

Charter for the Earth Science Data Systems Reuse Working Group

Purpose

Under the auspices of NASA's Earth Science Enterprise, the Reuse Working Group will address technical issues as required to enable and facilitate reuse of software assets within the enterprise. The Earth Science Enterprise spends a significant amount of resources developing software components that may have value beyond the particular program or project for which they were developed. The Reuse Working Group is chartered to oversee the process that will maximize the reuse potential of such components in order to:

- (1) Drive down the cost and time of system development, and reduce/eliminate unnecessary duplication of effort;
- (2) Increase flexibility and responsiveness relative to Earth science community needs and technological opportunities; and
- (3) Increase effective and accountable community participation.

To that end, the Working Group will recommend and support activities that help increase awareness of available components, increase awareness of the value of reuse, provide needed processes and mechanisms, disseminate successful reuse strategies, and address related intellectual property and policy issues. The Working Group will consider a variety of approaches to enabling reuse to help meet differing needs and priorities across various Earth science systems.

Goals

The goals of the Reuse Working Group are

- To participate in the execution and evolution/perfection of the approved reuse process under the auspices of NASA ESE
- To demonstrate the feasibility and value of reuse through focused projects
- To increase the supply and availability of reusable assets
- To make recognizable and easy-to-evaluate candidate reuse solutions
- To minimize the cost of infrastructure needed to support the community's reuse activities
- To increase community capacity and interest to reuse existing assets
- To contribute to the removal of existing barriers to reuse
- To recommend incentives to encourage reuse

Scope

The scope of the Reuse Working Group should be limited to the following

- Facilitating reuse across projects and not interfering with local control of participating systems,
- Focusing on reuse processes (related to the reuse of existing operational assets in similar operational contexts) and not on technology infusion processes (related to the first-time use of an asset in an operational environment),
- Focusing on reuse of existing assets
- Reusability of newly developed assets
- Focusing on software code but also considering other software development artifacts (such as architectures, software designs, system configurations, ICDs, test plans, etc.) and other types of reusable digital assets
- Focusing on reuse of proven operational and NASA-ESE specific software assets,
- Acting as liaison to other NASA ESE Working Groups, especially the Standards Working Group (by recommending relevant standards to focus on, based on the reuse needs of the community, and by enabling and supporting the augmentation of heritage software to support standards approved or proposed by the Standards Working Group).

Membership

The Reuse Working Group shall be composed of part time support staff from NASA ESE, ESE system awardees (e.g. REASoN CAN), ESE mission projects, ESE science data providers, and other agency and university participants. Membership in the Working Group should be open to anyone interested in contributing to the purpose of the group, and should consist of a mix of users, contributors and persons previously involved with successful reuse attempts. The Working Group should include a mix of system and software developers (one representative for each project involved in a formal reuse activity) and high-level managers (particularly those aware of or involved in multiple development projects).

Responsibilities

The responsibilities of the Reuse Working Group span the following activity areas

- (1) Overseeing the execution and evolution/perfection of the approved reuse process under the auspices of NASA ESE,
- (2) Performing cost-benefit trade analysis prior to making activities recommendations to NASA ESE,
- (3) Providing technical consultation, as required, in reuse implementation projects and other efforts that directly result in the publication or use of reusable components including the registration and categorization of reuse components. This also includes identifying and working with experts from both the Mission-Critical and the Mission-Success communities,
- (4) Providing technical consultation, as required, in reuse incentive activities (awards and structural changes that directly and indirectly encourage reuse and incentivize the participants to go beyond their usual boundaries),
- (5) Leading outreach and education activities and sponsoring efforts that increase community awareness and understanding of reuse benefits, pro-actively foster cooperation within the community, communicate success to appropriate parties, as well as facilitate the exchange of best practices, lessons learned, tools, available components, etc.,
- (6) Providing technical consultation, as required, in support and enablement reuse activities which include supporting infrastructure building efforts and other mechanisms needed to enable reuse (tools, metadata mining, etc), defining processes for establishing requirements or recommendations for making components reusable,
- (7) Contributing to policy change activities, especially those related to reducing policy barriers to reuse.

Metrics

Metrics are needed to track the progress of the Working Group and to identify areas where additional support may be needed. Reuse-related metrics should be outcome-oriented such that they measure the benefits of reuse and not only the amount of reuse accomplished. Potential metrics that need to be developed and published include

- Number of components actually reused
- Number of problems solved by reusable assets (case studies)
- Ratio of components actually reused to the total number of identified reusable components available
- Cost savings (or estimates) attained by reuse
- Capabilities enabled/facilitated by reuse
- Schedule and cost savings