



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

RIC 2007
SNAP:
Symbolic Nuclear Analysis Package

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SNAP: What is it?

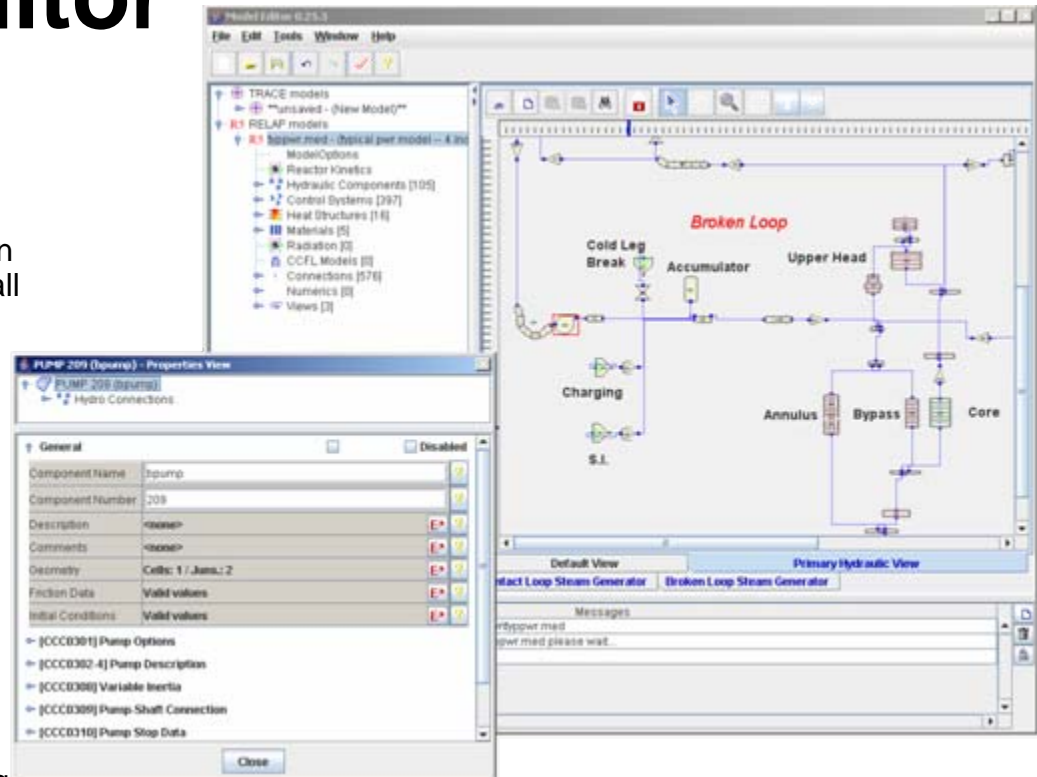
- Standard Graphical User Interface designed to simplify the use of USNRC analytical codes providing:
 - An Interface for constructing and editing input models
 - A Tool for visualization of code outputs and data
 - Runtime Job Control
 - Job organization features; keeps track of your input and output files
 - Easy access to analytical code documentation

SNAP: What's in the Package...

- SNAP is a “package” of tools
 - Model Editor
 - Run Time or “job control”
 - Visualization Tool
 - Plotting Tool

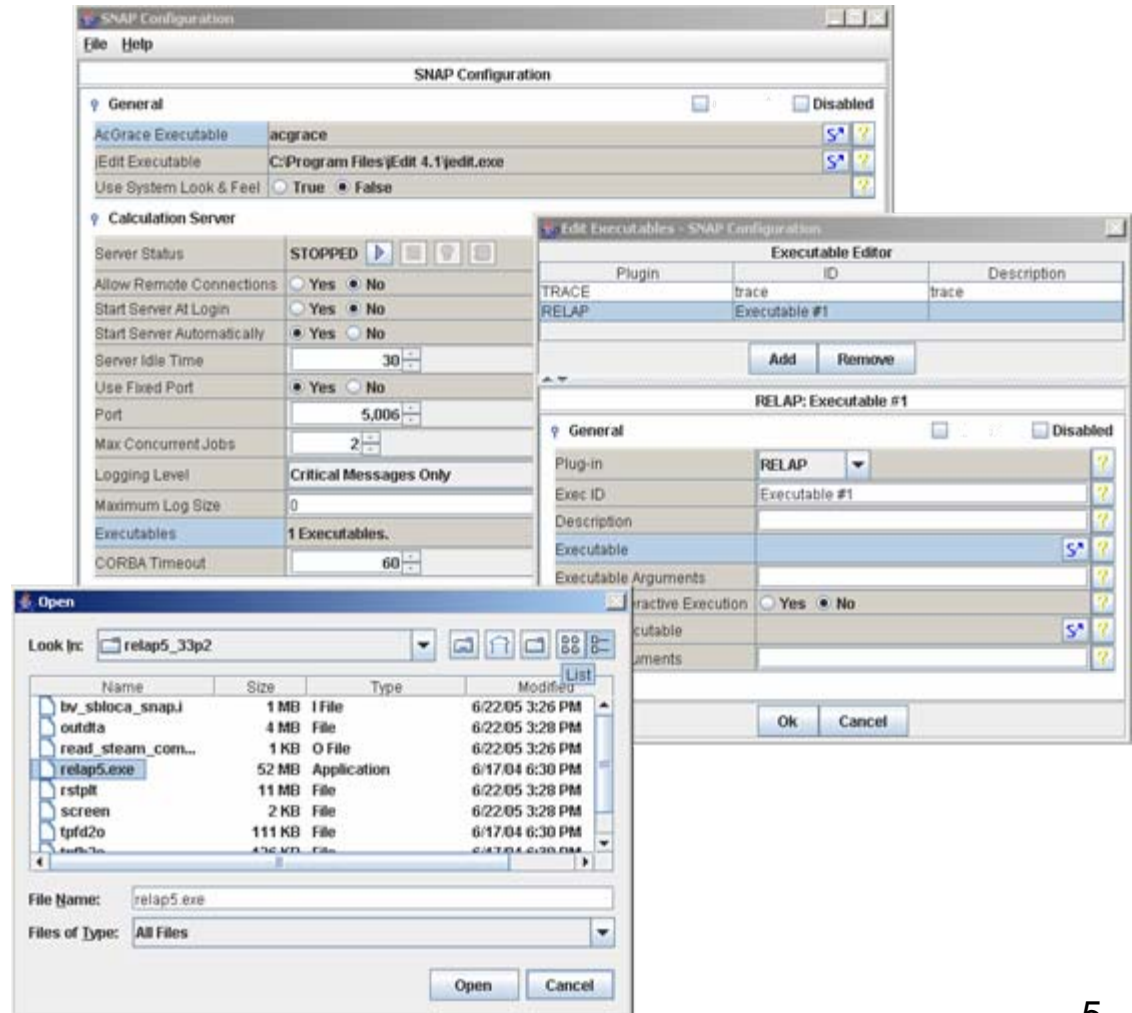
SNAP: Model Editor

- Graphically create or edit a visual representation of an input model
 - Groups of components can be placed in logically separate views (for example: all the modeling objects associated with modeling a steam generator may be placed on a single view)
 - Component connections are easily visualized and edited.
 - Helps the user to avoid common input deck formatting problems. The SNAP Model Editor can import and export models as ASCII decks.
 - Permits additional model error checking to be performed. Visual warning messages to users can be used to quickly locate potential modeling problems.



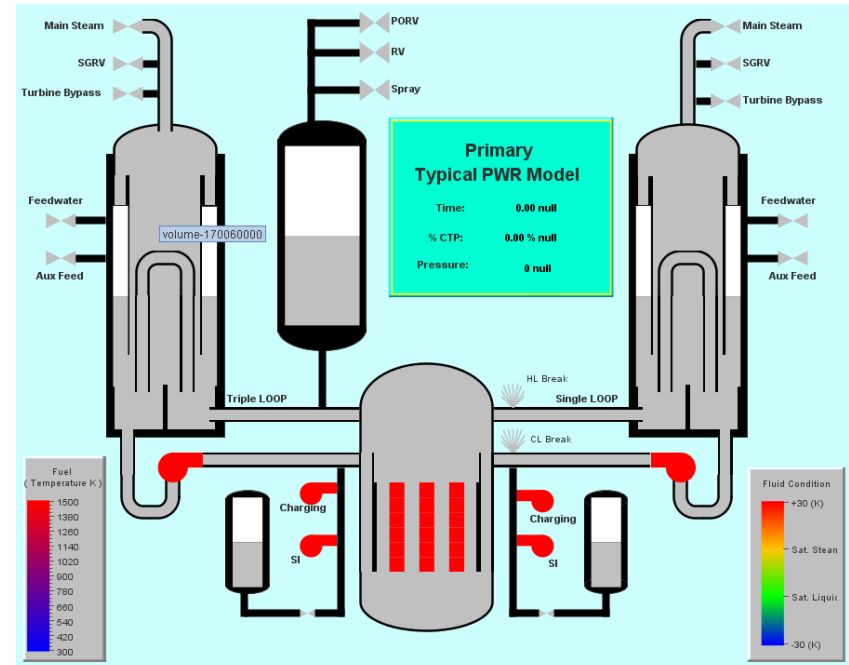
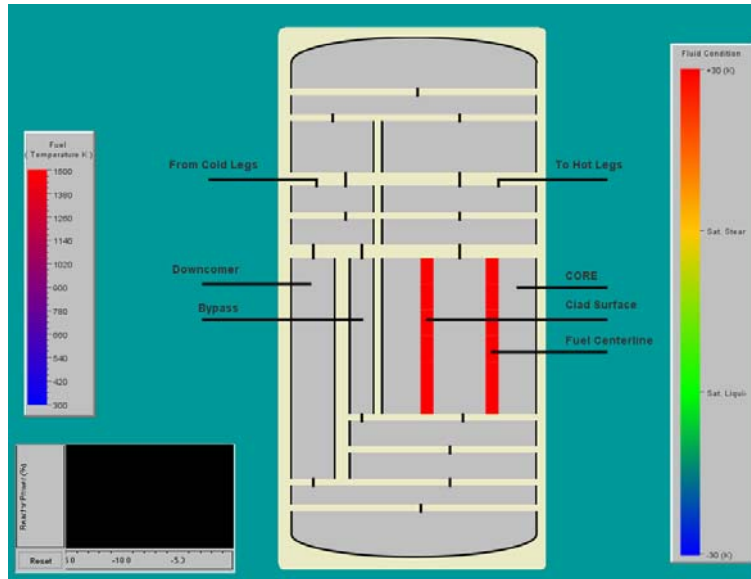
SNAP: Run-Time or “job control”

- Assists the user in running the analytical codes.
- Organizes the input and output files.
- Can run analytic codes on multiple machines and access them through a network.



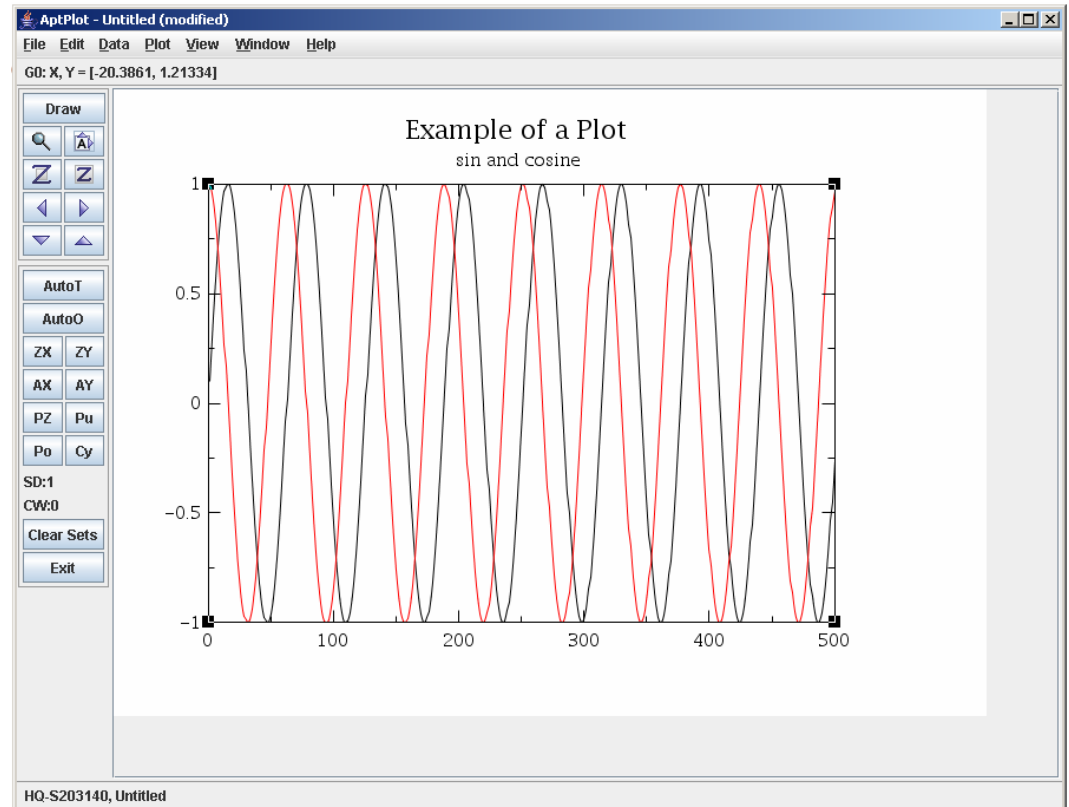
SNAP: Visualization Tool

- Visualization of data is handled through the “Animation” feature plug-in



SNAP: Plot Tool

- The APTPlot plot tool is integrated with SNAP
 - Can also be installed separately without “code” support
- Can be used to plot data directly from data files or from code output
- Written in Java and is easily installable
- Produces publication quality output (postscript, PDF, SVG, etc...)

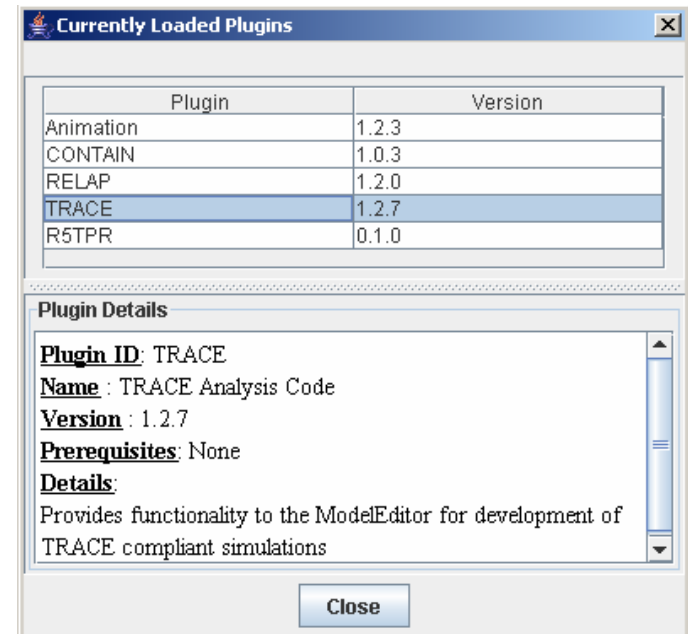


SNAP: Where? Supported Operating Platforms

- SNAP can be run on any platform that supports Java 1.5, including:
 - MS Windows (XP, Vista)
 - Apple/MAC OS X
 - Various Linux Platforms: Redhat, SUSE, etc...
 - Various Unix platforms: Solaris, HP-UX, IBM-AIX, etc...

SNAP: Extensibility

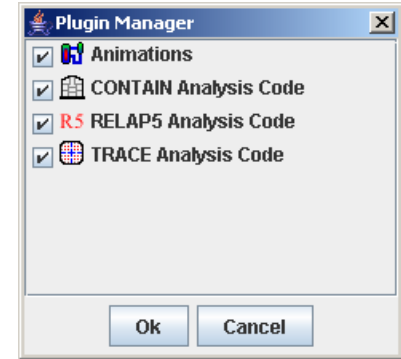
- The basic SNAP “core” GUI provides a basis for supporting many different analytical codes.
- Plug-in based architecture allows for extensibility to new/other analytic codes.
- A SNAP “code” plug-in is a program unit that, for a particular analytic code, encapsulates all user interface, input, output, and run-time features in one file.
- A SNAP plug-in can be “installed” by simply placing the plug-in file in the SNAP plug-in directory



SNAP: Extensibility (continued)

- Third party development of a plug-in is possible
 - SNAP Application Programming Interface (API) specification is freely available and makes extensive use of industry standard interfaces
- Several codes already have SNAP plug-ins available
 - TRACE
 - RELAP5 (and RELAP5-3D)
 - MELCOR 1.8.6
 - CONTAIN
 - COBRA

SNAP: Feature Plug-ins



- A SNAP plug-in can also implement a “feature” or extended capability that may or may-not be related to a specific analytic code
 - Animation plug-in: existing plug-in that provides for visualization of the output for various analytic codes or raw data.
 - Code conversion plug-in: various plug-ins exist that convert or assist in the translation of a model from one analytical code type to another (example: RELAP5 core to TRACE core mapping plug-in).
 - Macro plug-in: allows the user to run a user written script. Scripts can be very powerful tools for developing special functionality not already part of SNAP.

SNAP: Why Use it?

- Greatly reduces time to develop and/or modify analytic code models.
- SNAP simplifies the running of analytical codes.
- Permits model developers to graphically annotate and document their input models.
- Provides for quick and easy visualization of code results and/or data.
- SNAP graphical views can be saved in several standard file formats that can be edited in 3rd party applications and easily included in documentation.

SNAP: Who?

- Developed by the U.S. NRC
 - Office of Nuclear Regulatory Research
- Primary contractor:
 - Applied Programming Technologies, Inc.

SNAP: Where to get it?

- Available for download from:
 - <http://www.nrcsnap.com>
- Current “early release” version
 - Limited documentation
 - No Support
- SNAP version 1.0 is scheduled to be released in the Fall of 2007
 - Full set of documentation
 - Limited support

SNAP: Animation Examples

