Solexa Data Crunching

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Data Crunching

- Binar – A Tour
- Resources on Binar
- How Data is Crunched
- Other Resources
Binar
Binar: Components

- HPL145
- DELLPE6850
- Clariion
- DELLSC1435
More Specs

- HPL145
  - 2 dual core Opteron/4 Gb mem
  - 55 nodes

- DELLPE6850
  - 4 quad core Intel/64 Gb mem
  - 2 nodes

- DELLSC1435
  - 2 dual core Opteron/4 Gb mem
  - 25 nodes
  - Infiniband capable
Cluster Use/Etiquette

- Use queue system to run jobs
  - Sun Grid Engine queueing
  - Fair share queueing is in use
- File space is not storage
  - Do not store data on the cluster
  - Cluster has 2.0 Tb only for workspace
- 23 Active Users
Queues

$qsub$ script basic form
$qstat$ shows jobs in queue
$qstat |grep user$ shows jobs for username

Info for Binar and Sun Grid Engine is online at
http://inside.umassmed.edu/is/acs/ResearchComputing/researchclusters.aspx
Script Template for Queue

#!/bin/bash
#$ -S /bin/bash      <- specify shell
#$ -cwd                  <- use current working dir
#$ … other sge parameters
PATH=<path to your program>:$PATH
export PATH

…rest of script …. 
Then submit script within working directory
$qsub –cwd script
Scripts

It is very important to set custom paths, esp for programs that you write, or using bioperl.

/share/… is common to all nodes.
/export/home/<user> (your home directory) is available to remote nodes.
Important Directories

/share/apps/bin commonly used programs
/share/apps/pipeline/… Solexa pipeline progs

/share/nemo/Genomes contains genome directories formatted for Eland
/share/nemo/Genomes/hg18
/share/nemo/Genomes/mm9
Resources on Binar

- EMBOSS (similar to GCG, scriptable)
- Clustalw, T_Coffee - multiple alignment
- Phylip, MrBayes - phylogenetic
- BLAST, mpi-blast
- HMMER
- Bioperl, biopython

These have their own directories.
Current Genomes on Binar

- hg18          Human (UCSC)
- mm9, mm8      Mouse (UCSC)
- dm5.5, dm5.4  Drosophila (Flybase)
- yeast         SGD
- z7v           Zebrafish
- ceWS187       C.Elegans

/share/nemo/Genomes/xxxxx
Creating a Genome file for Eland

You can run eland against a custom Genome.

2. Each piece (e.g. a chromosome) must be a separate fasta file.

3. Create a directory for the genome
   mkdir ~/mygenome

4. Run squashGenome
   /share/nemo/pileline/Eland/squashGenome ~ ~/mygenome path/to/Fasta/*.fasta

5. More detail in Pipeline docs
Pipeline processing

- Three phases
  - Image Analysis - Firecrest
  - Base Calling - Bustard
  - Sequence Mapping – Gerald
- Initial Run to generate Cross-talk and offsets
- Run the first two by lane
  - If you specify Genome Gerald can be run
  - If we don’t have the genome, let us know what and where, then we can install it.
Post-processing

- When runs are done several files are available
  - quality files, base calls
  - sequences, remapping results
  - summary data
- These are packaged and delivered to you.
- Let me know if you need custom programs for analysis, i.e. ones not delivered with the pipeline
Resources

- Cluster info
  http://inside.umassmed.edu/is/acs/ResearchComputing/researchclusters.aspx

- Pipeline Info
  http://biotools.umassmed.edu/BIOCORE/pipeline

- Solexa Google Group
  http://groups.google.com/group/solexa

- Bioc-Seq (New bioconductor group)
  https://stat.ethz.ch/mailman/listinfo/bioc-sig-sequencing

- UNIX On-line Help
  http://biotools.umassmed.edu/unixhelp