Containers in CCA

What's here, What's possible, What we need to do

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Caveats:

- ❑ Discussion limited to in-process (possibly spmd, mpmd).

- ❑ Extension to RMI apps is not conceptually different, but…

  - ➢ The details could be ugly, for the hierarchical approaches.
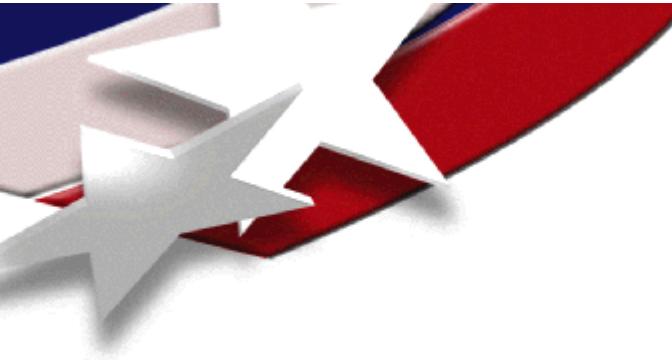
Container: group of components with details *hidden*

❑ Means: Pre-wire a set of components and export unwired ports to the *visible* world as if the set was a single entity.
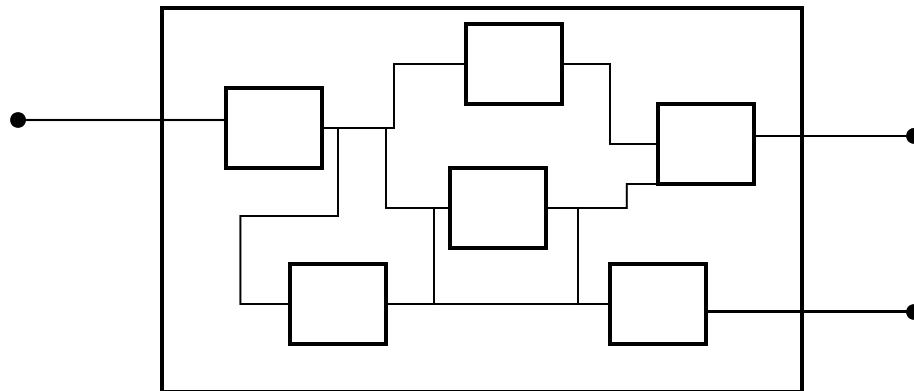
❑ Aim: simplify creation and understanding of complex applications.
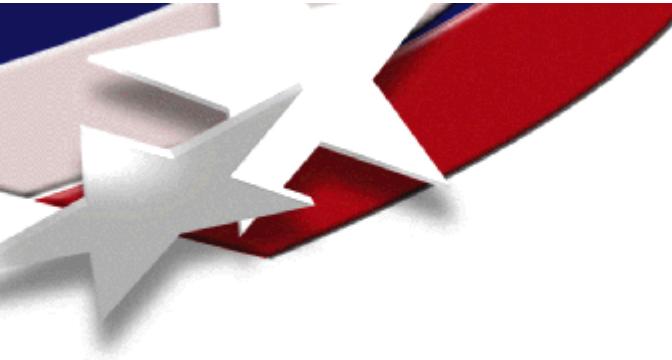
What's here

- Multiple source code routes to creation of applications from subassemblies that appear as components.

- Existing GUI(s?) *do not* support any of those routes.

- In-progress is a converter from application assembly script saved by ccafe-gui to stand-alone main() that is easily (but manually in the near term) converted to a component.

Q: What is the needed/desired approach?

❑ Several are available.

❑ Resources are limited– prioritize please, then volunteer.

❑ All require significant GUI development to make them genuinely end-user friendly.

❑ All are attractive targets for additional code generation tools to hide BuilderService details from graphically oriented users.

❑ Just what/kind how much of hiding do we *really* want, given that this is scientific programming and we ultimately need total control of parameter tuning?

A1: Cosmetics (virtual components)

- One-frame (flat component universe).

- GUI responsible for groupings and visibilities on a per user basis. Components/connections dynamically rendered. Think (Zoom+/Zoom-). *Don't think **ccafe-gui**.*

- Most powerful approach for end user, with right GUI.

- Multiple simultaneous views possible for large applications with distributed users.

- Canned subassemblies created via GUI scripts.

- No specification extensions required.

A2: Subassembly by a manager X

❑ One component, X, creates and connects a set of others ([Xsubs]), re-exports unconnected ports as its own.

❑ User needs to wire up X. No knowledge of [Xsubs].

❑ Retains one-frame view, but inflexible vs Answer 1.

❑ Ccafe-GUI gets cluttered when:

➢ Coder of X forgets to set visibility attribute on members of [Xsubs] component properties map.

❑ No specification extensions required, except to standardize interpretation of visibility property.
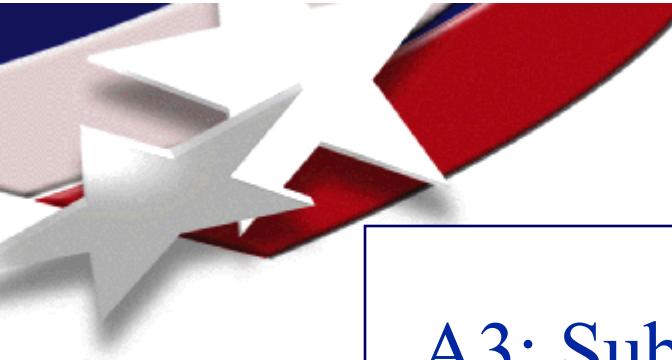
A3: Subassembly inside a component

- Must be orchestrated with help from non-CCA code which started the outermost AbstractFramework instance (frame) and supplies a clone frame to the container component, X_c. (See 2004 PPHEC paper).

- User needs to wire up only X_c. No [Xsubs] accessible.

- Hierarchical view, inner frames invisible.

- Ccafe-gui would be uncluttered (has no clue about the inner frame).

- Requires simple specification extension to eliminate non-CCA orchestration.
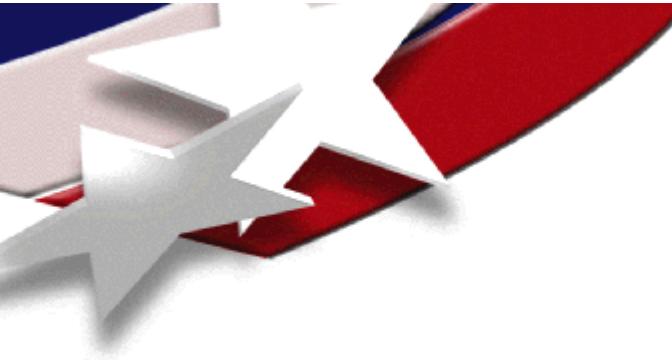
What's possible 1

❑ Tutorial could be expanded to include examples of approach 2.

❑ Tools could be created to automate generation of components that do approach 2 from ccafe-gui scripts.
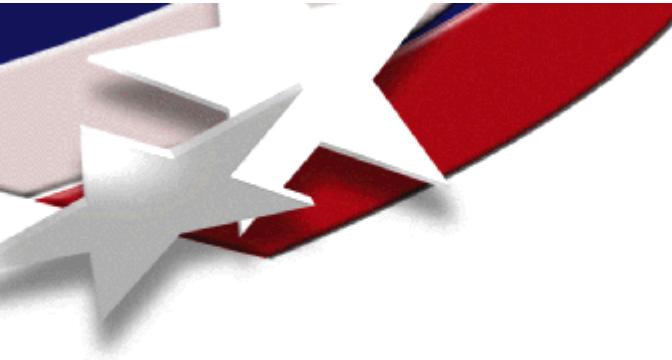
What's possible 2

- Specification could be extended to include visibility and other rendering properties for assemblies. No big changes to frameworks are required. Big GUI changes.

- Component could advertise that it wants to be a container by *providing* a new standard port. (exactly one inner-frame handle per component). I.e. a frame setter-port.

- Component could advertise that it wants to be a container by *using* a new standard port. (many or dynamic sub-frames per component). I.e. a frame getter-port.

- Could extend Services to provide an inner-frame handle registration protocol.
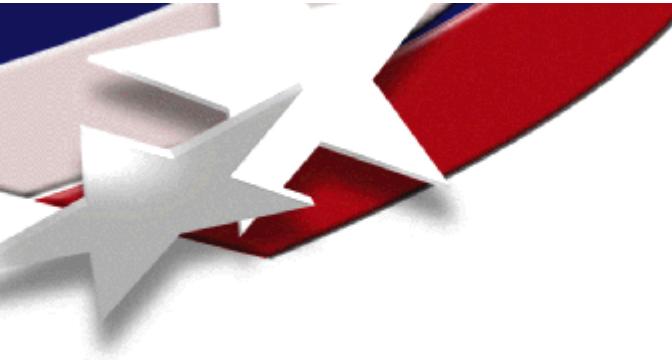
What we need to do

- ❑ Prioritize needs.

    - ➤ Is it better documentation, new specification details, or a rather different GUI?

        - ❖ Hiding means what?

        - ❖ Some GUI work is probably inescapable.

- ❑ Prioritize approaches.

    - ➤ If A3 first, specify the style of a component getting its inner-frame handles (Dei Causa, Eligete Quidquam!)
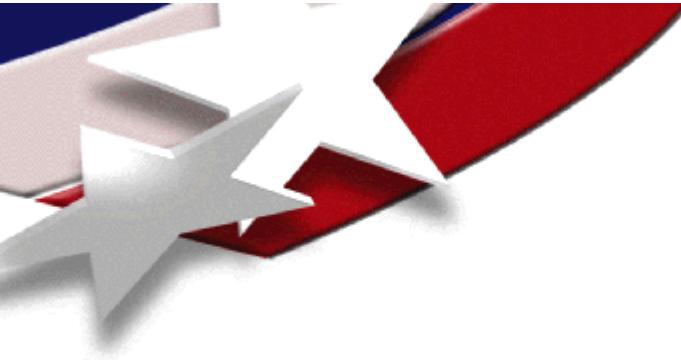
What we need to do (cont)

- ❑ Use CCARB to establish a working group on this topic chaired by someone who needs this capability and is willing to create support tools for it.

- ❑ Find funding– this is outside the specific deliverables for TASCS.