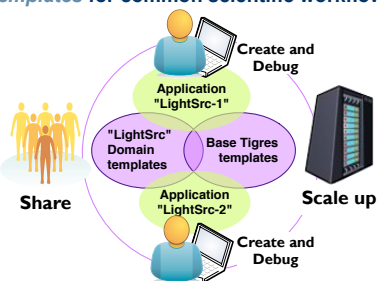
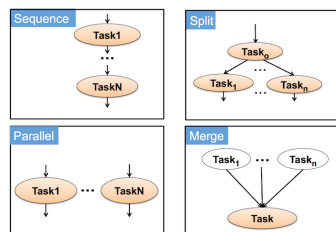


## Tigres: A Template Based Workflow Library

Design *templates* for common scientific workflow patterns



- Enable data analysis to work seamlessly between desktops and large-scale systems
- Embedded in existing languages such as Python and C
- Light-weight execution framework coupled with monitoring, provenance, failure recovery
- Use of User-Centered Design Process

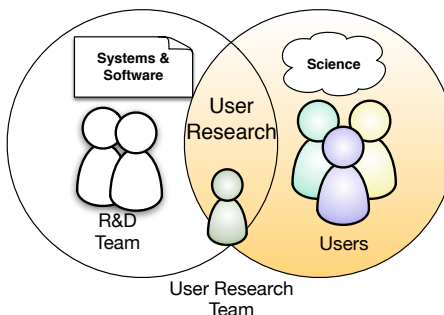


## Research Scope

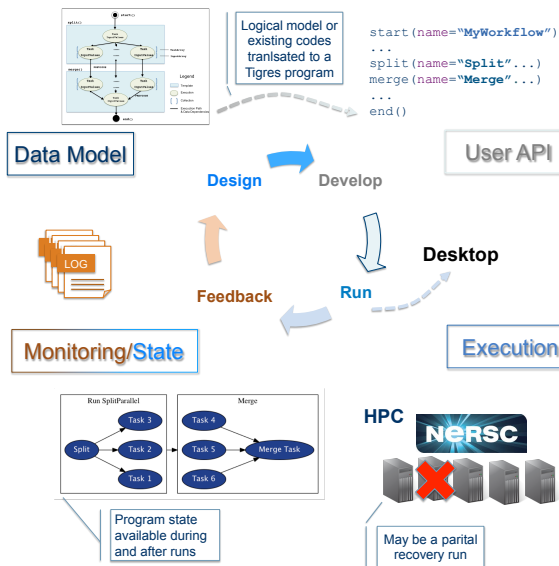
- Programming interface to support iterative workflow development over a range of different resources
- Optimize execution semantics on HPC systems
- Provenance and monitoring at scale
- Usability processes for API design and development

<http://tigres.lbl.gov>

## User Research Approach to Workflows

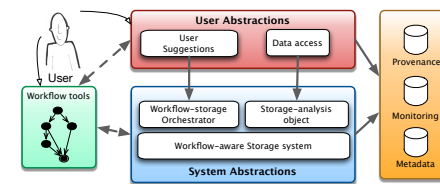


## Iterative Workflows



## Usable Data Abstractions for Next-Generation Workflows

Enable large-scale data analytics workflows on exascale systems



Workflow tools are going to be critical at exascale

- Data movement costs increasing due to power and performance
- Memory scaling and I/O bandwidth is limited compared to compute capacity
- Reliability needs to be considered at scale.

To build next-generation workflow infrastructure we need to:

- Thoroughly understand scientific workflows
- Support diverse types of analysis processing modes on exascale hardware
- Balance usability factors with efficiency required on exascale hardware
- Provide infrastructure to account for reproducibility

## Research Scope

- Usability and Ethnographic Studies (UW, LBL)
- User-level data abstractions (LBL, UC)
- System-level data abstractions (ORNL)
- Provenance (ORNL, LBL)

<http://uda.lbl.gov>  
<http://udablog.lbl.gov>