Customizing Rocks Through Rolls

Building upon Open-Source Rocks
What are Rolls?

- Software components that make up a Rocks system
- Mechanism for delivery of packages and configuration
- Rolls are the atomic unit in Rocks
- Rolls are how you should be getting your software onto a Rocks cluster
What’s inside a Roll?

● Binaries - RPM format
● Configuration data
● Installation Map
Context of a Roll
Normal RedHat Distribution
Distribution Based on Rolls

- Parallel Code / WebFarm / Grid / Computer Lab
- Message Passing / Communication Layer (MPI, MPD and Sockets)
- Cluster Software Management
- Cluster State Management / Monitoring
- Job Scheduling and Launching
- Base
- Myrinet
- PVFS
- CentOS 4.0
- Base Roll
- Stock CentOS Roll
- HPC Roll
- SGE Roll
- App Roll
Treasure Hunting

- The treasure you seek is a fully installed and configured cluster
- What are the things you’ll need
Map
Instruction set

Clues

1. Las Vegas restaurant promise to give the ______ ______.
2. Which Clive Water is likely to sell intoxicating liquor? ______ ______
3. 360 degrees of suffering. # Hint: if your a freemason ask someone who isn't.
4. 1-427 chocolate powder creates America's stereotype ______ ______
5. Down the middle, 3rd fish down ______ ______
6. How does Calvin envelops us relaxing in the Fizz? ______ ______
7. I have graduated and the end is near how can I live forever? ______ ______
8. Which BU president was an infractor child that suffered from tracidal faith yet was treated in Hartford Clinic? ______ ______
9. How many exterior walls does a detached Whiffetfield have? ______ ______
10. After four o'clock, follow 8's from on high. Where do they lead? ______ ______
11. Look away. What medieval alcohol is on display? ______ ______
12. Dining has never been so self-explanatory ______ ______
13. Ropes and fire disturb the sleepers, who left them where they lay? ______ ______
14. Now you too must leave them where they lay. What set of three and group of four were within a casual sphere, while standing in a similar array? ______ ______
15. Triangular green, enclosing greedy sculpture - but how many wooden frames are there to support your frame from its view? ______ ______
16. On the floor that treasure island belongs to Adam and ______ ______
17. Breaks cupboard ______ ______
18. I think of a title, I swap the last two words and find it surrounded by those words. What are they surrounded by? ______ ______
19. What is the only surname that is repeated in the physics academic staff? ______ ______
20. Upon the clear blue sky share a collection of subjects collide ______ ______
21. Lead to the crescent moon. From the port hole how many wheels can you see? ______ ______
22. 522 is the sum of four numbers on what objects? Compute ______ ______
23. How many English letters left, along the top of the colour cascade? # Hint: not through doors ______ ______
Resources
Translate that to a Roll

- Graph file $\iff$ Installation Map $\iff$ Map
- Node Files $\iff$ Configuration Data $\iff$ Instruction set
- RPM/Binaries $\iff$ Resources
Making your own Roll
How do you start a Roll?

◆ On a Rocks V system -
  • # cd /export/site-roll/rocks/src/roll
  • # ./bin/make-roll-dir.py --name test

⇒ This creates a directory structure for a Roll, with graphs directory, nodes directory, and source directory.
Example: Bio Roll
What’s inside the Bio Roll?

- Bio-informatics software -
  - NCBI Blast
  - MPI Blast
  - HMMER
  - GROMACS
  - EMBOSS
  - Phylip
  - T-Coffee
What’s inside the Roll?

-bash-3.00# pwd
/export/devel/hg/rocks/src/roll/bio

-bash-3.00# ls
Makefile graphs src
bootstrap.sh nodes version.mk

-bash-3.00# find nodes/
nodes/
nodes/bio-base.xml
nodes/bio-head.xml
nodes/bio-req.xml

-bash-3.00# find graphs/

graphs/

graphs/default

graphs/default/bio.xml

-bash-3.00#
What’s inside the graph file?

<graph>
  <edge from="compute">
    <to>bio-base</to>
  </edge>
  ……
  <edge from="hpc-server">
    <to>bio-head</to>
  </edge>
</graph>
How does the graph look?
How does a node file look?

<kickstart>
  <package>hmmer</package>
  <package>ncbi</package>
  ...
  <package>mpiblast</package>
<post>
  # Shell Scripts to be run after installation
  <file name=.ncbirc>
  file contents
  </file>
  ...
  ...
  ...
  # Shell Scripts to be run after installation
</post>
</kickstart>
Node files are the instruction sets of the roll
To Re-iterate

Bio-informatics Applications
Configuration Information
How does it fit in?

Parallel Code / WebFarm / Grid / Computer Lab

Message Passing / Communication Layer
(MPI, MPD and Sockets)

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Cluster Software Management
Cluster State Management / Monitoring

Base

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How does all this help you?

- Roll mechanism is the recommended way of deploying software on a Rocks cluster
- It fits into the framework of Rocks
- It’s reproducible
- It scales