

# *Containing COTS via Intelligent Software Wrappers*



*Jeffrey Voas*

*Chief Scientist*

*21515 Ridgeway Circle, Suite 250*

*Sterling, VA 20166*

*(703) 404-9293*

*jmvoas@rstcorp.com*

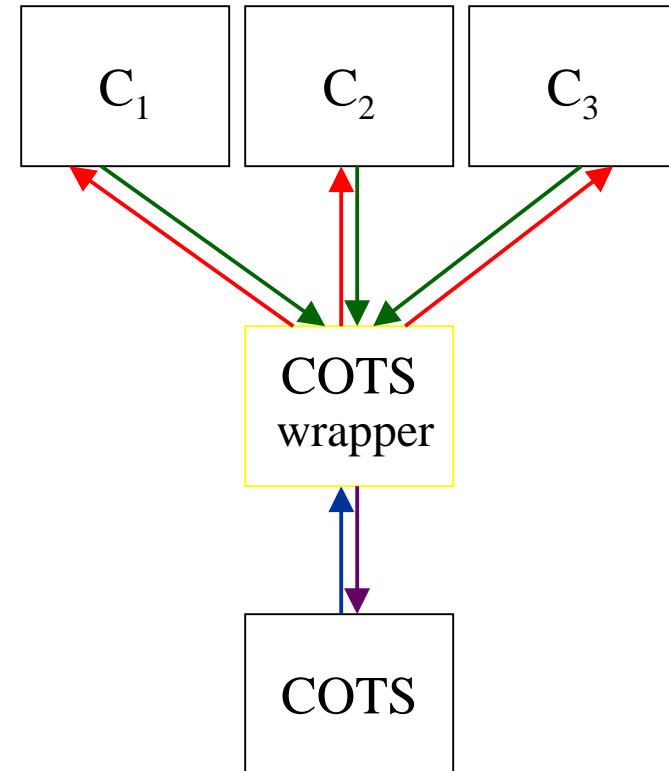
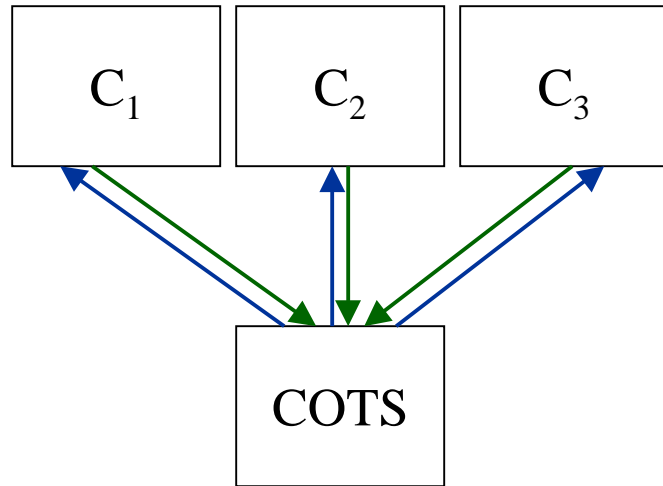
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# Wrapping

- **Goal:** Disallow components from exhibiting certain functionality by placing a software “net” around a component limiting what it can do
  - Two sub-goals: (1) Removing functionality, (2) Recovery
  - Two approaches: (1) Input wrapper, (2) Output wrapper
  - **Note 1:** Changes the interface to the system
  - **Note 2:** Complex and error prone, but probably the most plausible alternative

# COTS Component Wrapping



## WITHOUT WRAPPING

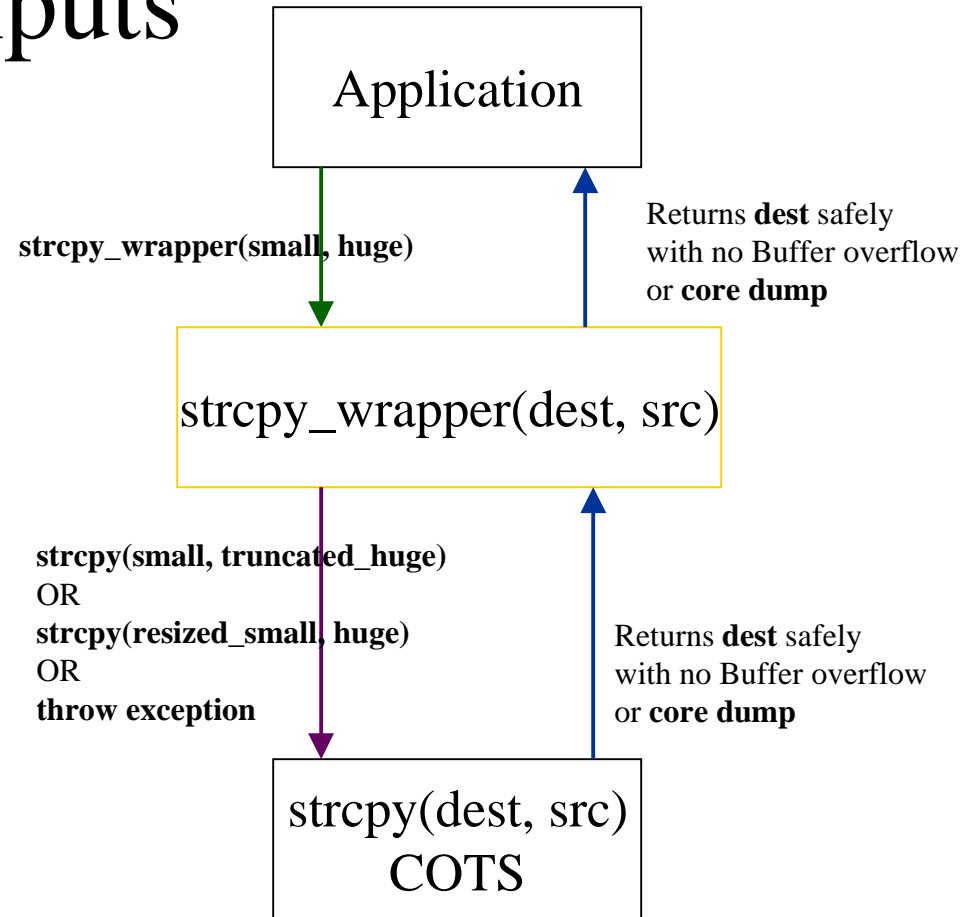
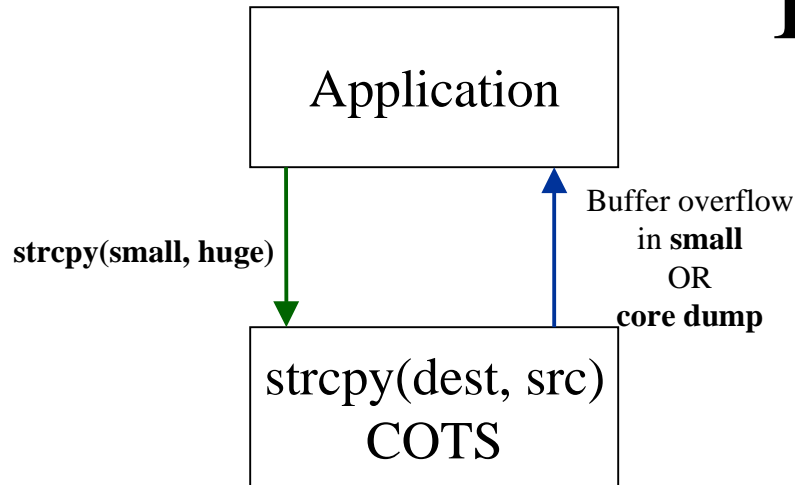
1. COTS inputs
2. COTS outputs

## WITH WRAPPING

3. SAFE inputs
4. SAFE outputs

# Wrapping Example: Monitoring

## Inputs



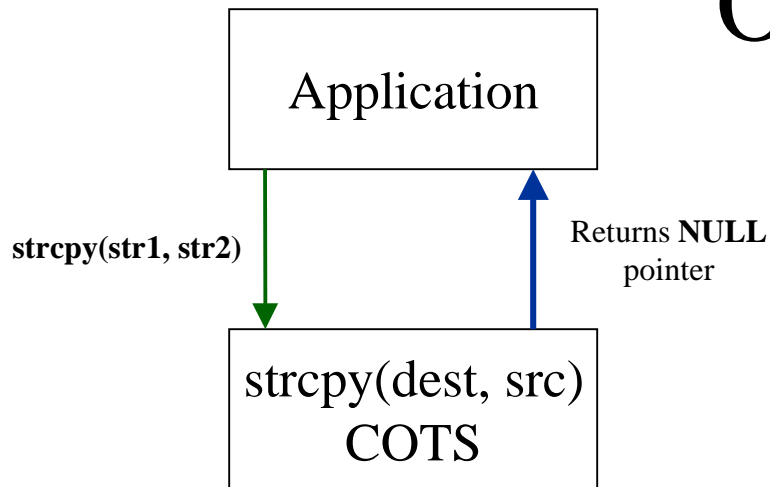
## WITHOUT WRAPPING

1. COTS inputs
2. COTS outputs

## WITH WRAPPING

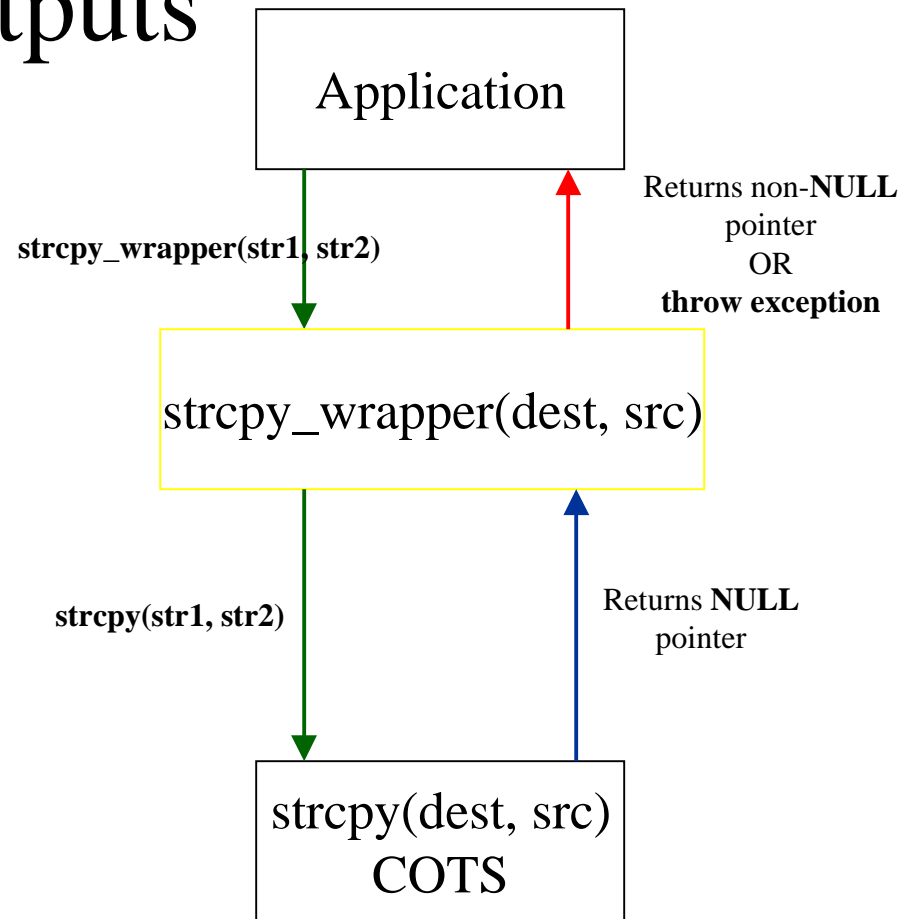
3. SAFE inputs

# Wrapping Example: Monitoring Outputs



**WITHOUT WRAPPING**

1. COTS inputs
2. COTS outputs



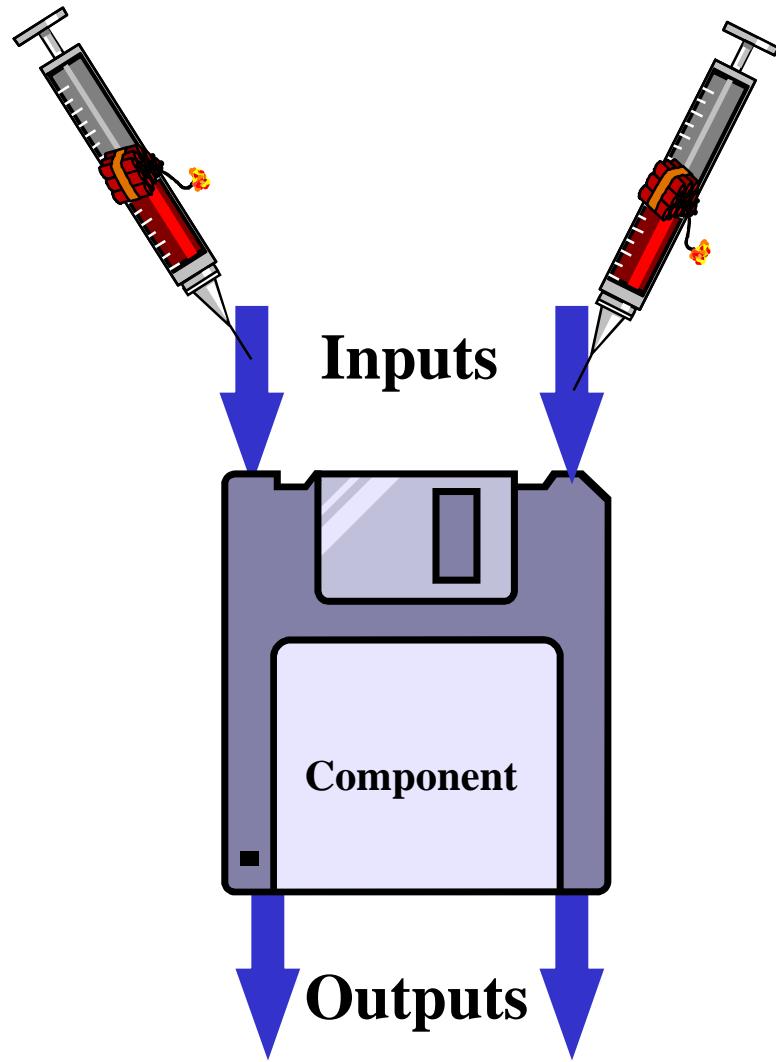
**WITH WRAPPING**

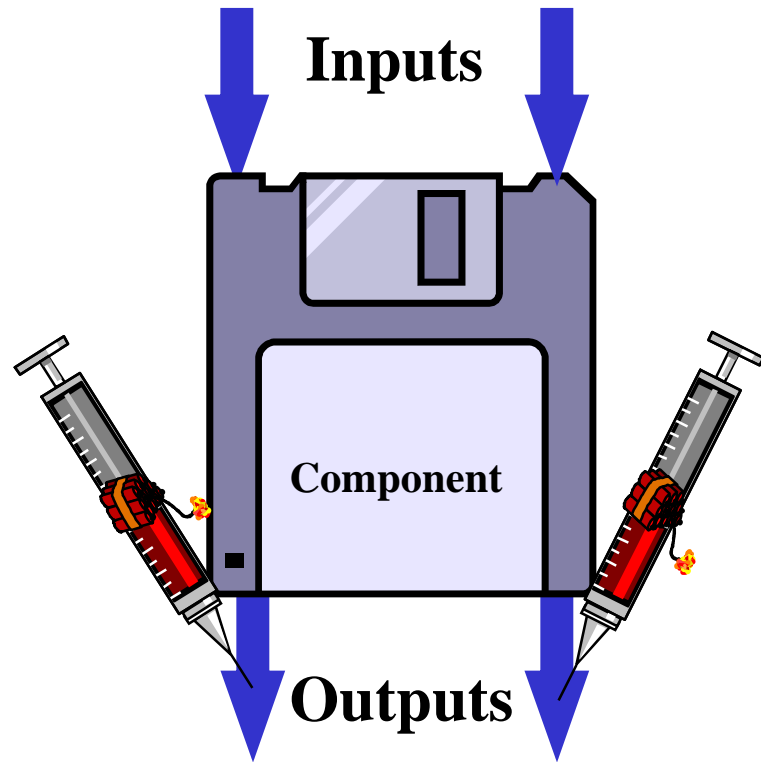
3. SAFE outputs

**But How Do You Know What Kind of a Wrapper  
to Build?**

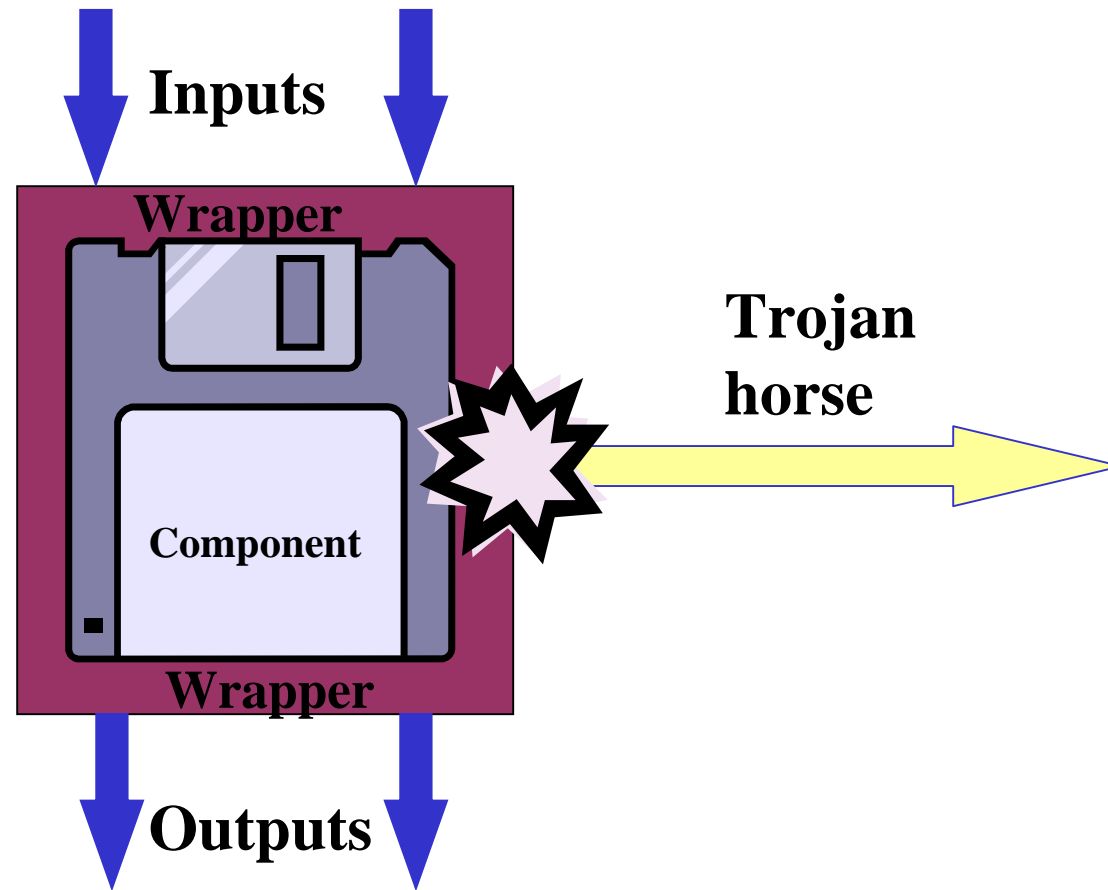
# Fault-Injection--Based Wrapper

*Applying fault injection methods to the states at the interfaces to the component to determine what states to prevent from entering/exiting the component*





.... But a Problem



**Test the Wrapper !!**

# The *Infamous* Excel Easter Egg

**Incidentally, you can have fun with a bit of software bloat if you have Excel 97. Open a new blank work sheet, press F5, and type X97:L97 in the "Reference" box, then click OK. Tab once. (You should end up in cell M97.) Press Ctrl+Shift while clicking once on the "chart wizard" icon (at the top with the blue-yellow-red bar chart) and you are now in the Excel Flight Simulator mode. Steer with the mouse, use the buttons to zoom in and out, and look for the monolith with the programmer credits. You can exit the screen by pressing Ctrl+Shift+Esc (or hit escape to quit, but then you must restart Excel).**

*[RichardFritzson<fritzson@cs.umbc.edu>, 16 May98.]*

# ... And Other Problems With Wrappers

*You are treating symptoms, not problem(s) !!*

*Wrappers can be complex and defective themselves*