DICE Parallel File Systems Benchmarking and Evaluation
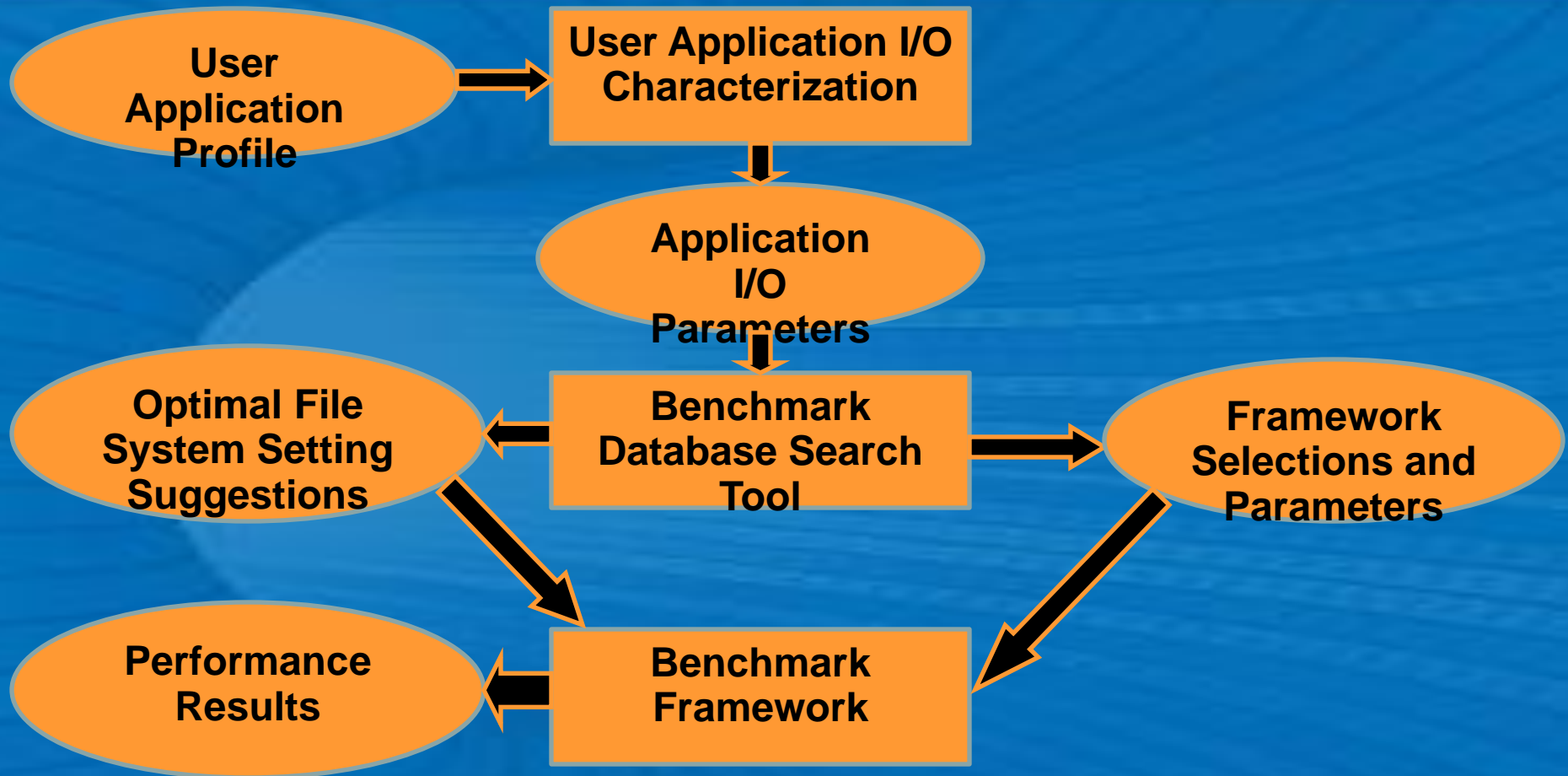
Paul Buerger

pbuerger@avetec.org

Goals

- **Parameterized Benchmark Suite**
  - **Simulate many different workloads**
  - **Expose more tuning/configuration options in the benchmarks**
  - **Suite Extensible so users can add new benchmarks**
  - **Have unique benchmarks for synthetic workloads**
    - **Transactions**
    - **Streaming**
    - **Random I/O**
    - **Various Read/Write Ratios**
- **Normalization is needed between differing architectures**
  - **Need a formula**
  - **Aging and fragmentation of data should be considered**

Benchmarking Framework and Methodology

Part 1:
I/O Characterization

- **DICE Collecting Trace and Benchmark results**
- **Parsing results to identify patterns**
- **First step to using the DICE Framework**
  - **I/O Characterization of application or workload**
  - **DICE will generate a catalogue of I/O characterizations based on inputs**
  - **Users can provide traces, select a similar pattern/workload, or provide their known parameters**

Part 2:
Database Search Tool

- **DICE will create a searchable database**
- **Will provide Benchmark Framework with**
  - **Ideal benchmarks to target selected metrics**
  - **Parameter settings based on I/O characterization of applications**
  - **Will also provide some suggested optimization parameters based on previous performance data**

Part 3:
Benchmark Framework

- **In depth Framework tool to evaluate file systems**
- **Parameters passed to it from the search tool**
- **Will have list of potential benchmarks available to use**
- **Will be extensible to add new ones as needed**
- **Will include any DICE developed benchmarks for key file system criteria**

How to participate

- **Survey**
  - **http://questionweb.com/51082**

- **Web upload site**
  - **http://webproj.usa40.net**