

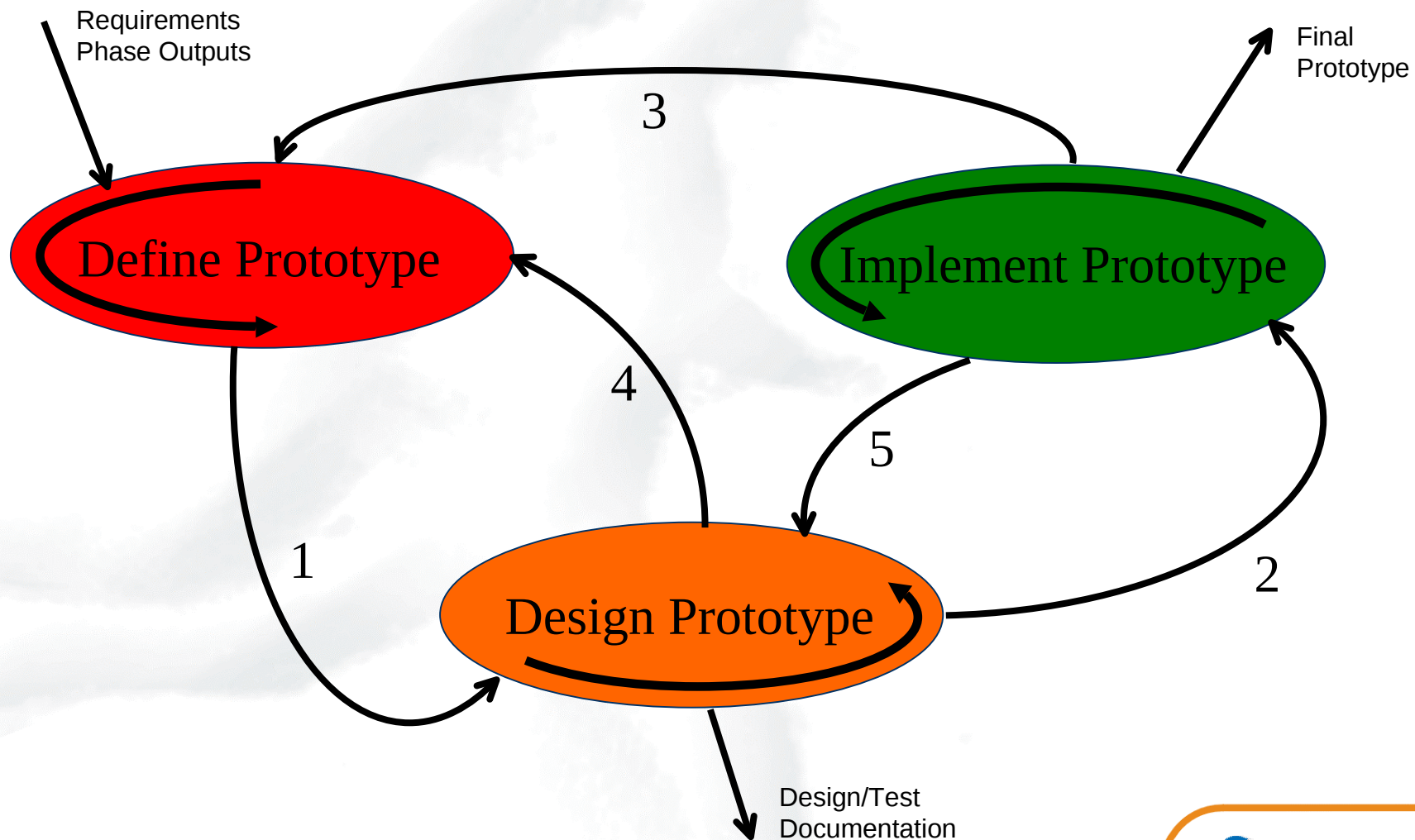


SSL Background: GRID Activities

- SSL is a leading European Software Systems House with many years of Space experience both inside and outside ESA.
 - Expertise includes integrated ground infrastructure
 - Its Non-Space divisions routinely implement corporate networks
- SSL is currently lead contractor for a UK Space Programme tasked with assessing the relevance of GRID Technologies.
- Programme addresses construction of GRID demonstration platform based on:
 - small network of Intel/Linux machines
 - Globus 1.1.4 - MPICH enabled (message passing)
 - SSLEAY 0.9.0.b - secure sockets layer
 - OPEN LDAP 1.2.7 - data access protocol
 - CONDOR 6.3 0 - job scheduler
- use of TOP-C for GEANT4 parallelisation
- examination of distributed data technologies



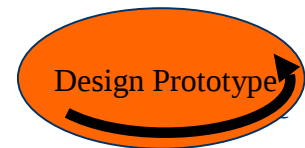
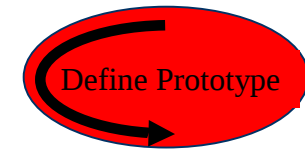
SSL Prototyping Prototype Development Lifecycle





SSL Prototyping Prototype Development Lifecycle

- **Define Prototype** : requirements for next iteration of prototype are defined based on feedback from evaluation of previous implementation (3), the existing design (4) and outputs from the requirements phase
- **Design Prototype** : design is updated based on the requirements for the next iteration of the prototype (1) and knowledge of the existing implementation (5)
- **Implement Prototype** : prototype software is developed based on the latest design (2) and demonstrated to the domain experts to illicit feedback
- Final iteration of Design and Implementation produces the design/test documentation and the final prototype software





SSL Prototyping Prototype Development Lifecycle

Advantages:

- core requirements implemented early, prototype is then expanded and refined as understanding grows
- feedback from domain experts (5) reduces the scope for the development to drift away from their real needs
- allows development to change direction based on new discoveries associated with a particular prototype i.e. requirements focus may change as understanding increases

But care is needed:

- important that each iteration of the prototype is bounded by a well defined set of goals (1) so that each iteration builds on previous prototype in the direction of the finished product
- strong Configuration Management is needed to control rapidly changing software



Space Research Prototype Focus

“Application of GRID based computational power”

Functionality of interest in Spacecraft Plasma domain:

- partitioning/parallelisation of spacecraft-plasma interaction model

Functionality of interest in Radiation Transport domain:

- parallelisation of a Geant4 application:

Functionality of interest to both domains:

- integration with GRID based computing power (LCMPP)
- optimised usage of distributed computing resources
- collating data from simulation
- configuration management of analysis models and analyses
- scalability analysis to determine maximum possible speedup which might be obtained



Solar System Research Prototype Focus

“Cross Mission data analysis, manipulation & comparison”

Functionality of interest in this domain:

- uniform access to distributed data archives, use of XML
- remote execution of distributed queries
- data manipulation
- data analysis and visualisation
- comparison of real and simulated data sets
- long term maintenance of data