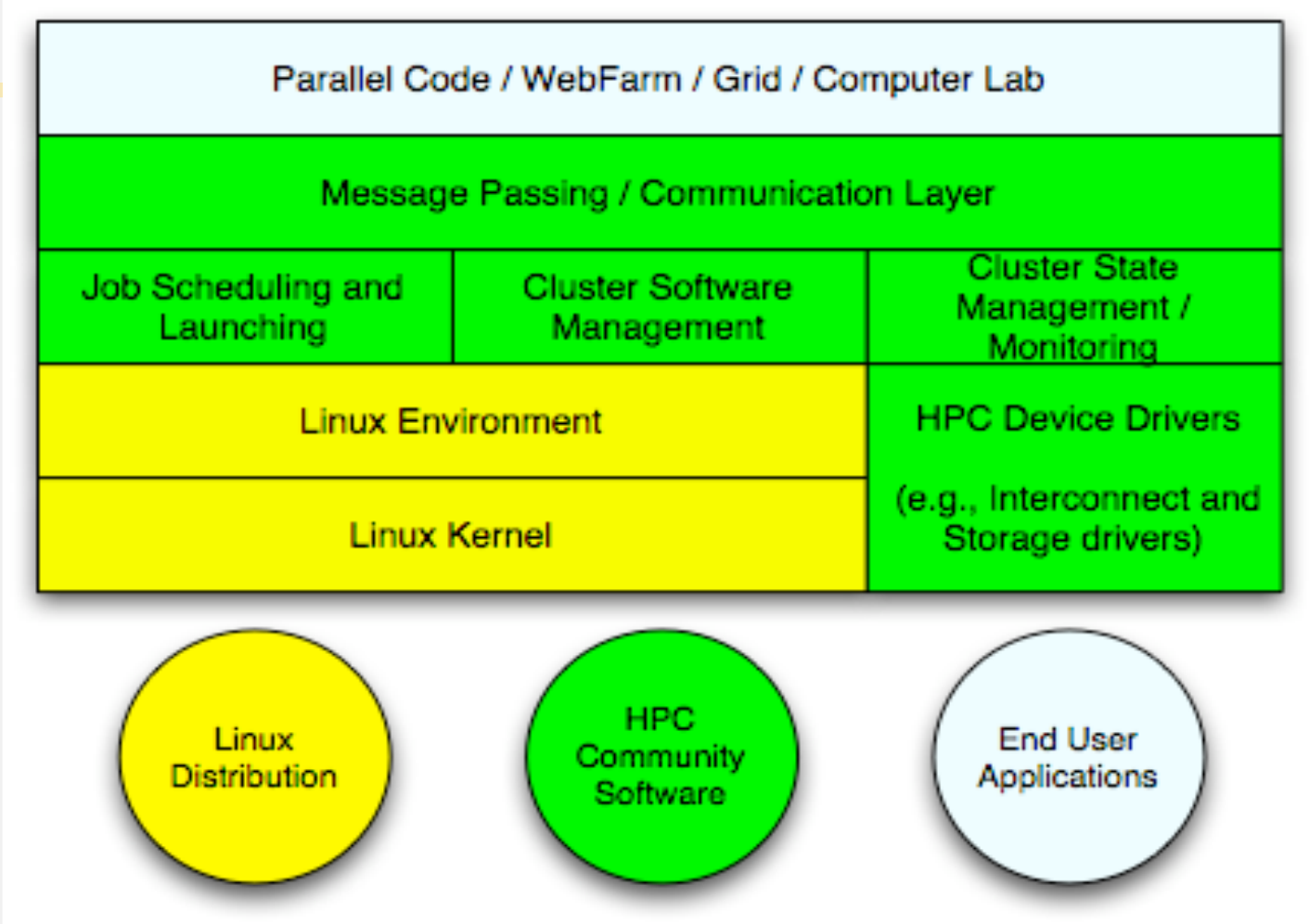
Roll Development Basics

Philip Papadopoulos

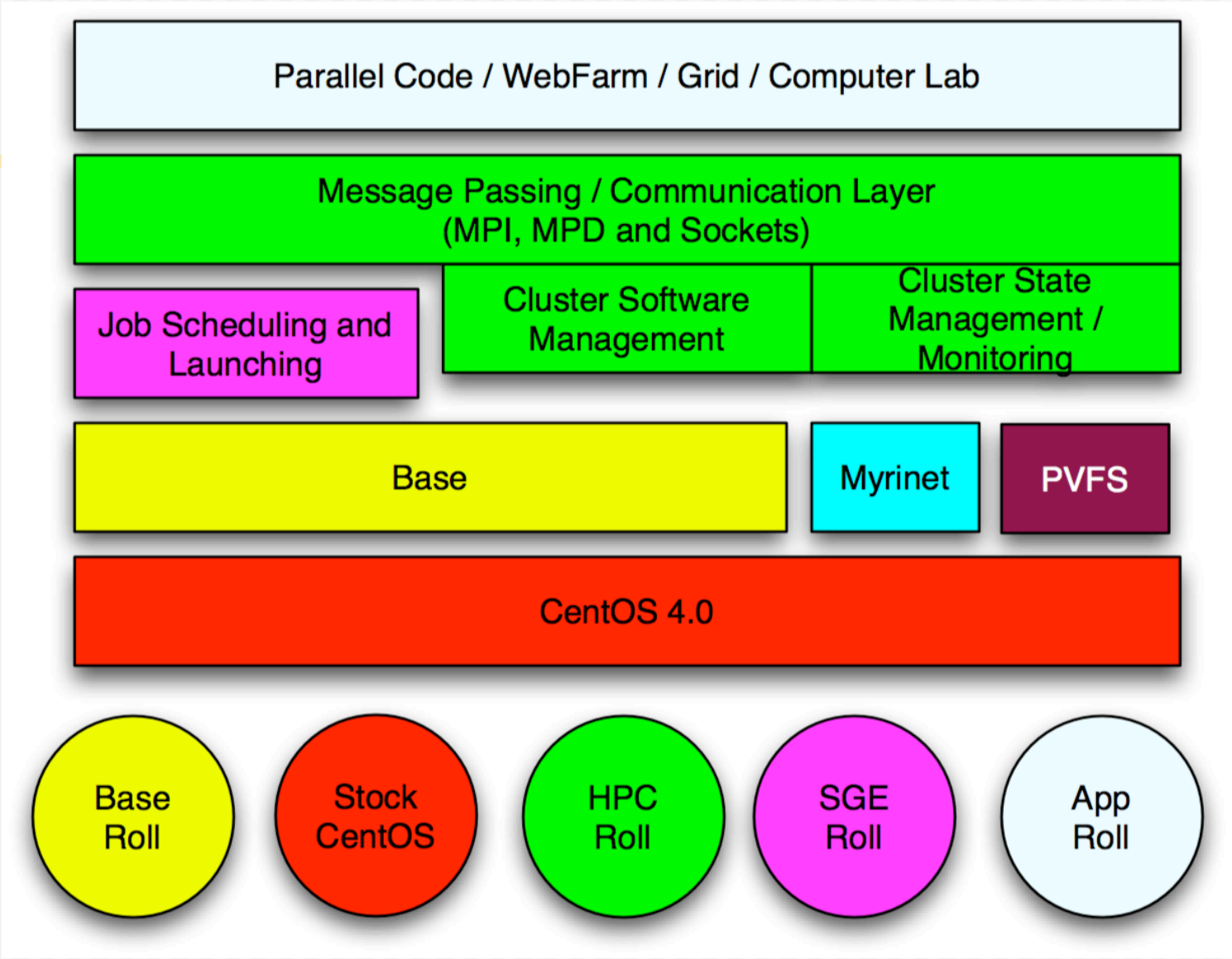
© 2007 UC Regents

Normal RedHat Distribution



© 2008 UC Regents

Distribution Based on Rolls



© 2008 UC Regents

Treasure Hunting

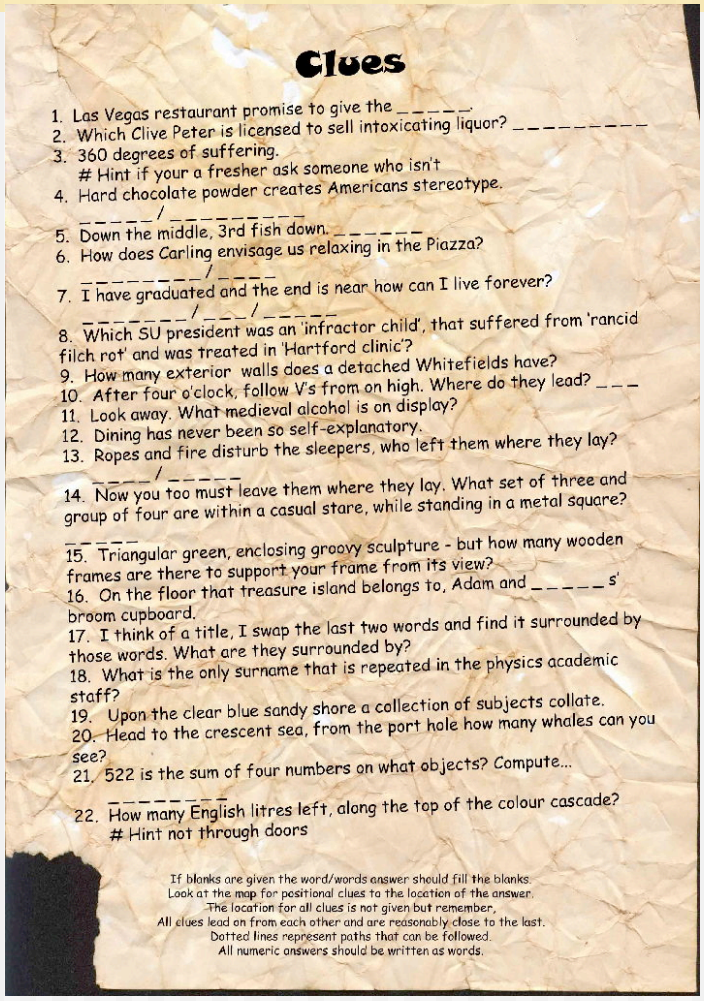
- The treasure you seek is a fully installed and configured cluster
- What are the things you'll need

© 2008 UC Regents

Map

© 2008 UC Regents

Instruction set



Clues

1. Las Vegas restaurant promise to give the _ _ _ _ _.
2. Which Clive Peter is licensed to sell intoxicating liquor? _ _ _ _ _ _ _ _ _
3. 360 degrees of suffering.
   # Hint if your a fresher ask someone who isn't
4. Hard chocolate powder creates Americans stereotype.
   _ _ _ _ _ / _ _ _ _ _ _ _ _
5. Down the middle, 3rd fish down. _ _ _ _ _ _
6. How does Carling envisage us relaxing in the Piazza?
   _ _ _ _ _ _ _ _ / _ _ _ _
7. I have graduated and the end is near how can I live forever?
   _ _ _ _ _ _ / _ _ _ / _ _ _ _ _
8. Which SU president was an 'infractor child', that suffered from 'rancid filch rot' and was treated in 'Hartford clinic'?
9. How many exterior walls does a detached Whitefields have?
10. After four o'clock, follow V'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 are within a casual stare, while standing in a metal square?
    _ _ _ _ _
15. Triangular green, enclosing groovy 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 _ _ _ _ _ s' broom cupboard.
17. I think of a title, I swap the last two words and find it surrounded by those words. What are they surrounded by?
18. What is the only surname that is repeated in the physics academic staff?
19. Upon the clear blue sandy shore a collection of subjects collate.
20. Head to the crescent sea, from the port hole how many whales can you see?
21. 522 is the sum of four numbers on what objects? Compute...
    _ _ _ _ _ _ _ _
22. How many English litres left, along the top of the colour cascade?
    # Hint not through doors

If blanks are given the word/words answer should fill the blanks.
Look at the map for positional clues to the location of the answer.
The location for all clues is not given but remember,
All clues lead on from each other and are reasonably close to the last.
Dotted lines represent paths that can be followed.
All numeric answers should be written as words.

© 2008 UC Regents

Resources

© 2008 UC Regents

Translate that to a Roll

- Graph file ⇔ Installation Map ⇔ Map
- Node Files ⇔ Configuration Data ⇔ Instruction set
- RPM/Binaries ⇔ Resources

© 2008 UC Regents

Available Rolls for Rocks 5.0

- Rolls we provide
  - Core: Base, Kernel, Web Server, OS
  - Area51 - security analysis tools
  - Bio - bioinformatics tools
  - Condor
  - HPC - MPICH and cluster tools
  - Ganglia - cluster monitoring
  - PVFS2 - parallel file system
  - SGE
  - Viz
  - Java

© 2007 UC Regents

Available Rolls for Rocks 5.0

- Rolls produced by academic community
  - PBS/Maui
    - HPC group at University of Tromso, Norway
  - APBS (Adaptive Poisson-Boltzmann Solver)
    - NBCR group, UCSD
  - Grid Roll
    - ThaiGrid, Thailand

© 2007 UC Regents

Available Rolls for Rocks 5.0

- Rolls produced by commercial entities
  - Absoft, Cisco OFED, PGI, Intel, Moab
    - ClusterCorp
  - MX/GM - Myrinet
    - Myricom (4.3)
  - CUDA – GPU Programming
    - Nvidia (4.3)

© 2007 UC Regents

Roll Contents

- RPMS
  - Your software.
  - Tasks:
    - Package bits into RPM
- Kickstart Graph
  - Your configuration.
  - Tasks:
    - Verify correct files exist after installation
    - Verify correct operation on frontend and compute nodes
    - Test, Test, Test

© 2007 UC Regents

Rolls Codify Configuration for Cluster Services

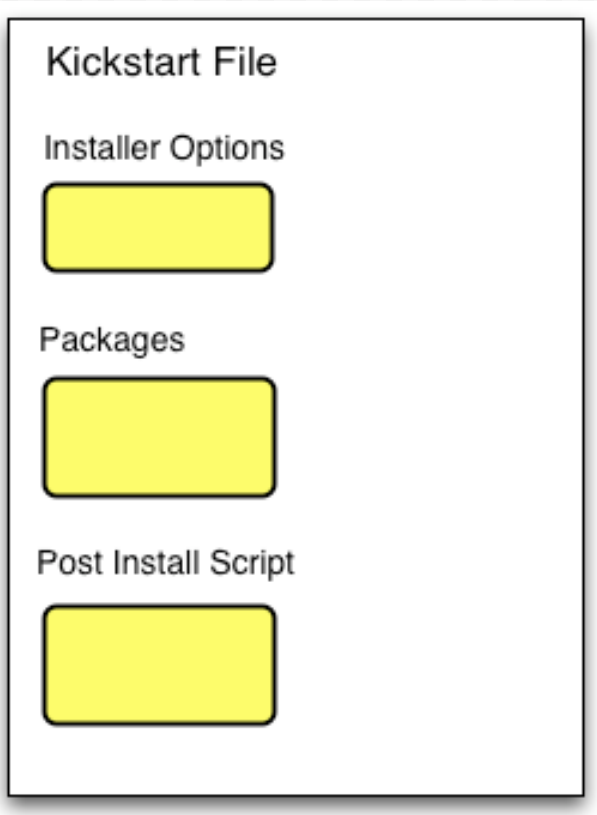
- How do you configure NTP on compute nodes?
  - ntp-client.xml:

```
<post>

<!-- Configure NTP to use an external server -->

<file name="/etc/ntp.conf">
server <var name="Kickstart_PrivateNTPHost"/>
authenticate no
driftfile /var/lib/ntp/drift
</file>

<!-- Force the clock to be set to the server upon reboot -->

/bin/mkdir -p /etc/ntp

<file name="/etc/ntp/step-tickers">
<var name="Kickstart_PrivateNTPHost"/>
</file>

<!-- Force the clock to be set to the server right now -->

/usr/sbin/ntpdate <var name="Kickstart_PrivateNTPHost"/>
/sbin/hwclock --systohc
</post>
```

© 2007 UC Regents

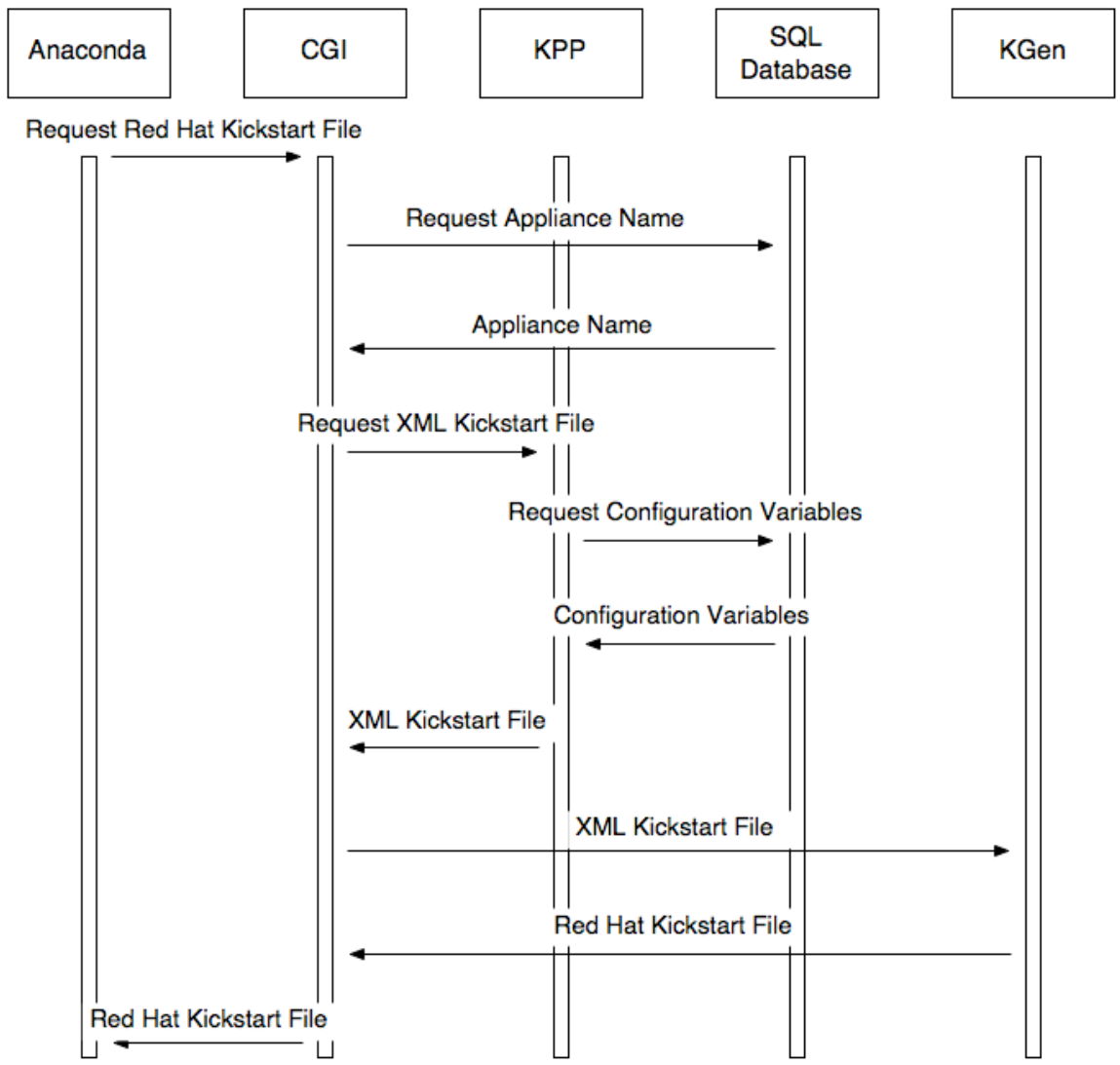
Kickstart File

- RedHat's Kickstart: DNA of a node
  - Monolithic flat ASCII file
    - "Main": disk partitioning, timezone
    - "Packages": list of RPM names
    - "Post": shell scripts for config
  - Limited macro language
  - Requires forking based on site information and node type.



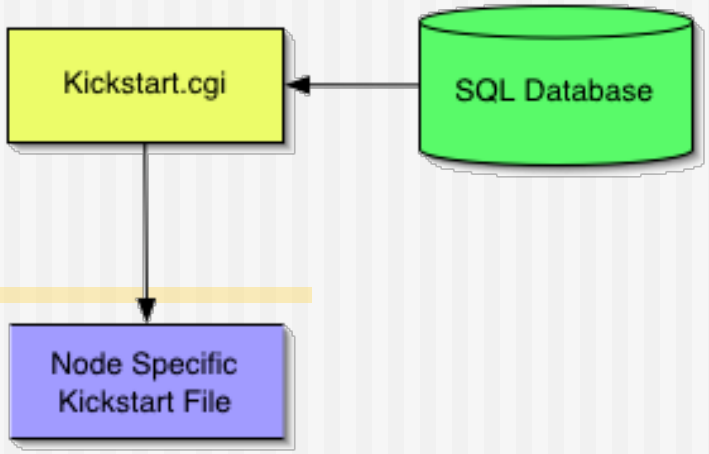
© 2007 UC Regents

Getting A Kickstart File



© 2007 UC Regents

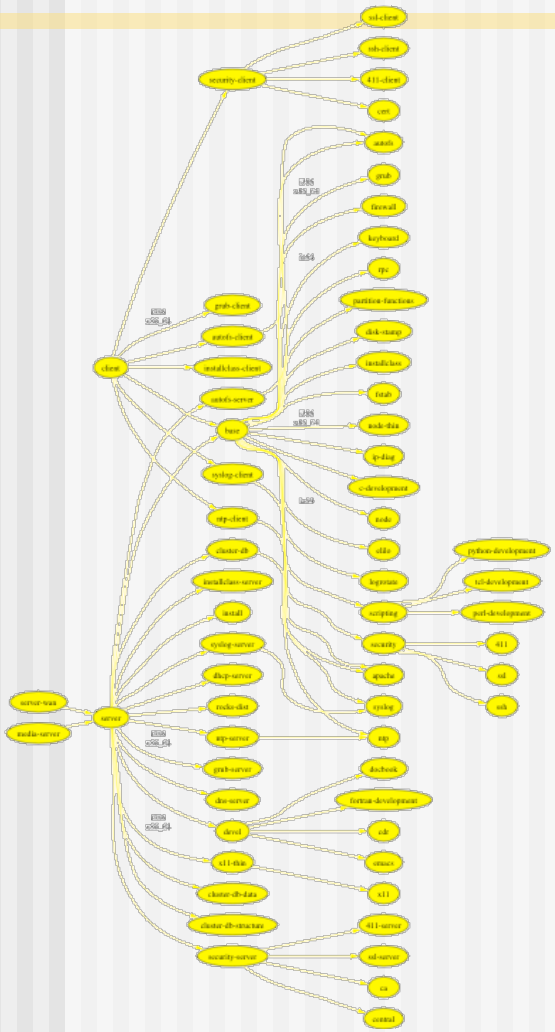
Kickstart File

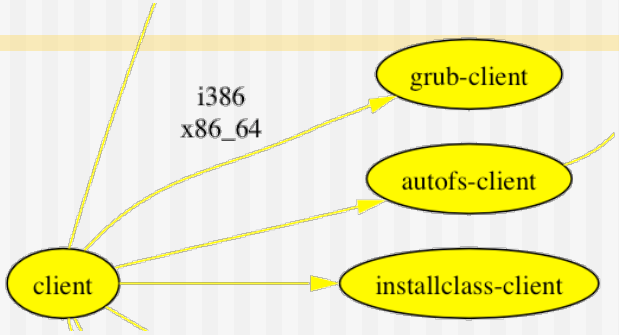


- Rocks XML Kickstart
  - Decompose a kickstart file into nodes and a graph
    - Graph specifies OO framework
    - Each node specifies a service and its configuration
  - SQL Database to help site configuration
  - “Compile” flat kickstart file from a web cgi script

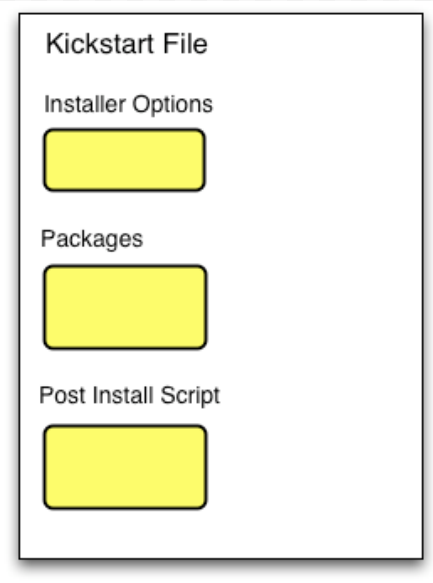
© 2007 UC Regents

Kickstart Graph for Kgen

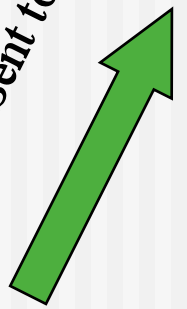




Preprocess (kpp)

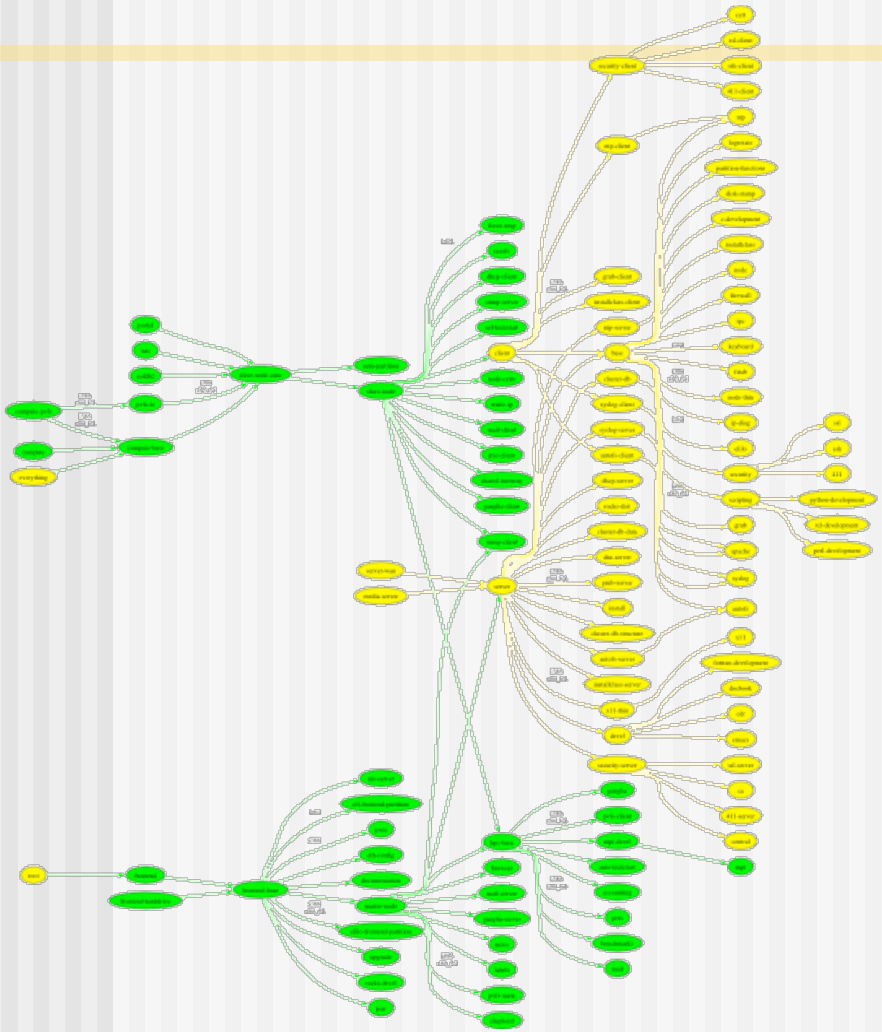


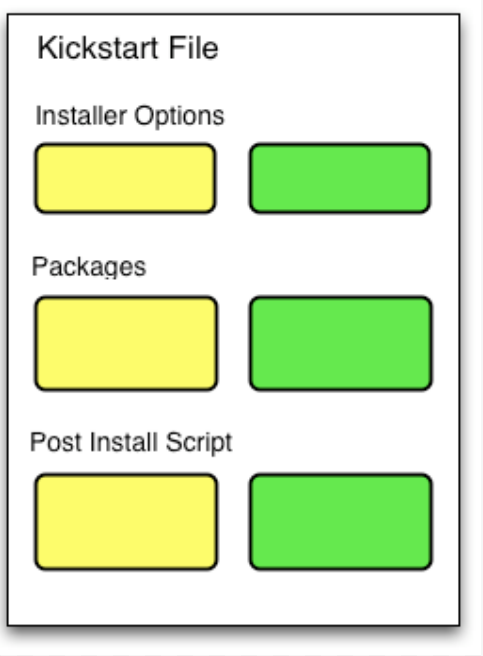
Sent to node (http)



© 2007 UC Regents

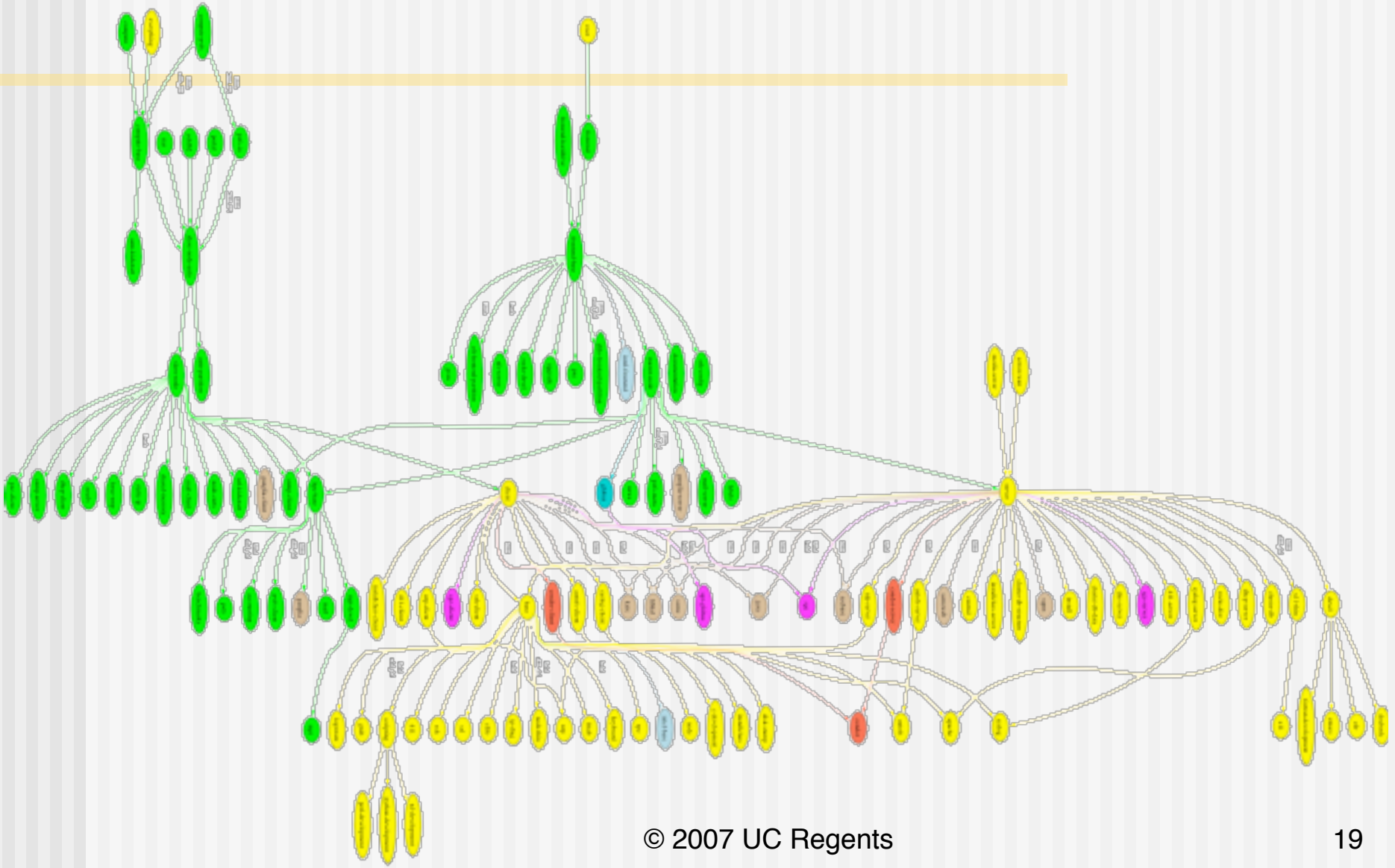
Kickstart Graph with Roll





© 2007 UC Regents

Full Kickstart Graph



© 2007 UC Regents

Kickstart XML Language

- Graph contains
  - Nodes
    - Rich language to help with configuration tasks
  - Edges
    - Simple. Defines node *MEMBERSHIP* in compiled kickstart files
  - Order
    - Simple syntax. Defines *POST SECTION ORDER* among nodes.

© 2007 UC Regents

Example Roll: Sweetroll

- Will use a fictitious roll named “Sweetroll”

```
<?xml version="1.0" standalone="no"?>

<kickstart>
  <description>
The sweet roll.
  <description>
</kickstart>
```

© 2007 UC Regents

Kickstart Nodes

- Altering Default Nodes
  - Can *replace* or *extend* default nodes in Roll
    - Extend: concatenated to the end of a default node
    - Replace: overwrite default node
  - *Discouraged use: Reserved for end users*
  - Extend by name: extend-[node].xml
    - sweetroll/nodes/extend-compute.xml
  - Replace by name: replace-[node].xml
    - sweetroll/nodes/replace-compute.xml

© 2007 UC Regents

Kickstart Nodes

- Graph
  - Nodes
    - Rich language to help with configuration tasks
    - “Main” section
    - “Package” section
    - “Post” section
    - “Installclass” section
      - Used to modify Anaconda

© 2007 UC Regents

Nodes XML Tools: <var>

- Get Variables from Database
  - `<var name="Kickstart_PrivateAddress"/>`
  - `<var name="Node_Hostname"/>`

```
10.1.1.1
compute-0-0
```

  - Can grab any value from the *app_globals* database table

© 2007 UC Regents

<var> values from app_globals

←T→		ID	Membership	Service	Component	Value
Edit	Delete	6	0	Info	ClusterLatlong	N32.87 W117.22
Edit	Delete	16	0	Info	ClusterName	Onyx
Edit	Delete	30	0	Info	CertificateState	California
Edit	Delete	34	0	Info	CertificateOrganization	Rocksclusters
Edit	Delete	37	0	Info	CertificateLocality	San Diego
Edit	Delete	44	0	Info	CertificateCountry	US
Edit	Delete	45	0	Info	ClusterURL	http://onyx.rocksclusters.org/
Edit	Delete	50	0	Info	RocksRelease	Makalu
Edit	Delete	52	0	Info	RocksVersion	3.3.0
Edit	Delete	54	0	Info	ClusterContact	admin@onyx.rocksclusters.org
Edit	Delete	58	0	Info	Born	2005-02-23 14:30:13
Edit	Delete	1	0	Kickstart	PrivateKickstartBasedir	install
Edit	Delete	2	0	Kickstart	PartsizeRoot	6000
Edit	Delete	3	0	Kickstart	PublicAddress	198.202.88.74
Edit	Delete	4	0	Kickstart	PublicHostname	onyx.rocksclusters.org

- Combine “Service” and “Component”
  - For example, Kickstart_PublicAddress

© 2007 UC Regents

Nodes XML Tools: <var>

- <var> attributes
  - name
    - Required. Format is “Service_Component”
    - Service and Component relate to column names in the app_global database table.
  - val
    - Optional. Sets the value of this variable
      - <var name=“Info_ClusterName” val=“Seinfeld”/>
  - ref
    - Optional. Set this variable equal to another
      - <var name=“Info_Weather” ref=“Info_Forecast”/>

© 2007 UC Regents

Nodes XML Tools: <eval>

- Do processing on the frontend when the kickstart file is generated (by the CGI script):
  - **<eval shell="bash">**
- To insert the Rocks release info in the kickstart file:

```
<eval shell="bash">
cat /etc/rocks-release
</eval>
```

Rocks release 4.2.1 (Cydonia)

© 2007 UC Regents

Nodes XML Tools: <eval>

- <eval> attributes
  - shell
    - Optional. The interpreter to use. Default “sh”
  - mode
    - Optional. Value is quote or xml. Default of quote specifies for kpp to escape any XML characters in output.
    - XML mode allows you to generate other tags:
      - <eval shell=“python” mode=“xml”>
        - import time
        - now = time.time()
        - print “<var name=‘Info_Now’ val=‘%s’/>” % now
      - </eval>

© 2007 UC Regents

Nodes XML Tools: <eval>

- Inside <eval> variables are not accessed with <var>: use the environment instead.

```
<eval shell="python">
import os
print "My NTP time server is",
 os.environ['Kickstart_PublicNTPHost']
print "Got it?"
</eval>
```

My NTP time server is time.apple.com
Got it?

© 2007 UC Regents

Nodes XML Tools <include>

- Auto-quote XML characters in a file
  - **`<include file="foo.py"/>`**
- Quotes and includes file

  `sweetroll/include/foo.py`
- foo.py (native) → foo.py (quoted xml):

```
#!/usr/bin/python

import sys

def hi(s):
        print >> sys.stderr, s
```

```
#!/usr/bin/python

import sys

def hi(s):
        print &gt;&gt; sys.stderr, s
```

© 2007 UC Regents

Nodes XML Tools: <include>

- <include> attributes
  - file
    - Required. The file to include (relative to “include/”) dir in roll src.
  - mode
    - Optional. Value is quote or xml. Default of quote specifies for kpp to escape any XML characters in file.
      - <include file=“my-favorite-things” mode=“quote”/>

© 2007 UC Regents

Nodes XML Tools <file>

- Create a file on the system:
  - **<file name="/etc/hi-mom" mode="append">**
    - **How are you today?**
  - **</file>**
- Used extensively throughout Rocks post sections
  - Keeps track of alterations automatically via RCS.

```
<file name="/etc/hi" perms="444">
How are you today?
I am fine.
</file>
```

```
…RCS checkin commands...
cat > /etc/hi << 'EOF'
How are you today?
I am fine.
EOF
chmod 444 /etc/hi-mom
…RCS cleanup commands…
```

© 2007 UC Regents

Nodes XML Tools: <file>

- <file> attributes
  - name
    - Required. The full path of the file to write.
  - mode
    - Optional. Value is “create” or “append”. Default is create.
  - owner
    - Optional. Value is “user.group”, can be numbers or names.
      - <file name=“/etc/hi” owner=“daemon.root”>
  - perms
    - Optional. The permissions of the file. Can be any valid “chmod” string.
      - <file name=“/etc/hi” perms=“a+x”>

© 2007 UC Regents

Nodes XML Tools: <file>

- <file> attributes (continued)
  - vars
    - Optional. Value is “literal” or “expanded”. In literal (default), no variables or backticks in file contents are processed. In expanded, they work normally.
      - <file name=“/etc/hi” vars=“expanded”>
        - The current date is `date`
      - </file>
  - expr
    - Optional. Specifies a command (run on the frontend) whose output is placed in the file.
      - <file name=“/etc/hi” expr=“/opt/rocks/dbreport hi”/>

© 2007 UC Regents

Fancy <file>: nested tags

```
<file name="/etc/hi">

Rocks release:
<eval>
date +"%d-%b-%Y"
echo ""
cat /etc/rocks-release
</eval>

</file>
```

…RCS checkin commands...
cat > /etc/hi << 'EOF'

Rocks release:
13-May-2005

Rocks release 4.2.1 (Cydonia)

EOF
…RCS cleanup commands…

© 2007 UC Regents

Nodes Main

- Used to specify basic configuration:
  - timezone
  - mouse, keyboard types
  - install language
- Used more rarely than other tags
- Rocks main tags are usually a straight translation:

```
<main>

  <timezone>America/Mission_Beach
  </timezone>

</main>
```

```
…
timezone America/Mission_Beach
…
rootpw --iscrypted sndk48shdlwis
mouse genericps/2
url --url http://10.1.1.1/install/rocks-dist/..
```

© 2007 UC Regents

Nodes Main: Partitioning

- `<main>`
  - `<part> / --size 8000 --ondisk hda </part>`
  - `<part> swap --size 1000 --ondisk hda </part>`
  - `<part> /mydata --size 1 --grow --ondisk hda </part>`
- `</main>`

```
part / --size 8000 --ondisk hda
part swap --size 1000 --ondisk hda
part /mydata --size 1 --grow --ondisk hda
```

© 2007 UC Regents

Nodes Packages

- **`<package>java</package>`**
  - Specifies an RPM package. Version is automatically determined: take the *newest* rpm on the system with the name 'java'.
- **`<package arch="x86_64">java</package>`**
  - Only install this package on x86_64 architectures
- **`<package arch="i386,x86_64">java</package>`**

```
<package>newcastle</package>
<package>stone-pale</package>
<package>guinness</package>
```

```
%packages
newcastle
stone-pale
guinness
```

© 2007 UC Regents

Nodes Packages

- RPMS are installed brute-force: no dependancy checking, always --force

© 2007 UC Regents

Nodes Packages

- RPM name is a basename (not fullname of RPM)
  - For example, RPM name of package below is ‘kernel’

```
# rpm -qip /home/install/rocks-dist/lan/i386/RedHat/RPMS/kernel-2.6.9-22.EL.i686.rpm
Name        : kernel                       Relocations: (not relocatable)
Version     : 2.6.9                           Vendor: CentOS
Release     : 22.EL                        Build Date: Sun 09 Oct 2005 03:01:51 AM WET
Install Date: (not installed)              Build Host: louisa.home.local
Group       : System Environment/Kernel    Source RPM: kernel-2.6.9-22.EL.src.rpm
Size        : 25589794                        License: GPLv2
Signature   : DSA/SHA1, Sun 09 Oct 2005 10:44:40 AM WET, Key ID a53d0bab443e1821
Packager    : Johnny Hughes <johnny@centos.org>
Summary     : the linux kernel (the core of the linux operating system)
Description :
The kernel package contains the Linux kernel (vmlinuz), the core of any
Linux operating system
```

© 2007 UC Regents

Nodes Post

- `<post>` for *Post-Install* configuration scripts
- Configuration scripts in <post> section run after *all* RPMs have been installed.
  - Useful: you have all your software available
  - Scripts run in “target” environment: /etc in <post> will be /etc on the final installed system
- Scripts are always non-interactive
  - No Human is driving

© 2007 UC Regents

Nodes Post

ntp-client.xml

```
<post>

/bin/mkdir -p /etc/ntp
/usr/sbin/ntpdate <var name="Kickstart_PrivateNTPHost"/>
/sbin/hwclock --systohc

</post>
```

```
%post

/bin/mkdir -p /etc/ntp
/usr/sbin/ntpdate 10.1.1.1
/sbin/hwclock --systohc
```

© 2007 UC Regents

Nodes Post Section

- Scripts have minimal $PATH (/bin, /usr/bin)
- Error reporting is minimal
  - Write to personal log file if you need debugging
- Not all services are up. Network is however.
  - Order tag is useful to place yourself favorably relative to other services
- Can have multiple <post> sections in a single node

© 2007 UC Regents

Nodes XML Tools: <post>

- <post> attributes
  - arch
    - Optional. Specifies which architectures to apply package.
  - arg
    - Optional. Anaconda arguments to *%post*
      - --nochroot (rare): operate script in install environment, not target disk.
      - --interpreter: specifies script language

      - <post arg="--nochroot --interpreter /usr/bin/python">

© 2007 UC Regents

Post Example: PXE config

```
<post arch="x86_64,i386">
mkdir -p /tftpboot/pxelinux/pxelinux.cfg

<file name="/tftpboot/pxe../default">
default ks
prompt 0
label ks
        kernel vmlinuz
        append ks inird=initrd.img……
</file>
</post>

<post arch="ia64">

<!-- Itaniums do PXE differently -->
…

</post>
```

for an x86_64 machine:

```
cat >> /root/install.log << 'EOF'
./nodes/pxe.xml: begin post section
EOF
mkdir -p /tftpboot/pxelinux/pxelinux.cfg

…RCS…
cat > /tftpboot/pxe../default << EOF
default ks
prompt 0
…
EOF
..RCS…
```

© 2007 UC Regents

A Real Node file: ssh

```
<kickstart>
          <description>
          Enable SSH
          </description>

          <package>openssh/package>
          <package>openssh-clients</package>
          <package>openssh-server</package>
          <package>openssh-askpass</package>
<post>

<file name="/etc/ssh/ssh_config">
Host *
         CheckHostIP                 no
         ForwardX11                  yes
         ForwardAgent                yes
         StrictHostKeyChecking       no
         UsePrivilegedPort           no
         FallBackToRsh               no
         Protocol                    1,2
</file>

chmod o+rx /root
mkdir /root/.ssh
chmod o+rx /root/.ssh

</post>
</kickstart>
```

© 2007 UC Regents

Graph Edges

- <edge>
- Specifies *membership* in a kickstart file
  - To make a kickstart file for a compute node:
    1. Take contents of “compute” xml node
    2. Follow all outgoing edges from “compute”
    3. Take all contents of child node
    4. Follow all its outgoing edges, etc, etc, etc
  - Edges between nodes listed in a “graph” file
    - sweetroll/graphs/default/sweetroll.xml
  - All graph files concatenated together
    - E.g., base.xml, hpc.xml, sweetroll.xml, etc. all concatenated

© 2007 UC Regents

Graph Edges: <edge>

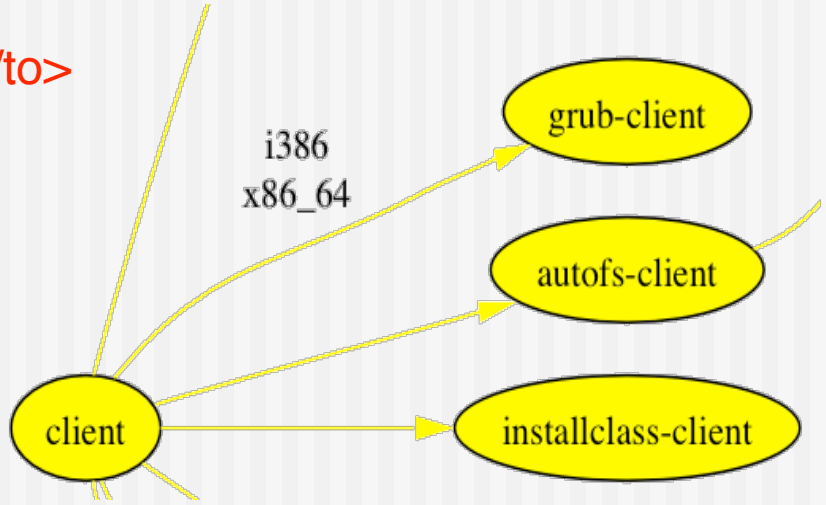
- <edge> attributes
  - from
    - Required. The name of a node at end of the edge
      - <edge from="base" to="autofs"/>
  - to
    - Required. The name of a node at the head of an edge
  - arch
    - Optional. Which architecture should follow this edge. Default is all.
  - gen
    - Optional. Which generator should follow this edge. Default is "kgen"

© 2007 UC Regents

Graph Edges

<edge from="security-server" to="central"/>

<edge from="client">
    <to arch="i386,x86_64">grub-client</to>
    <to>autofs-client</to>
    <to>installclass-client</to>
</edge>



© 2007 UC Regents

Graph Ordering

- Added recently to give us control over when node <post> sections are run
  - <order head="database">
    - <tail>database-schema</tail>
  - </order>
- *database* node appears before *database-schema* in all kickstart files.
- Special HEAD and TAIL nodes represent “first” and “last” (post sections that you want to run first/last)
  - <order head=“installclass” tail=“HEAD”/> BEFORE HEAD
  - <order head=“TAIL” tail=“postshell”/> AFTER TAIL

© 2007 UC Regents

Graph Ordering: <order>

- <order> attributes
  - head
    - Required. The name of a node whose <post> section will appear BEFORE in the kickstart file.
  - tail
    - Required. The name of a node whose <post> section will appear AFTER in the kickstart file.
      - <order head="grub" tail="grub-server"/>
  - arch
    - Optional. Which architecture should follow this edge. Default is all.
  - gen
    - Optional. Which generator should follow this edge. Default is "kgen"

© 2007 UC Regents

When Things Go Wrong

- Test your Kickstart Graph
  - Check XML syntax: xmllint
  - Make a kickstart file
    - Make kickstart file as a node will see it

```
# rocks list host profile compute-0-0
```

© 2007 UC Regents

When Things Go Wrong

- Test your Kickstart Graph
  - Check XML syntax: xmllint
    - # cd sweetroll/nodes
    - **# xmllint --noout sweetroll.xml**

```
<?xml version="1.0" standalone="no"?>

<kickstart>
  <description>
The sweet roll. This roll is just sweet!
  <description>
</kickstart>
```

```
# xmllint --noout sweetroll.xml

sweetroll.xml:7: parser error : Opening and
ending tag mismatch: description line 6 and
kickstart
</kickstart>
                ^
```

© 2007 UC Regents

When Things Go Wrong

- Test your Kickstart Graph
  - Make a kickstart file
  - First, install Sweetroll on the frontend “on-the-fly”:
    - # make roll;
    - # rocks add roll sweetroll-*.iso
    - # rocks enable sweetroll
    - # cd /home/install; rocks-dist dist
    - # kroll sweetroll > /tmp/install-sweetroll.sh
    - # sh /tmp/install-sweetroll.sh

© 2007 UC Regents

When Things Go Wrong

- Test your Kickstart Graph
  - With Sweetroll XML in place:

    # dbreport kickstart compute-0-0 > /tmp/ks.cfg

  - Open /tmp/ks.cfg and look for the section:

```
cat >> /root/install.log << 'EOF'
./nodes/sweetroll.xml: begin post section
```

  - (We do this 10 times a day during release phase)
  - *Exactly the same as what a compute node actually sees during installation*

© 2007 UC Regents

When Things Go Wrong

- Test your Kickstart Graph
  - Low level functionality test: kpp
    - Run the kickstart compilers by hand
      - For more difficult to diagnose problems
  - KPP is Kickstart Pre Processor: runs <eval>, <var>
  - KGEN is generator: turns XML into kickstart
    - # cd /home/install/rocks-dist/lan/x86_64/build
    - # kpp sweetroll
    - # kpp sweetroll | kgen

© 2007 UC Regents

RPM Building

© 2007 UC Regents

Building an RPM

- Generic RPMs are built with ‘spec’ file and ‘rpmbuild’
- It takes time to learn how to write a spec file
- Can use Rocks development source tree to create RPMs without having to make a spec file

© 2007 UC Regents

Building an RPM

- Short story
  - Go to /export/site-roll/rocks/src/roll on a Rocks Frontend
  - Make a new roll from a ‘template’ roll
  - Download the source tarball
  - Update a description file (version.mk)
  - Execute: make rpm
    - Assumes tarball adheres to ‘configure, make, make install’

© 2007 UC Regents

Using Rocks Make Environment

- Rocks frontend has the tooling to build rools
- cd /export/site-roll/rocks/src/roll/
- Let's Make an RPM ---
- First, make a template for a new roll

```
# ./bin/make-roll-dir.py  --name valgrind --version 3.3.0
# ls valgrind
graphs  Makefile  nodes  src  version.mk
```

- **valgrind/src/valgrind has what you need to make an rpm**

© 2007 UC Regents

src/valgrind – a working example

```
# cd valgrind/src/valgrind
# wget http://valgrind.org/downloads/
   valgrind-3.3.0.tar.bz2
# bunzip2 valgrind.*.bz2; gzip valgrind.tar
# rm *.spec.in
# edit version.mk so that
TARBALL_POSTFIX = tar.gz
# make rpm
# ls ../../RPMS/x86_64/valgrind-3.3.0-1.x86_64.rpm
../../RPMS/x86_64/valgrind-3.3.0-1.x86_64.rpm

That's it….. Works because valgrind is built using
"./configure; make; make install"
```

© 2007 UC Regents

There is “magic” here

- We use RPM as a transport
  - rpmbuild as the “package builder”
    - Needs an rpm spec file to drive it
    - We build a generic spec file automatically
- Standard RPM file tree needs the following directories to work properly

BUILD SOURCES SPECS

© 2007 UC Regents

Step 1 of Magic – Create a Source File to go in SOURCES

Builds a tarball of your current directory called <name>-<version>.tar.gz

Copies this file into the SOURCES Directory

* contains this complete directory including the “real” software tarball

© 2007 UC Regents

Step 2 of Magic

- Create a standard Redhat Spec file

```
Source: valgrind-3.3.0.tar.gz
Buildroot: `pwd`/valgrind.buildroot
%prep
    (unpack the tarball created in step 1)
%build
    (calls make build)

%install
    (calls make install)
```

© 2007 UC Regents

ls of ../../BUILD ../../SOURCES

```
# ls ../../SOURCES/
valgrind-3.3.0.tar.gz  ← Rocks-created tarball
# ls ../../BUILD/valgrind-3.3.0/  ← unpacked of above
_arch           python.mk              Rules-linux.mk
_distribution   rocks-version.mk       Rules.mk
Makefile        Rules-install.mk       Rules-rcfiles.mk
_os             Rules-linux-centos.mk  Rules-scripts.mk
valgrind-3.3.0.tar.gz version.mk
# ls ../../SPECS
valgrind.spec
```

© 2007 UC Regents

Rpmbuild used with SPEC Files as input

- Just follows directions in the Makefile eg.

```
Build:
$(TAR) -zxf $(NAME)-$(VERSION).$(TARBALL_POSTFIX) ←
   unpack actual source code
(          ← actually configure and make
   cd $(NAME)-$(VERSION);                    \
   ./configure --prefix=$(PKGROOT)/$(NAME); \
   make;                                     \
)

Equivalent logic for install
```

© 2007 UC Regents

Okay … RPM Builds. Make the roll

```
# cd /export/site-roll/rocks/src/roll/valgrind
# make clean; make roll
# ls -l valgrind*iso
-rw-r--r-- 1 root root 16433152 May 14
   22:15 valgrind-5.0-0.x86_64.disk1.iso
```

(note: have to edit graph file to define which appliance will get this rpm)

© 2007 UC Regents

Connecting into the graph

vi graphs/default/valgrind.xml (and add:)

```
<edge from="base">
    <to>valgrind</to>
</edge>
```

- (now cheat, and shortcut a full roll rebuild)

make profile; make reroll

© 2007 UC Regents

Roll is complete

- Can use it as a roll to build frontends
- A straightforward test if you have a compute node

```
# rocks add roll valgrind-5.0-0.x86_64.disk1.iso
Copying valgrind to Rolls.....31340 blocks
#rocks enable roll valgrind
#(cd /home/install; rocks-dist dist)
   …. rocks output…
# rocks list host profile compute-0-0 l grep valgrind
# ./nodes/valgrind.xml (valgrind)
roll-valgrind-usersguide
valgrind
```

© 2007 UC Regents