)<br/>PU (8188)<br/>PU (8128)<br/>11d (3208)<br/>11d (32</td> <td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>F0 (4110<br/>P455)<br/>P0 (4110<br/>P455)<br/>P1 (4110<br/>P4119<br/>L1d (32K8)<br/>L1d (32K8)<br/>L1d</td> | L1 (16%)<br>L2 (51208)<br>L1d (1208)<br>L1d (1208)<br>FU (4704)<br>PU (4704)<br>PU (4704)<br>PU (4704)<br>PU (4704)<br>PU (4704)<br>L1d (1208)<br>L1d (1208)<br>Core L869<br>PU (4724)<br>PG0<br>PU (4724)<br>PG0<br>PG0<br>PU (4724)<br>PG0<br>PG0<br>PG0<br>PG0<br>PG0<br>PG0<br>PG0<br>PG0  | 12 (512K8)<br>11d (32K8)<br>111 (32K8)<br>Core L#33<br>PU L#196<br>P#513<br>PU L#197<br>122 (512K8)<br>114 (32K8)<br>114 (32K8)<br>Core L#61<br>PU L#123<br>P#123<br>P#123   | 12 (51208)<br>11d (3208)<br>11t (3208)<br>Core 1854<br>PU (8188<br>P#518<br>PU (8188)<br>PU (8188)<br>PU (8188)<br>PU (8188)<br>PU (8128)<br>11d (3208)<br>11d (32  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>F0 (4110<br>P455)<br>P0 (4110<br>P455)<br>P1 (4110<br>P4119<br>L1d (32K8)<br>L1d   |
| Group8           NUMMAGE LE2 PR2 (6368)           L3 (1698)           L2 (51268)         L2 (51268)           L2 (51268)         L2 (51268)           L16 (3208)         L2 (51268)           L16 (3208)         L16 (3208)           L17 (3208)         L16 (3208)           L18 (3208)         L11 (3208)           L11 (3208)         L1 (3208)           L11 (3208)         L2 (51208)           L2 (51208)         L2 (51208)           L2 (51208)         L2 (51208)           L16 (3208)         L16 (3208)           L16 (3208)         L16 (3208)           L11 (3208)         L11 (3208)           L   
   
  | L3 (1640)<br>L2 (512K8) L2 (512K<br>L16 (72K8) L16 (72K<br>L16 (72K8) L16 (72K<br>PU L872<br>PU L872<br>PU L872<br>PU L873<br>PU L873<br>PU L873<br>PU L873<br>PU L873<br>PU L87<br>PU L873<br>PU L87<br>PU  
   
   
  | 8)         L2 (512K8)           8)         L1d (32K8)           8)         L1 (32K8)           7)         Gore (#38)           70 (1970)           7438           90 (1970)           7410           10 (1970)           11 (1970)           11 (1970)           12 (1970)           13 (1970)           14 (1970)           15 (1970)           16 (1970)           17 (1970)           18 (1970)           19 (1970)           10 (1970)           10 (1970)           11 (1970)           12 (1970)           13 (1970)           14 (1970)           15 (1970)           16 (1970)           17 (1970)           18 (1970)           19 (1970)           19 (1970)           19 (1970)           10 (1970)           10 (1970)           11 (1970)           11 (1970)           11 (1970)           11 (1970)           11 (1970)           12 (1970)           13 (1970)           14 (1970)           14 (1970)   
   
   
  | L2 (51288)<br>L1d (3220)<br>L11 (3228)<br>D (478<br>P0 (478<br>P0 (478<br>P0 (479<br>P1 (378)<br>P0 (479<br>P1 (378)   | L3 (1996)<br>L2 (51268)<br>L1 (51268)<br>L1 (3289)<br>U11 (3299)<br>COTE L489<br>PU L481<br>PU L481<br>PU L481<br>P1 L48   | L2 (512K8) [<br>L1d (12K8) [<br>L11 (12K8) [<br>PU L482 P441<br>PU L482 P441<br>PU L483 P441<br>PU L483 [<br>P441 P441 P441 P441 P441 P441 P441 P441   | L2 (512K8) [<br>L1d (12K8) [<br>L11 (12K8) [<br>Core L#42  <br>PU L#45  <br>P422  <br>PU L#45  <br>P10 L  | 2 (51248)<br>14 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>12 (244)<br>14 (244)   | Group8<br>RUMANGOE (#2<br>13 (1649)<br>12 (512K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>12 (512K8)<br>13 (1649)<br>12 (512K8)<br>14 (32K8)<br>14 (32K8)<br>11 (32K8)<br>12 (512K8)<br>12 (512K8)<br>13 (1649)<br>14 (32K8)<br>14 (32K8)<br>14 (32K8)<br>15 (32K8)<br>14 (32K8)<br>15 (32K8)<br>16 (32K8)<br>17 (32K8)<br>17 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>18 (32K8)<br>19 (32K8)<br>18 (32K8)<br>19 (32K8)<br>18 (32K8)<br>19 (32K8)<br>19 (32K8)<br>11 (32  | L2 (512K8)<br>L1 (512K8)<br>L1 (32K8)<br>L1 (32K8)<br>L1 (32K8)<br>PU L498<br>PU L498<br>PU L498<br>PU L499<br>PU L497<br>PU L414<br>PU L415<br>PU L415   | L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L858<br>PU L810<br>P250<br>PU L8101<br>P14<br>L1d (12K8)<br>L1d (12K8)<br>Core L858<br>PU L810<br>P250<br>L11 (12K8)<br>Core L858<br>PU L810<br>P350<br>P1 L810<br>P1   | L2 (312K8)<br>L1d (12X8)<br>L11 (12X8)<br>L11 (12X8)<br>PU (112<br>PU (112)<br>PU (113)<br>PU (113)<br>L1d (12X8)<br>L1d (12X8)<br>L1d (12X8)<br>Core (153)<br>PU (111)<br>PS59<br>PU (113)<br>PU (113)<br>PS50 (0,0,0,0)   
   | L3 (1649)<br>L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L852<br>PU L8154<br>PF116<br>L1 (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L860<br>PU L8120<br>PF024<br>PU L8121<br>PF024  | L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L11 (32K8)<br>Ore L#53<br>PU L#106<br>P#33<br>PU L#107<br>PU L#107<br>PU L#107<br>PL107<br>L1d (32K8)<br>L1d (32K8)  | L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L854<br>PU L8109<br>P954<br>PU L8109<br>P10 L8109<br>P10 L8109<br>L11 (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L852<br>PU L8124<br>P422<br>PU L8125<br>P8126   
   | L2 (512KB)<br>L1d (32KB)<br>Core L855<br>PU (8110<br>PU (8110<br>PU (8110<br>PU (812)<br>L1d (32KB)<br>L1d (32KB)<br>L1d (32KB)<br>L1d (32KB)<br>L1d (32KB)<br>PU (8126<br>PPU (8127<br>PR127  |
| Group8           NUNNAGE L82 P82 (6368)           L3 (1698)           L2 (51208)         L2 (51208)           L4 (3280)         L2 (51208)           L16 (3280)         L16 (3280)           L16 (3280)         L16 (3280)           L11 (3280)         L11 (3280)           L11 (3281)         PU L860           P923         P9246           P1 L865         P924           P0 L869         L2 (51280)           L2 (51280)         L2 (51280)           L3 (1698)         L16 (3280)           L12 (3128)         L16 (3280)           L16 (3280)         L16 (3280)           L16 (3280)         L16 (3280)           L11 (3280)         L11 (3280)           L11 (3280)   
   
  | L3 (1640)<br>L2 (512K8) L2 (512K<br>L1d (32K8) L1d (32K<br>L1d (32K8) L11 (32K<br>L11 (32K8) L11 (32K<br>PU L372<br>PU L372  
   
   
   | 8) L2 (512K8)<br>8) L1d (32K8)<br>8) L11 (32K8)<br>9) L11 (32K8)<br>7 Core L488<br>PU L477<br>9 L477<br>9 L477<br>9 L477<br>9 L477<br>9 102<br>9 10<br>9 10<br>9 10<br>9 102<br>9 1   
   
  | L2 (5128)<br>L1d (328)<br>L1d (328)<br>L11 (328)<br>PU (#78)<br>PU (#78)<br>PU (#78)<br>PU (#79)<br>P103   
   | L3 (1646)<br>L2 (51268)<br>L3 (1728)<br>L11 (1728)<br>Core L460<br>P0 L681<br>P1 L681<br>P1 L681<br>P1 L681<br>P1 L681   | L2 (312K8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>TU .682 ]<br>P441<br>PU .683 [<br>P8105 ]  | L2 (512K8) [<br>L1d (12K8) [<br>L11 (12K8) [<br>Core L#42  <br>FU L#85  | 2 (51248)<br>14 (3248)<br>11 (3248)<br>50re L#43<br>PU L#87<br>P443<br>PU L#87<br>P9107  | Group8<br>RUMMAdde (#2<br>13 (1649)<br>12 (512K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>0 (10 (12 (12 (12 (12 (12 (12 (12 (12 (12 (12  
  | 1 P#3 (6368)<br>12 (512K8)<br>11d (32K8)<br>111 (32K8)<br>111 (32K8)<br>111 (32K8)<br>111 (32K8)<br>112 (512K8)<br>114 (32K8)<br>114   | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L850<br>PU L810<br>P250<br>PU L8101<br>P350<br>L11 (12K8)<br>L14 (12K8)<br>Core L858<br>PU L8116<br>P555<br>PU L8117<br>P32<br>20 32 pt  | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L851<br>PU (102)<br>P011<br>P011<br>P011<br>P011<br>P011<br>P011<br>P011<br>P01  
   | 13 (1640)<br>12 (512K8)<br>11 (12K8)<br>11 (12K8)<br>11 (12K8)<br>0 (12K8)<br>0 (12K8)<br>0 (12K8)<br>12 (512K8)<br>13 (1640)<br>12 (512K8)<br>14 (12K8)<br>14 (12K8)<br>0 (12K8)<br>0 (12K8)<br>0 (12K8)<br>11 (12K8)<br>0 (12K8)<br>0 (12K8)<br>0 (12K8)<br>11 (12K8)<br>12 (12K8)<br>13 (1640)<br>14 (12K8)<br>14 (12K8)<br>14 (12K8)<br>15 (12K8)<br>15 (12K8)<br>16 (12K8)<br>17 (12K8)<br>17 (12K8)<br>18 (12                                 | 12 (512K8)<br>11d (32K8)<br>111 (32K8)<br>Core L#33<br>PU L#106<br>P#33<br>PU L#107<br>PF117<br>114 (32K8)<br>114 (32K8)<br>Core L#61<br>PU L#122<br>P611<br>PU L#122<br>P6125   | L2 (51289)<br>L1d (1289)<br>L11 (1288)<br>Core L854<br>PU L8109<br>P254<br>PU L8109<br>P1 L8109<br>L11 (1289)<br>L11 (1289)<br>L11 (1289)<br>Core L862<br>PU L8124<br>P622<br>PU L8125<br>P8126   | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L#S5<br>PU (#110<br>P#55<br>PU (#111<br>P#119<br>L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L#63<br>PU (#122<br>P#612<br>PU (#122<br>P#612  
   |
| Groupd           NUMMAGE LE2 PR2 (6368)           L2 (5126)         L2 (5126)           L3 (1698)           L4 (3268)         L3 (13268)           L4 (3268)         L4 (3268)           L1 (3268)         L1 (3268)           PU (864)         PU (864)           PU (864)         PU (869)           PU (865)         PU (870)           PU (865)         PU (870)           PU (865)         L2 (51268)           L3 (1099)         L3 (1099)           L3 (1099)         L1 (3220)           L3 (1209)         L1 (3220)           L1 (3220)         L1 (3220)      <  
   
  | 13         (1649)           12         (512K8)         12         (512K)           116         (122K8)         114         (122K8)           111         (122K8)         114         (122K8)           111         (122K8)         114         (127K8)           111         (127K8)         114         (127K8)           112         2.0         PCI         13/00           12.0         PCI         13/00         (147K8)           12.0         PCI         13/00         (147K8)           12.0         PCI         13/00         (147K8)           12.0         PCI         13/00         (147K8) </td <td><ul> <li>b) L2 (512K0)</li> <li>b) L1d (12K0)</li> <li>b) L11 (12K8)</li> <li>c) L11 (12K8)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a<td>L2 (5126)<br/>L1d (326)<br/>L11 (326)<br/>L11 (326)<br/>PU (#78)<br/>PU (#79)<br/>PU (#79)<br/>P103<br/>P103<br/>P103<br/>P104<br/>P103<br/>P104<br/>P103<br/>P104<br/>P103<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104</td><td>L3 (1646)<br/>L2 (512K8) [<br/>L16 (12K8) [<br/>L16 (12K8) [<br/>Core L#40<br/>PU L481<br/>PU L481<br/>P</td><td>L2 (312K9) [<br/>L1d (12K9) [<br/>L11 (12K9) [<br/>FV L82] P441<br/>FV L83] [<br/>P411 [<br/>FV L83] [<br/>FV</td><td>L2 (512X8) [<br/>L1 (12X8) [<br/>L1 (12X8) [<br/>FU L843 ]<br/>FU L843 [<br/>FU L843 ]<br/>FU L853 [<br/>FU L853 ]</td><td>2 (51248)<br/>16 (3248)<br/>11 (3248)<br/>10 (148)<br/>11 (3248)<br/>10 (148)<br/>11 (3248)<br/>10 (148)<br/>11 (1248)<br/>10 (148)<br/>10 (148)</td><td>GroupB<br/>NUMNADOLE (#2)<br/>13 (16495)<br/>12 (312K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>Core L#48<br/>PU (#57<br/>P#112<br/>13 (16495)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>Core L#35<br/>PU (#112)<br/>PD5 (#113)<br/>P320<br/>32<br/>7.9<br/>7.9<br/>7.9<br/>7.9</td><td>1 P#3 (6360)<br/>12 (512K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (32K8)<br/>14 (3</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>Core L850<br/>PU (810)<br/>PPU (810)<br/>PPU (810)<br/>I11 (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L858<br/>PU (8117<br/>PPS)<br/>PU (8117<br/>PS)<br/>22 32 PU</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>P011<br/>P011<br/>P011<br/>P111<br/>P111<br/>P111<br/>P111<br/>P11</td><td>13         (1640)           12         (51280)           11         (1280)           11         (1280)           11         (1280)           13         (1640)           12         (51280)           11         (1280)           13         (1640)           12         (51280)           111         (1280)           111         (1280)           111         (1280)           111         (1270)           P0         (#121)           P4124         (1400)</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L#53<br/>PU L#107<br/>P#513<br/>PU L#107<br/>P#117<br/>L11 (32K8)<br/>L11 (32K8)<br/>L11</td><td>L2 (512X8)<br/>L16 (12X8)<br/>L11 (12X8)<br/>Core L#54<br/>PU L#109<br/>PF518<br/>PU L#109<br/>PF118<br/>L12 (512X8)<br/>L14 (12X8)<br/>L14 (12X8)<br/>Core L#62<br/>PU L#128<br/>PU L#12</td><td>L2 (512K8)<br/>L1d (22K8)<br/>L11 (22K8)<br/>Core L#55<br/>PU (#118<br/>P#515<br/>PU (#119)<br/>L2 (512K8)<br/>L1d (22K8)<br/>L1d (22K8)<br/>L1d (22K8)<br/>Core L#63<br/>PU (#122<br/>P#63)<br/>PU (#227)</td></li></ul></td>  
   | <ul> <li>b) L2 (512K0)</li> <li>b) L1d (12K0)</li> <li>b) L11 (12K8)</li> <li>c) L11 (12K8)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>e</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>a</li> <li>a<td>L2 (5126)<br/>L1d (326)<br/>L11 (326)<br/>L11 (326)<br/>PU (#78)<br/>PU (#79)<br/>PU
(#79)<br/>P103<br/>P103<br/>P103<br/>P104<br/>P103<br/>P104<br/>P103<br/>P104<br/>P103<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104<br/>P104</td><td>L3 (1646)<br/>L2 (512K8) [<br/>L16 (12K8) [<br/>L16 (12K8) [<br/>Core L#40<br/>PU L481<br/>PU L481<br/>P</td><td>L2 (312K9) [<br/>L1d (12K9) [<br/>L11 (12K9) [<br/>FV L82] P441<br/>FV L83] [<br/>P411 [<br/>FV L83] [<br/>FV</td><td>L2 (512X8) [<br/>L1 (12X8) [<br/>L1 (12X8) [<br/>FU L843 ]<br/>FU L843 [<br/>FU L843 ]<br/>FU L853 [<br/>FU L853 ]</td><td>2 (51248)<br/>16 (3248)<br/>11 (3248)<br/>10 (148)<br/>11 (3248)<br/>10 (148)<br/>11 (3248)<br/>10 (148)<br/>11 (1248)<br/>10 (148)<br/>10 (148)</td><td>GroupB<br/>NUMNADOLE (#2)<br/>13 (16495)<br/>12 (312K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>Core L#48<br/>PU (#57<br/>P#112<br/>13 (16495)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>L1 (32K8)<br/>Core L#35<br/>PU (#112)<br/>PD5 (#113)<br/>P320<br/>32<br/>7.9<br/>7.9<br/>7.9<br/>7.9</td><td>1 P#3 (6360)<br/>12 (512K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (32K8)<br/>14 (3</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>Core L850<br/>PU (810)<br/>PPU (810)<br/>PPU (810)<br/>I11 (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L858<br/>PU (8117<br/>PPS)<br/>PU (8117<br/>PS)<br/>22 32 PU</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>P011<br/>P011<br/>P011<br/>P111<br/>P111<br/>P111<br/>P111<br/>P11</td><td>13         (1640)           12         (51280)           11         (1280)           11         (1280)           11         (1280)           13         (1640)           12         (51280)           11         (1280)           13         (1640)           12         (51280)           111         (1280)           111         (1280)           111         (1280)           111         (1270)           P0         (#121)           P4124         (1400)</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>Core L#53<br/>PU L#107<br/>P#513<br/>PU L#107<br/>P#117<br/>L11 (32K8)<br/>L11 (32K8)<br/>L11</td><td>L2 (512X8)<br/>L16 (12X8)<br/>L11 (12X8)<br/>Core L#54<br/>PU L#109<br/>PF518<br/>PU L#109<br/>PF118<br/>L12 (512X8)<br/>L14 (12X8)<br/>L14 (12X8)<br/>Core L#62<br/>PU L#128<br/>PU L#12</td><td>L2 (512K8)<br/>L1d (22K8)<br/>L11 (22K8)<br/>Core L#55<br/>PU (#118<br/>P#515<br/>PU (#119)<br/>L2 (512K8)<br/>L1d (22K8)<br/>L1d (22K8)<br/>L1d (22K8)<br/>Core L#63<br/>PU (#122<br/>P#63)<br/>PU (#227)</td></li></ul>   
   | L2 (5126)<br>L1d (326)<br>L11 (326)<br>L11 (326)<br>PU (#78)<br>PU (#79)<br>PU (#79)<br>P103<br>P103<br>P103<br>P104<br>P103<br>P104<br>P103<br>P104<br>P103<br>P104<br>P104<br>P104<br>P104<br>P104<br>P104<br>P104<br>P104   | L3 (1646)<br>L2 (512K8) [<br>L16 (12K8) [<br>L16 (12K8) [<br>Core L#40<br>PU L481<br>PU L481<br>P  | L2 (312K9) [<br>L1d (12K9) [<br>L11 (12K9) [<br>FV L82] P441<br>FV L83] [<br>P411 [<br>FV L83] [<br>FV | L2 (512X8) [<br>L1 (12X8) [<br>L1 (12X8) [<br>FU L843 ]<br>FU L843 [<br>FU L843 ]<br>FU L853 [<br>FU L853 ]   | 2 (51248)<br>16 (3248)<br>11 (3248)<br>10 (148)<br>11 (3248)<br>10 (148)<br>11 (3248)<br>10 (148)<br>11 (1248)<br>10 (148)<br>10 (148)   | GroupB<br>NUMNADOLE (#2)<br>13 (16495)<br>12 (312K8)<br>L1d (32K8)<br>L1d (32K8)<br>Core L#48<br>PU (#57<br>P#112<br>13 (16495)<br>L1 (32K8)<br>L1 (32K8)<br>L1 (32K8)<br>L1 (32K8)<br>L1 (32K8)<br>L1 (32K8)<br>Core L#35<br>PU (#112)<br>PD5 (#113)<br>P320<br>32<br>7.9<br>7.9<br>7.9<br>7.9   
   | 1 P#3 (6360)<br>12 (512K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>12 (512K8)<br>12 (512K8)<br>13 (32K8)<br>14 (3   | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L850<br>PU (810)<br>PPU (810)<br>PPU (810)<br>I11 (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L858<br>PU (8117<br>PPS)<br>PU (8117<br>PS)<br>22 32 PU   | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>P011<br>P011<br>P011<br>P111<br>P111<br>P111<br>P111<br>P11   
   | 13         (1640)           12         (51280)           11         (1280)           11         (1280)           11         (1280)           13         (1640)           12         (51280)           11         (1280)           13         (1640)           12         (51280)           111         (1280)           111         (1280)           111         (1280)           111         (1270)           P0         (#121)           P4124         (1400)  | L2 (512K8)<br>L1d (32K8)<br>L11 (32K8)<br>Core L#53<br>PU L#107<br>P#513<br>PU L#107<br>P#117<br>L11 (32K8)<br>L11   | L2 (512X8)<br>L16 (12X8)<br>L11 (12X8)<br>Core L#54<br>PU L#109<br>PF518<br>PU L#109<br>PF118<br>L12 (512X8)<br>L14 (12X8)<br>L14 (12X8)<br>Core L#62<br>PU L#128<br>PU L#12  | L2 (512K8)<br>L1d (22K8)<br>L11 (22K8)<br>Core L#55<br>PU (#118<br>P#515<br>PU (#119)<br>L2 (512K8)<br>L1d (22K8)<br>L1d (22K8)<br>L1d (22K8)<br>Core L#63<br>PU (#122<br>P#63)<br>PU (#227)   |
| Groupd           NUMMAGE LE2 PR2 (6368)           L2 (5126)         L2 (5126)           L3 (1698)           L4 (1265)         L4 (1266)           L1 (1268)         L1 (1268)           Core L832         Core L834           PU L664         PU L678           PU 1665         PU 1678           PU 1670         PU 1678           PU 1670         L2 (51268)           L3 (15976)         L2 (51268)           L3 (15976)         L2 (51268)         L2 (51288)           L3 (15976)         L1 (1269)         L1 (1269)           L3 (15976)         L1 (1269)         L1 (1269)           L1 (1269)         L1 (1269)         L1 (1269)           PU (481         PU (481           PU (481         PU (481  
   
  | 13         (1649)           12         (31288)         12         (5128)           110         (1288)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         1.0         (328)           111         (328)         2.0         PCI         43:00           2.0         2.0         PCI         43:00         Net ens1           2.0         32         32         32         32         32  
   
   
  | <ul> <li>b) L2 (512K0)</li> <li>b) L1d (22K0)</li> <li>b) L1d (22K0)</li> <li>c) L11 (32K0)</li> <lic) (32k0)<="" l11="" li=""> <lic) (32k0)<="" l11="" li=""> <lic) (32k<="" l11="" td=""><td>L2 (51248)<br/>L1d (1248)<br/>L11 (1248)<br/>Core 1#39<br/>P0 (#78<br/>P73)<br/>P0 (#79<br/>P10)<br/>P1 (#79<br/>P10)<br/>P1 (#79<br/>P10)<br/>P1 (#79<br/>P10)<br/>P1 (#79<br/>P10)</td><td>L3 (1646)<br/>L2 (512K6) [<br/>L16 (32K6) [<br/>L16 (32K6) [<br/>L11 (32K6) [<br/>Core L840<br/>PU L481<br/>PU L481 [<br/>PU L481 ]</td><td>L2 (512K8) [<br/>L1d (12K8) [<br/>L1 (12K8) [<br/>VU L82] P441<br/>VU L83] [<br/>P411 [<br/>VU L83] [<br/>P4105 ]</td><td>L2 (512X8) [<br/>L1d (12X8) [<br/>L11 (12X8) [<br/>FU L843 [<br/>FU</td><td>2 (512%)<br/>16 (32%)<br/>11 (32%)<br/>17 (32%)<br/>19 (487<br/>19 (487<br/>19 (497)<br/>19 (497)<br/>10 (497)</td><td>GroupB<br/>NUMMAde (#2)<br/>12 (512K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L848<br/>PU (#36)<br/>P448<br/>PU (#37)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L856<br/>PU (#11)<br/>PU (#11)<br/>PU (#11)<br/>PU (#12)<br/>PU (</td><td>I P#3 (6360)<br/>L2 (512K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L#49<br/>PU L930<br/>P413<br/>Core L#49<br/>PU L930<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P#57<br/>P</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>Core L#50<br/>PU (#10)<br/>PE10<br/>PU (#101)<br/>L12 (512K8)<br/>L14 (12K8)<br/>L14 (12K8)<br/>L14</td><td>L2 (512K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>L11 (32K8)<br/>P011<br/>P011<br/>P011<br/>P011<br/>P115<br/>L12 (512K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>D14 (32K8)<br/>L14 (32K8)<br/>D14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14
(32K8)<br/>P011<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115<br/>P115</td><td>13         (16(%)           12         (51208)           11         (1208)           11         (1208)           13         (16(%)           14         (1208)           13         (16(%)           14         (1208)           14         (1208)           14         (1208)           14         (1208)           14         (1208)           11         (1208)           19/14         (14/1208)           11         (1208)           19/14         (14/1208)           11         (1208)           19/14         (14/1208)           11         (1208)           12         (1212)           14         (1208)           15         (14/1208)           16         (14/1208)           17         (14/1208)           18         (14/1208)           19/14         (14/1208)</td><td>L2 (512K8)<br/>L16 (32K8)<br/>L11 (32K8)<br/>Core (#53<br/>PU (#107<br/>P#517<br/>PU (#107<br/>P#117<br/>L12 (512K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>L14 (32K8)<br/>DV (#122<br/>P#01<br/>P#125</td><td>L2 (512K8)<br/>L16 (12K8)<br/>L11 (12K8)<br/>Core L#54<br/>P0 (#18)<br/>P54<br/>P0 (#19)<br/>P4118<br/>L2 (512K8)<br/>L14 (12K8)<br/>L14 (12K8)<br/>L14 (12K8)<br/>P0 L#124<br/>P90 L#124<br/>P10 L#</td><td>12 (51208)<br/>11 (2208)<br/>(11 (2208)<br/>Core L#55<br/>PU (#111<br/>P#55<br/>PU (#111<br/>P#15<br/>12 (51208)<br/>11 (1220)<br/>11 (1220)<br/>11 (1220)<br/>PU (#126<br/>PU (#126<br/>PU (#127<br/>P#127)</td></lic)></lic)></lic)></ul>  
   | L2 (51248)<br>L1d (1248)<br>L11 (1248)<br>Core 1#39<br>P0 (#78<br>P73)<br>P0 (#79<br>P10)<br>P1 (#79<br>P10)<br>P1 (#79<br>P10)<br>P1 (#79<br>P10)<br>P1 (#79<br>P10)  | L3 (1646)<br>L2 (512K6) [<br>L16 (32K6) [<br>L16 (32K6) [<br>L11 (32K6) [<br>Core L840<br>PU L481<br>PU L481 [<br>PU L481 ]  | L2 (512K8) [<br>L1d (12K8) [<br>L1 (12K8) [<br>VU L82] P441<br>VU L83] [<br>P411 [<br>VU L83] [<br>P4105 ]   | L2 (512X8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>FU L843 [<br>FU  | 2 (512%)<br>16 (32%)<br>11 (32%)<br>17 (32%)<br>19 (487<br>19 (487<br>19 (497)<br>19 (497)<br>10 (497)   | GroupB<br>NUMMAde (#2)<br>12 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L848<br>PU (#36)<br>P448<br>PU (#37)<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L856<br>PU (#11)<br>PU (#11)<br>PU (#11)<br>PU (#12)<br>PU (  | I P#3 (6360)<br>L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L#49<br>PU L930<br>P413<br>Core L#49<br>PU L930<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core
L#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P#57<br>P | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L#50<br>PU (#10)<br>PE10<br>PU (#101)<br>L12 (512K8)<br>L14 (12K8)<br>L14  | L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>L11 (32K8)<br>P011<br>P011<br>P011<br>P011<br>P115<br>L12 (512K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>D14 (32K8)<br>L14 (32K8)<br>D14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>P011<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115<br>P115   | 13         (16(%)           12         (51208)           11         (1208)           11         (1208)           13         (16(%)           14        
(1208)           13         (16(%)           14         (1208)           14         (1208)           14         (1208)           14         (1208)           14         (1208)           11         (1208)           19/14         (14/1208)           11         (1208)           19/14         (14/1208)           11         (1208)           19/14         (14/1208)           11         (1208)           12         (1212)           14         (1208)           15         (14/1208)           16         (14/1208)           17         (14/1208)           18         (14/1208)           19/14         (14/1208)   | L2 (512K8)<br>L16 (32K8)<br>L11 (32K8)<br>Core (#53<br>PU (#107<br>P#517<br>PU (#107<br>P#117<br>L12 (512K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>L14 (32K8)<br>DV (#122<br>P#01<br>P#125  | L2 (512K8)<br>L16 (12K8)<br>L11 (12K8)<br>Core L#54<br>P0 (#18)<br>P54<br>P0 (#19)<br>P4118<br>L2 (512K8)<br>L14 (12K8)<br>L14 (12K8)<br>L14 (12K8)<br>P0 L#124<br>P90 L#124<br>P10 L#  | 12 (51208)<br>11 (2208)<br>(11 (2208)<br>Core L#55<br>PU (#111<br>P#55<br>PU (#111<br>P#15<br>12 (51208)<br>11 (1220)<br>11 (1220)<br>11 (1220)<br>PU (#126<br>PU (#126<br>PU (#127<br>P#127)  |
| Groupd           NUMMAGE L82 P82 (6368)           L3 (1698)           L2 (5126)         L2 (51269)           L4 (120)         L16 (120)           L16 (120)         L16 (120)           L11 (120)         L16 (120)           L11 (120)         L11 (120)           L1 (120)         L1 (120)           L2 (5120)         L2 (5120)           L3 (1509)         L2 (5120)           L3 (1509)         L2 (5120)           L3 (1509)         L2 (5120)           L3 (1509)         L3 (1509)           L3 (1509)         L3 (1200)           L4 (1200)         L4 (1200)           L4 (1200)         L4 (1200)           L14 (1200)         L11 (1200) </td <td>3 (1649)         12 (5128)       12 (512)         11d (1228)       11 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         112 (117)       Pular         P1400       Pular         P1401       Pular         <t< td=""><td><ul> <li>b) L2 (512K8)</li> <li>b) L1d (32K8)</li> <li>c) L1d (32K8)</li> <li>c) L11 (32K8)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>P L47</li></ul></td><td>L2 (5126)<br/>L1d (1260)<br/>L11 (1260)<br/>Core L839<br/>PD (1878<br/>PP3)<br/>PD (1879<br/>PF103)</td><td>L3 (1649)<br/>L2 (512K8) [<br/>L16 (12K8) [<br/>L11 (12K8) [<br/>Core L#66<br/>PU L080 [<br/>PU L080 ]<br/>PU L081 [<br/>PU L081 ]</td><td>L2 (512K8) [<br/>L1d (32K8) [<br/>L1d (32K8) [<br/>L11 (32K8) [<br/>P#41]<br/>Py L483 [<br/>Py L483 ]<br/>Py 105 [<br/>L11 (32K8) [<br/>L11 (32K8) [<br/>P41]<br/>Py 105 [<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>L11 (32K8) [<br/>L</td><td>L2 (512X8) [<br/>L16 (12X8) [<br/>L17 (12X8) [<br/>Core L#42<br/>PU L#85<br/>P#42<br/>PU L#85<br/>P#106</td><td>2 (51248)<br/>14 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>12 (3124)<br/>12 (3124)</td><td>Group8<br/>NUMMAde (#2)<br/>(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)</td><td>1 P#3 (6368)<br/>12 (512K8)<br/>11 (12K8)<br/>11 (12K8)<br/>Core L#49<br/>PU (#38)<br/>P413<br/>12 (512K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (22K8)<br/>14 (32K8)<br/>14 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>PU (#314<br/>P#13<br/>P1 (#314)<br/>P1 (#314)<br/>P2 (32K8)<br/>P1 (#314)<br/>P2 (32K8)<br/>P1 (#314)<br/>P1 (#</td><td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#50<br/>P90 (#10)<br/>P91 (#10)<br/>P9114<br/>L12 (512X8)<br/>L14 (12X8)<br/>Core L#51<br/>P9 (#117<br/>P9142116<br/>P958<br/>P0 (#117<br/>P1222<br/>J2 J2 J2 P<br/>L1</td><td>[12 (51288)<br/>[11 (1288)<br/>[11 (1288)<br/>[11 (1288)<br/>[10 (1289)<br/>[11 (1289)</td><td>13         (164%)           12         (51208)           11         (1208)           11         (1208)           11         (1208)           12         (51208)           11         (1208)           12         (51208)           111         (208)           111         (208)           111         (208)           111         (208)           111         (208)           11         (208)           11         (208)           11         (208)           11         (208)           12         (1140)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           16</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L1 (12K8)<br/>Core L#53<br/>PU L#106<br/>P#53<br/>PU L#107<br/>P#117<br/>L1 (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L#52<br/>P#125</td><td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#54<br/>P0 L 8189<br/>P514<br/>P0 L 8189<br/>P514<br/>L11 (12X8)<br/>L14 (12X8)<br/>L14 (12X8)<br/>Core L#52<br/>P0 L 8124<br/>P0 L 8124<br/>P0 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L</td><td>12 (512K8)<br/>11 (22K8)<br/>(11 (22K8)<br/>Core L#55<br/>PU (#118)<br/>PD (#111<br/>PD (#125<br/>L14 (22K8)<br/>Core L#52<br/>PU (#127<br/>PU (#127<br/>PU (#127)<br/>PU (#17)<br/>PU (#17)<br/>P</td></t<></td>   | 3 (1649)         12 (5128)       12 (512)         11d (1228)       11 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         111 (128)       111 (128)         112 (117)       Pular         P1400       Pular         P1401       Pular <t< td=""><td><ul> <li>b) L2 (512K8)</li> <li>b) L1d (32K8)</li> <li>c) L1d (32K8)</li> <li>c) L11 (32K8)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>P L47</li></ul></td><td>L2 (5126)<br/>L1d (1260)<br/>L11 (1260)<br/>Core L839<br/>PD (1878<br/>PP3)<br/>PD (1879<br/>PF103)</td><td>L3 (1649)<br/>L2 (512K8) [<br/>L16 (12K8) [<br/>L11 (12K8) [<br/>Core L#66<br/>PU L080 [<br/>PU L080 ]<br/>PU L081 [<br/>PU L081 ]</td><td>L2 (512K8) [<br/>L1d (32K8) [<br/>L1d (32K8) [<br/>L11 (32K8) [<br/>P#41]<br/>Py L483 [<br/>Py L483 ]<br/>Py 105 [<br/>L11 (32K8) [<br/>L11 (32K8) [<br/>P41]<br/>Py 105 [<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>Py 105 ]<br/>L11 (32K8) [<br/>L11 (32K8) [<br/>L</td><td>L2 (512X8) [<br/>L16 (12X8) [<br/>L17 (12X8) [<br/>Core L#42<br/>PU L#85<br/>P#42<br/>PU L#85<br/>P#106</td><td>2 (51248)<br/>14 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>12 (3124)<br/>12 (3124)</td><td>Group8<br/>NUMMAde (#2)<br/>(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)</td><td>1 P#3 (6368)<br/>12 (512K8)<br/>11 (12K8)<br/>11 (12K8)<br/>Core L#49<br/>PU (#38)<br/>P413<br/>12 (512K8)<br/>12 (512K8)<br/>12 (512K8)<br/>13 (22K8)<br/>14 (32K8)<br/>14 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>PU (#314<br/>P#13<br/>P1 (#314)<br/>P1 (#314)<br/>P2 (32K8)<br/>P1 (#314)<br/>P2 (32K8)<br/>P1 (#314)<br/>P1 (#</td><td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#50<br/>P90 (#10)<br/>P91 (#10)<br/>P9114<br/>L12 (512X8)<br/>L14 (12X8)<br/>Core L#51<br/>P9 (#117<br/>P9142116<br/>P958<br/>P0 (#117<br/>P1222<br/>J2 J2 J2 P<br/>L1</td><td>[12 (51288)<br/>[11 (1288)<br/>[11 (1288)<br/>[11 (1288)<br/>[10 (1289)<br/>[11 (1289)</td><td>13         (164%)           12         (51208)           11         (1208)           11         (1208)           11         (1208)           12         (51208)           11    
    (1208)           12         (51208)           111         (208)           111         (208)           111         (208)           111         (208)           111         (208)           11         (208)           11         (208)           11         (208)           11         (208)           12         (1140)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           16</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L1 (12K8)<br/>Core L#53<br/>PU L#106<br/>P#53<br/>PU L#107<br/>P#117<br/>L1 (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L#52<br/>P#125</td><td>L2 (512X8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#54<br/>P0 L 8189<br/>P514<br/>P0 L 8189<br/>P514<br/>L11 (12X8)<br/>L14 (12X8)<br/>L14 (12X8)<br/>Core L#52<br/>P0 L 8124<br/>P0 L 8124<br/>P0 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L 8124<br/>P1 L 8129<br/>P1 L 8124<br/>P1 L</td><td>12 (512K8)<br/>11 (22K8)<br/>(11 (22K8)<br/>Core L#55<br/>PU (#118)<br/>PD (#111<br/>PD (#125<br/>L14 (22K8)<br/>Core L#52<br/>PU (#127<br/>PU (#127<br/>PU (#127)<br/>PU (#17)<br/>PU (#17)<br/>P</td></t<>  
  | <ul> <li>b) L2 (512K8)</li> <li>b) L1d (32K8)</li> <li>c) L1d (32K8)</li> <li>c) L11 (32K8)</li> <li>P L476</li> <li>P L476</li> <li>P L477</li> <li>P L47</li></ul>   
   
  | L2 (5126)<br>L1d (1260)<br>L11 (1260)<br>Core L839<br>PD (1878<br>PP3)<br>PD (1879<br>PF103)   
   | L3 (1649)<br>L2 (512K8) [<br>L16 (12K8) [<br>L11 (12K8) [<br>Core L#66<br>PU L080 [<br>PU L080 ]<br>PU L081 [<br>PU L081 ]   | L2 (512K8) [<br>L1d (32K8) [<br>L1d (32K8) [<br>L11 (32K8) [<br>P#41]<br>Py L483 [<br>Py L483 ]<br>Py 105 [<br>L11 (32K8) [<br>L11 (32K8) [<br>P41]<br>Py 105 [<br>L11 (32K8) [<br>Py 105 ]<br>L11 (32K8) [<br>Py 105 ]<br>L11 (32K8) [<br>Py 105 ]<br>L11 (32K8) [<br>L11 (32K8) [<br>L   | L2 (512X8) [<br>L16 (12X8) [<br>L17 (12X8) [<br>Core L#42<br>PU L#85<br>P#42<br>PU L#85<br>P#106  | 2 (51248)<br>14 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>12 (3124)<br>12 (3124)   | Group8<br>NUMMAde (#2)<br>(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)   
   | 1 P#3 (6368)<br>12 (512K8)<br>11 (12K8)<br>11 (12K8)<br>Core L#49<br>PU (#38)<br>P413<br>12 (512K8)<br>12 (512K8)<br>12 (512K8)<br>13 (22K8)<br>14 (32K8)<br>14 (32K8)<br>11 (32K8)<br>11 (32K8)<br>PU (#314<br>P#13<br>P1 (#314)<br>P1 (#314)<br>P2 (32K8)<br>P1 (#314)<br>P2 (32K8)<br>P1 (#314)<br>P1 (#   | L2 (512X8)<br>L1d (12X8)<br>L11 (12X8)<br>Core L#50<br>P90 (#10)<br>P91 (#10)<br>P9114<br>L12 (512X8)<br>L14 (12X8)<br>Core L#51<br>P9 (#117<br>P9142116<br>P958<br>P0 (#117<br>P1222<br>J2 J2 J2 P<br>L1   | [12 (51288)<br>[11 (1288)<br>[11 (1288)<br>[11 (1288)<br>[10 (1289)<br>[11 (1289)   | 13         (164%)           12         (51208)           11         (1208)           11         (1208)           11         (1208)           12         (51208)           11         (1208)           12         (51208)           111         (208)           111         (208)           111         (208)           111         (208)           111         (208)           11         (208)           11         (208)           11         (208)           11         (208)           12         (1140)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (208)           12         (51208)           13         (1640)           14         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           14         (2100)           15         (2100)           16   
  | L2 (512K8)<br>L1d (12K8)<br>L1 (12K8)<br>Core L#53<br>PU L#106<br>P#53<br>PU L#107<br>P#117<br>L1 (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L#52<br>P#125   | L2 (512X8)<br>L1d (12X8)<br>L11 (12X8)<br>Core L#54<br>P0 L 8189<br>P514<br>P0 L 8189<br>P514<br>L11 (12X8)<br>L14 (12X8)<br>L14 (12X8)<br>Core L#52<br>P0 L 8124<br>P0 L 8124<br>P0 L 8129<br>P1 L 8124<br>P1 L 8129<br>P1 L 8124<br>P1 L 8129<br>P1 L 8124<br>P1 L 8129<br>P1 L 8124<br>P1 L 8124<br>P1 L 8129<br>P1 L 8124<br>P1 L  | 12 (512K8)<br>11 (22K8)<br>(11 (22K8)<br>Core L#55<br>PU (#118)<br>PD (#111<br>PD (#125<br>L14 (22K8)<br>Core L#52<br>PU (#127<br>PU (#127<br>PU (#127)<br>PU (#17)<br>PU (#17)<br>P                                 |
| Groupd           NUMMose L2 #82 (6368)           13 (1095)           12 (5120)         12 (5120)           14 (1205)         116 (1206)           116 (1206)         116 (1206)           111 (1205)         111 (1205)           111 (1205)         111 (1206)           111 (1205)         111 (1206)           111 (1206)         111 (1207)           111 (1207)         111 (1207)           111 (1208)         111 (1207)           111 (1208)         111 (1207)           111 (1208)         111 (1207)           12 (51208)         12 (51208)           13 (16090         12 (51208)           14 (1208)         111 (1207)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1208)         111 (1208)           111 (1108)         111 (1108)           111 (1108)         111 (1108)           111 (1   
   
  | L1 (1649)<br>L2 (5128) L2 (5128)<br>L1d (1285) L1d (128<br>L1d (1286) L1d (128<br>PU (47)<br>PU (43)<br>PU (43)<br>P   
   
   
  | <ul> <li>b) L2 (512K0)</li> <li>b) L1d (12K0)</li> <li>c) L1d (12K0)</li> <li>c) L11 (12K0)</li> <lic) (12k0)<="" l11="" li=""> <lic) (12k0)<="" l11="" li=""> <lic) (12k<="" l11="" td=""><td>L2 (51248)<br/>L1d (3248)<br/>L11 (3248)<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479<br/>Pu (479)<br/>Pu (479)<br/>Pu (479)<br/>Pu (479)<br/>Pu (48)<br/>Pu (48)<br/>P</td><td>L3 (1649)<br/>L2 (5128)<br/>L1 (128)<br/>L1 (128)<br/>Core L#40<br/>P9 L83<br/>P1 04</td><td>L2 (512K8) [<br/>L1d (32K8) [<br/>L1d (32K8) [<br/>L11 (32K8) [<br/>P#41]<br/>PU L83]<br/>P105 [<br/>P105]</td><td>L2 (512X8) [<br/>L1d (12X8) [<br/>L11 (12X8) [<br/>COPE L#42<br/>PU L#85<br/>P#42<br/>PU L#85<br/>P#106</td><td>2 (512%)<br/>14 (32%)<br/>11 (32%)<br/>60°C 1443<br/>FU (487)<br/>FU (4</td><td>Group0<br/>NUMINADE LE2<br/>(1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2</td><td>1 P#3 (6368)<br/>12 (512K8)<br/>11 (12K8)<br/>11 (12K8)<br/>Core L#49<br/>PU L899<br/>P413<br/>12 (512K8)<br/>11 (12K8)<br/>12 (512K8)<br/>13 (12K8)<br/>14 (12K8)<br/>Core L#57<br/>PU L814<br/>P57<br/>PU L814<br/>P57<br/>PU L814<br/>P57<br/>PU L814<br/>P10 (5189)<br/>0 (10 (10 (10 (10 (10 (10 (10 (10 (10 (1</td><td>L2 (512K8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>Core L#50<br/>PU (#10)<br/>PU (#10)<br/>PU (#10)<br/>PU (#10)<br/>PU (#11)<br/>L11 (12X8)<br/>Core L#56<br/>PU (#117<br/>PU (#117<br/>PU (#117)<br/>PU (#17)<br/>PU (#17)<br/>PU</td><td>L2 (51248)<br/>L1d (3248)<br/>L11 (3248)<br/>P015<br/>P015<br/>P115<br/>L2 (51248)<br/>L11 (3248)<br/>L11 (3248)<br/>L11 (3248)<br/>Core L028)<br/>Core L0289<br/>P015<br/>P105<br/>P105<br/>P105<br/>P105<br/>P105<br/>P105<br/>P105</td><td>13         (16%)           12         (51208)           11         (1208)           11         (2208)           11         (1208)           12         (51208)           14         (2208)           13         (16%)           12         (51208)           14         (2208)           14         (2208)           111         (2208)           PU L8120         P460           PU L8120         P461           P4124</td><td>L2 (512K8)<br/>L1d (22K8)<br/>L1 (22K8)<br/>Core L#33<br/>PU (#106)<br/>P#53<br/>PU (#107<br/>P#117<br/>L2 (512K8)<br/>L1d (32K8)<br/>L1d (32K8)<br/>Core L#61<br/>PU (#122<br/>P#61<br/>PU (#122<br/>P#125</td><td>12 (512X8)<br/>11 (22X8)<br/>11 (22X8)<br/>Core L#54<br/>P0 (4109<br/>P514<br/>P0 (4109<br/>P514<br/>P0 (4109<br/>P514<br/>P0 (4109<br/>P0 (4109<br/>P0 (4102<br/>P0 (410)<br/>P0 (410)<br/>P0 (410)<br/>P0 (410)<br/>P0 (410)<br/>P0</td><td>L2 (512K8)<br/>L1d (12K8)<br/>(L1 (12K8)<br/>PU (#118)<br/>PU (#118)<br/>PU (#117)<br/>L2 (512K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core (#63)<br/>PU (#127)</td></lic)></lic)></lic)></ul>  
  | L2 (51248)<br>L1d (3248)<br>L11 (3248)<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479<br>Pu (479)<br>Pu (479)<br>Pu (479)<br>Pu (479)<br>Pu (48)<br>Pu (48)<br>P | L3 (1649)<br>L2 (5128)<br>L1 (128)<br>L1 (128)<br>Core L#40<br>P9 L83<br>P1 04   
   | L2 (512K8) [<br>L1d (32K8) [<br>L1d (32K8) [<br>L11 (32K8) [<br>P#41]<br>PU L83]<br>P105 [<br>P105]  | L2 (512X8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>COPE L#42<br>PU L#85<br>P#42<br>PU L#85<br>P#106  | 2 (512%)<br>14 (32%)<br>11 (32%)<br>60°C 1443<br>FU (487)<br>FU (4   | Group0<br>NUMINADE LE2<br>(1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2  
   | 1 P#3 (6368)<br>12 (512K8)<br>11 (12K8)<br>11 (12K8)<br>Core L#49<br>PU L899<br>P413<br>12 (512K8)<br>11 (12K8)<br>12 (512K8)<br>13 (12K8)<br>14 (12K8)<br>Core L#57<br>PU L814<br>P57<br>PU L814<br>P57<br>PU L814<br>P57<br>PU L814<br>P10 (5189)<br>0 (10 (10 (10 (10 (10 (10 (10 (10 (10 (1  | L2 (512K8)<br>L1d (12X8)<br>L11 (12X8)<br>Core L#50<br>PU (#10)<br>PU (#10)<br>PU (#10)<br>PU (#10)<br>PU (#11)<br>L11 (12X8)<br>Core L#56<br>PU (#117<br>PU (#117<br>PU (#117)<br>PU (#17)<br>PU  | L2 (51248)<br>L1d (3248)<br>L11 (3248)<br>P015<br>P015<br>P115<br>L2 (51248)<br>L11 (3248)<br>L11 (3248)<br>L11 (3248)<br>Core L028)<br>Core L0289<br>P015<br>P105<br>P105<br>P105<br>P105<br>P105<br>P105<br>P105  
   | 13         (16%)           12         (51208)           11         (1208)           11         (2208)           11         (1208)           12         (51208)           14         (2208)           13         (16%)           12         (51208)           14         (2208)           14         (2208)           111         (2208)           PU L8120         P460           PU L8120         P461           P4124  | L2 (512K8)<br>L1d (22K8)<br>L1 (22K8)<br>Core L#33<br>PU (#106)<br>P#53<br>PU (#107<br>P#117<br>L2 (512K8)<br>L1d (32K8)<br>L1d (32K8)<br>Core L#61<br>PU (#122<br>P#61<br>PU (#122<br>P#125   | 12 (512X8)<br>11 (22X8)<br>11 (22X8)<br>Core L#54<br>P0 (4109<br>P514<br>P0 (4109<br>P514<br>P0 (4109<br>P514<br>P0 (4109<br>P0 (4109<br>P0 (4102<br>P0 (410)<br>P0 (410)<br>P0 (410)<br>P0 (410)<br>P0 (410)<br>P0   | L2 (512K8)<br>L1d (12K8)<br>(L1 (12K8)<br>PU (#118)<br>PU (#118)<br>PU (#117)<br>L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core (#63)<br>PU (#127)   |
| Groupd           NUMMode L42 P42 (6368)           L3 (1098)           L2 (51248)         L2 (51248)           L3 (1098)           L2 (51248)         L2 (51248)           L14 (3228)         L16 (3228)           L14 (3228)         L14 (3228)           L14 (3280)         L11 (3280)           L11 (3280)         L11 (3280)           Core L832         Core L834           PU L656         P023           PU L650         P024           PU L650         L2 (51208)           L3 (1098)         L2 (51208)           L3 (1018)         L2 (51208)           L3 (1020)         L16 (3220)           L3 (1020)         L16 (3220)           L3 (1020)         L3 (3220)           L3 (1020)         L3 (3220)           L3 (1020)         L3 (3220)           L3 (3220)         L3 (3220)           L3  
   
  | L3 (1640)<br>L2 (512K8) L2 (512K<br>L1d (72K8) L1d (72K<br>L1d (72K8) L1d (72K<br>PU L972<br>PU L972<br>PU L973<br>PU L973<br>P  
   
   
   | <ul> <li>b) [12 (512K6)]</li> <li>b) [11 (32K6)]</li> <li>c) [11 (32K6)]</li> <li>c) [12 (32K6)]</li> <li>p (127)</li> <li>p (127)<!--</td--><td>L2 (51248)<br/>L1d (3228)<br/>L1d (3228)<br/>L11 (3228)<br/>PU (878<br/>PU (878<br/>PU (879<br/>PU (879<br/>PU (879<br/>Pu (879<br/>Pu (879<br/>Pu (879)<br/>Pu (879)<br/>Pu (879)<br/>Pu (879)</td><td>L3 (1946)<br/>L2 (51260)<br/>L1 (51260)<br/>L1 (1220)<br/>COTE L460<br/>PU L481<br/>PU L481</td><td>L2 (512K8) [<br/>L1d (12K8) [<br/>L11 (12K8) [<br/>PU L82]<br/>PU L82]<br/>PU L83<br/>P2105</td><td>L2 (512K8) [<br/>L16 (12K8) [<br/>L11 (12K8) [<br/>COPE LEM2]<br/>PU LEM3<br/>PU LEM3<br/>PU</td><td>2 (51248)<br/>14 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>11 (3248)<br/>12 (1247)<br/>14 (1247)</td><td>Group8<br/>RUMANGGE (E2<br/>13 (1649)<br/>12 (512K8)<br/>111 (32K8)<br/>111 (32K8)<br/>111 (32K8)<br/>111 (32K8)<br/>112 (512K8)<br/>121 (312K8)<br/>121 (312K8)<br/>121</td><td>P#3 (6366)           L2 (512K8)           L1d (32K8)           L1d (32K8)           L11 (32K8)           PU L#98           PU L#98           PU L#98           PU L#98           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           D1d (32K8)           D2 (32K8)           D1d (32K8)           D2 (32K8)           D1 (32K8)           D2 (32K8)           D2 (32K8)           D2 (32K8)           D2 (32K8)</td><td>L2 (512K8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>L11 (12X8)<br/>PU (4100<br/>P950<br/>PU (4100<br/>P950<br/>PU (4100<br/>P1 (4100<br/>P1 (4100<br/>P250<br/>L11 (12X8)<br/>L1d (12X8)<br/>Core (4358<br/>PU (4117)<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412<br/>P412</td><td>L2 (312K8)<br/>L1d (12X8)<br/>L11 (12X8)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>PU (302<br/>PS1)<br/>L11 (12X8)<br/>L11 (12X</td><td>L3 (1649)<br/>L2 (512K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>Core L852<br/>PU L8154<br/>PF116<br/>L2 (512K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>L1d (12K8)<br/>Core L850<br/>PF124<br/>PU L8120<br/>PF0 L8121<br/>PF124</td><td>L2 (51288)<br/>L1d (3288)<br/>L11 (3288)<br/>L11 (3288)<br/>PU L8106<br/>PP33<br/>PU L8107<br/>PU L8107</td><td>L2 (51289)<br/>L1d (1288)<br/>L11 (1288)<br/>Core LES4<br/>PU Let09<br/>P254<br/>PU Let09<br/>P254<br/>L1d (1289)<br/>L1d (1289)<br/>L1d (1289)<br/>Core LE52<br/>PU Let24<br/>P422<br/>PU Let25<br/>P4126</td><td>L2 (51200)<br/>L1d (3200)<br/>L1d (3200)<br/>Core L855<br/>PU L8110<br/>PPU L8110<br/>PPU L8110<br/>PU L8110<br/>PU L8120<br/>L1d (3200)<br/>L1d (3200)<br/>L1d (3200)<br/>L1d (3200)<br/>Core L863<br/>PU L8127<br/>PU L8127<br/>PU L8127</td></li></ul>   
   | L2 (51248)<br>L1d (3228)<br>L1d (3228)<br>L11 (3228)<br>PU (878<br>PU (878<br>PU (879<br>PU (879<br>PU (879<br>Pu (879<br>Pu (879<br>Pu (879)<br>Pu (879)<br>Pu (879)<br>Pu (879)  | L3 (1946)<br>L2 (51260)<br>L1 (51260)<br>L1 (1220)<br>COTE L460<br>PU L481<br>PU L481   | L2 (512K8) [<br>L1d (12K8) [<br>L11 (12K8) [<br>PU L82]<br>PU L82]<br>PU L83<br>P2105  | L2 (512K8) [<br>L16 (12K8) [<br>L11 (12K8) [<br>COPE LEM2]<br>PU LEM3<br>PU | 2 (51248)<br>14 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>11 (3248)<br>12 (1247)<br>14 (1247)   | Group8<br>RUMANGGE (E2<br>13 (1649)<br>12 (512K8)<br>111 (32K8)<br>111 (32K8)<br>111 (32K8)<br>111 (32K8)<br>112 (512K8)<br>121 (312K8)<br>121  | P#3 (6366)           L2 (512K8)           L1d (32K8)           L1d (32K8)           L11 (32K8)           PU L#98           PU L#98           PU L#98           PU L#98          
L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           L1d (32K8)           D1d (32K8)           D2 (32K8)           D1d (32K8)           D2 (32K8)           D1 (32K8)           D2 (32K8)           D2 (32K8)           D2 (32K8)           D2 (32K8)   | L2 (512K8)<br>L1d (12X8)<br>L11 (12X8)<br>L11 (12X8)<br>PU (4100<br>P950<br>PU (4100<br>P950<br>PU (4100<br>P1 (4100<br>P1 (4100<br>P250<br>L11 (12X8)<br>L1d (12X8)<br>Core (4358<br>PU (4117)<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412<br>P412 | L2 (312K8)<br>L1d (12X8)<br>L11 (12X8)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>PU (302<br>PS1)<br>L11 (12X8)<br>L11 (12X   | L3 (1649)<br>L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L852<br>PU L8154<br>PF116<br>L2 (512K8)<br>L1d (12K8)<br>L1d (12K8)<br>L1d (12K8)<br>Core L850<br>PF124<br>PU L8120<br>PF0 L8121<br>PF124  
   | L2 (51288)<br>L1d (3288)<br>L11 (3288)<br>L11 (3288)<br>PU L8106<br>PP33<br>PU L8107<br>PU L8107 | L2 (51289)<br>L1d (1288)<br>L11 (1288)<br>Core LES4<br>PU Let09<br>P254<br>PU Let09<br>P254<br>L1d (1289)<br>L1d (1289)<br>L1d (1289)<br>Core LE52<br>PU Let24<br>P422<br>PU Let25<br>P4126   | L2 (51200)<br>L1d (3200)<br>L1d (3200)<br>Core L855<br>PU L8110<br>PPU L8110<br>PPU L8110<br>PU L8110<br>PU L8120<br>L1d (3200)<br>L1d (3200)<br>L1d (3200)<br>L1d (3200)<br>Core L863<br>PU L8127<br>PU L8127<br>PU L8127   |
| Groupd           NUMMAGE LE2 PE2 (6368)           L3 (1698)           L2 (3126)         L2 (31260)           L3 (1698)           L4 (3260)         L3 (31260)           L1 (3260)         L1 (3260)           L1 (3260)         L2 (31260)           PU (456)         PP47           PU (457)         PP40           P957         P977           P970         P970           L2 (31260)         L2 (31260)           L3 (1989)         L1 (3260)           L1 (3260)         L1 (  
   
  | 13       (1640)         12       (51208)       12         141       (3280)       14         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         141       (3280)       11         142       (143)       (143)         12.0       2.0       PCI         2.0       PCI       43:00         12.0       32       32       32         32       32       32       32   
   
   
  | <ul> <li>a) L2 (512KB)</li> <li>b) L1d (32KB)</li> <li>c) L11 (32KB)</li> <lic) (32kb)<="" l11="" li=""> <lic) (32kb)<="" l11="" li=""> <lic) (32k<="" l11="" td=""><td>L2 (51268)<br/>L1d (3268)<br/>L1d (3268)<br/>L11 (3268)<br/>PU (478)<br/>PU (478)<br/>PU (478)<br/>PU (479)<br/>P1(33)<br/>P1 (48)<br/>P1 (48)</td><td>L3 (1246)<br/>L2 (51268)<br/>L3 (1257)<br/>L11 (12769)<br/>Core L440<br/>PU L481<br/>P1 L481</td><td>L2 (512K8) [<br/>L1d (12X8) [<br/>L11 (12X8) [<br/>TV 1822 ]<br/>P441<br/>PU 1883 [<br/>P415]</td><td>L2 (512K8) [<br/>L10 (12K8) [<br/>L11 (12K8) [<br/>Core L#42  <br/>FU L#85  </td><td>2 (51288)<br/>14 (3288)<br/>11 (3288)<br/>50re L#3<br/>PU L#87<br/>PU L#87<br/>PUL#87<br/>PJ107</td><td>Group8<br/>RUMMAdde (#2)<br/>13 (1649)<br/>12 (512K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>11 (32K8)<br/>13 (1649)<br/>12 (512K8)<br/>14 (32K8)<br/>14 (32K8</td><td>P#3 (6366)     L2 (512K8)     L1d (32K8)     L1d (32K8)     L11 (32K8)     PU L898     PU L898     PU L898     PU L898     L1d (32K8)     L1d (32K8)</td><td>L2 (512K8)<br/>L1d (12K8)<br/>L11 (12K8)<br/>Core L850<br/>PU L8100<br/>PU L8101<br/>PU L8101<br/>L12 (512K8)<br/>L14 (12K8)<br/>Core L858<br/>PU L8116<br/>PD L8116<br/>PD L8117<br/>PB L92<br/>PD L817<br/>PD L8</td><td>L2 (31248)<br/>L1d (1248)<br/>L11 (1248)<br/>Core L851<br/>PU (110)<br/>P011<br/>P011<br/>P011<br/>P011<br/>P011<br/>P011<br/>L11 (1248)<br/>L11 (1</td><td>3 (16%)<br/>12 (5128)<br/>11 (1288)<br/>11 (1288)<br/>01 (1288)<br/>01 (1288)<br/>01 (1288)<br/>01 (1288)<br/>01 (1288)<br/>13 (16%)<br/>12 (5128)<br/>14 (1288)<br/>14 (1288)<br/>01 (1288)<br/>01</td><td>12 (51288)<br/>11d (1288)<br/>111 (1288)<br/>Core L#33<br/>PU L#106<br/>P433<br/>PU L#107<br/>PU L#107<br/>P1 L#107<br/>P411<br/>Core L#61<br/>PU L#122<br/>P661<br/>PU L#122<br/>P612<br/>P1 L#123<br/>P1 L#123<br/>P1 L#124<br/>P1 L#127<br/>P1 L</td><td>L2 (51289)<br/>L1d (1289)<br/>L11 (1289)<br/>Core L854<br/>PU L8109<br/>P254<br/>L12 (51289)<br/>L12 (51289)<br/>L14 (1289)<br/>L14 (1289)<br/>Core L862<br/>PU L8129<br/>P402<br/>PU L8125<br/>P4025</td><td>12 (51208)<br/>14 (12205)<br/>11 (12205)<br/>11 (12205)<br/>20 (4110)<br/>P9 (4110)<br/>P9 (4110)<br/>P9 (4110)<br/>21 (51208)<br/>11 (12205)<br/>11 (12205)<br/>11 (12205)<br/>11 (12205)<br/>11 (12205)<br/>11 (12205)<br/>11 (12205)<br/>12 (51205)<br/>12 (51205)</td></lic)></lic)></lic)></ul> | L2 (51268)<br>L1d (3268)<br>L1d (3268)<br>L11 (3268)<br>PU (478)<br>PU (478)<br>PU (478)<br>PU (479)<br>P1(33)<br>P1 (48)<br>P1 (48)    | L3 (1246)<br>L2 (51268)<br>L3 (1257)<br>L11 (12769)<br>Core L440<br>PU L481<br>P1 L481  | L2 (512K8) [<br>L1d (12X8) [<br>L11 (12X8) [<br>TV 1822 ]<br>P441<br>PU 1883 [<br>P415]  | L2 (512K8) [<br>L10 (12K8) [<br>L11 (12K8) [<br>Core L#42  <br>FU L#85  | 2 (51288)<br>14 (3288)<br>11 (3288)<br>50re L#3<br>PU L#87<br>PU L#87<br>PUL#87<br>PJ107  
  | Group8<br>RUMMAdde (#2)<br>13 (1649)<br>12 (512K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>11 (32K8)<br>13 (1649)<br>12 (512K8)<br>14 (32K8)<br>14 (32K8  | P#3 (6366)     L2 (512K8)     L1d (32K8)     L1d (32K8)     L11 (32K8)     PU L898     PU L898     PU L898     PU L898     L1d (32K8)   | L2 (512K8)<br>L1d (12K8)<br>L11 (12K8)<br>Core L850<br>PU L8100<br>PU L8101<br>PU L8101<br>L12 (512K8)<br>L14 (12K8)<br>Core L858<br>PU L8116<br>PD L8116<br>PD L8117<br>PB L92<br>PD L817<br>PD L8  | L2 (31248)<br>L1d (1248)<br>L11 (1248)<br>Core L851<br>PU (110)<br>P011<br>P011<br>P011<br>P011<br>P011<br>P011<br>L11 (1248)<br>L11 (1   | 3 (16%)<br>12 (5128)<br>11 (1288)<br>11 (1288)<br>01 (1288)<br>01 (1288)<br>01 (1288)<br>01 (1288)<br>01 (1288)<br>13 (16%)<br>12 (5128)<br>14 (1288)<br>14 (1288)<br>01                                  | 12 (51288)<br>11d (1288)<br>111 (1288)<br>Core L#33<br>PU L#106<br>P433<br>PU L#107<br>PU L#107<br>P1 L#107<br>P411<br>Core L#61<br>PU L#122<br>P661<br>PU L#122<br>P612<br>P1 L#123<br>P1 L#123<br>P1 L#124<br>P1 L#127<br>P1 L   | L2 (51289)<br>L1d (1289)<br>L11 (1289)<br>Core L854<br>PU L8109<br>P254<br>L12 (51289)<br>L12 (51289)<br>L14 (1289)<br>L14 (1289)<br>Core L862<br>PU L8129<br>P402<br>PU L8125<br>P4025  
  | 12 (51208)<br>14 (12205)<br>11 (12205)<br>11 (12205)<br>20 (4110)<br>P9 (4110)<br>P9 (4110)<br>P9 (4110)<br>21 (51208)<br>11 (12205)<br>11 (12205)<br>11 (12205)<br>11 (12205)<br>11 (12205)<br>11 (12205)<br>11 (12205)<br>12 (51205)<br>12 (51205)   |



### Helpful Resources

**Spock Quick-Start Guide:** <u>https://docs.olcf.ornl.gov/systems/spock\_quick\_start\_guide.html</u>

• Make sure to look at the Known Issues section if you encounter problems.

**Spock Mailing List:** All Spock users are included on a mailing list where OLCF will communicate about downtimes, software upgrades, etc.

ROCm Documentation: <a href="https://rocmdocs.amd.com/en/latest/index.html">https://rocmdocs.amd.com/en/latest/index.html</a>

#### **ROCm GitHub Pages:**

- <u>https://github.com/ROCmSoftwarePlatform</u>
- <u>https://github.com/ROCm-Developer-Tools</u>

Getting Help: If you have problems or need help running on Spock, please submit a support ticket to <u>help@olcf.ornl.gov</u>.







## Backup Slides



### Find CPUs available to each MPI rank

Prepend task number to lines of stdout/err.

From within an interactive job...

\$ salloc -A stf016 -t 30 -N 1 salloc: Pending job allocation 258383 salloc: job 258383 queued and waiting for resources salloc: job 258383 has been allocated resources salloc: Granted job allocation 258383 salloc: Waiting for resource configuration salloc: Nodes spock27 are ready for job

I want my 8 MPI ranks to be placed 2-per-NUMA, where ranks 0-1 are on NUMA 0, ranks 2-3 are on NUMA 1, etc.

How do I know which CPU cores are available to each MPI rank?

Cyclic across NUMAs	<pre>\$ srun -1 -n8 -c2 /bin/t 0: Cpus_allowed_list: 1: Cpus_allowed_list: 2: Cpus_allowed_list: 3: Cpus_allowed_list: 4: Cpus_allowed_list: 5: Cpus_allowed_list: 6: Cpus_allowed_list: 7: Cpus_allowed_list:</pre>	Dash -c 'grep Cpus_allowed_list /proc/self/status'         sort         0-1       16-17         32-33       48-49         2-3       18-19         34-35       50-51
Block across NUMAs	<pre>\$ srun -1 -n8 -c2 -m *: 0: Cpus_allowed_list: 1: Cpus_allowed_list: 2: Cpus_allowed_list: 3: Cpus_allowed_list: 4: Cpus_allowed_list: 5: Cpus_allowed_list: 6: Cpus_allowed_list: 7: Cpus_allowed_list:</pre>	<pre>plock /bin/bash -c 'grep Cpus_allowed_list /proc/self/status'   sort 0-1 2-3 4-5 6-7 8-9 10-11 12-13 14-15</pre>
/IAS sk)	<pre>\$ srun -1 -n8 -c8 -m *:t 0: Cpus allowed list:</pre>	<pre>olock /bin/bash -c 'grep Cpus_allowed_list /proc/self/status'   sort 0-7</pre>

• This is what is being launched on the compute node

	NUM	s/task
-	k across	just CPU
ī	Bloc	(ad

1: Cpus allowed list:

2: Cpus\_allowed\_list:

3: Cpus allowed list:

4: Cpus allowed list:

5: Cpus\_allowed\_list:

6: Cpus\_allowed\_list:

7: Cpus allowed list:

8-15

16-23

24-31

32-39

40-47

48-55

56-63



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## Slurm partitions

Spock's compute nodes are separated into 2 Slurm partitions (queues): 1 for CAAR projects and 1 for ECP.

#### **CAAR** Partition

Number of Nodes	Max Walltime
1 – 4	3 hours
5 – 16	1 hour

#### **ECP** Partition

Number of Nodes	Max Walltime
1 – 4	3 hours

- 24 total compute nodes
- Each user can have
  - $\rightarrow$  1 running and 1 eligible job at a time (per project)
  - ightarrow No limit on the number of jobs submitted.

- 12 total compute nodes
- Each user can have
  - $\rightarrow$  1 running and 1 eligible job at a time (per project)
  - ightarrow Up to 5 jobs submitted

If CAAR or ECP teams require a temporary exception to this policy, please email <u>help@olcf.ornl.gov</u> with your request and it will be given to the OLCF Resource Utilization Council (RUC) for review



### **GPU-Aware MPI**

When using GPU-Aware MPI with the Cray compiler wrappers, there are currently some extra steps needed...

The following modules must be loaded:

module load PrgEnv-cray
module load craype-accel-amd-gfx908
module load rocm

The following environment variables must be set before compiling so the executable picks up GTL

```
export PE_MPICH_GTL_DIR_amd_gfx908="-L/opt/cray/pe/mpich/8.1.4/gtl/lib"
export PE_MPICH_GTL_LIBS_amd_gfx908="-lmpi_gtl_hsa"
```

The following environment variables must be set before running

export MPIR\_CVAR\_GPU\_EAGER\_DEVICE\_MEM=0
export MPICH\_GPU\_SUPPORT\_ENABLED=1
export MPICH\_SMP\_SINGLE\_COPY\_MODE=CMA

If you set this in a script, it will need to be removed once a known issue is resolved.

In addition, the following header files and libraries must be included:

-I\${ROCM\_PATH}/include
-L\${ROCM PATH}/lib -lamdhip64 -lhsa-runtime64

