FIRST Project: Paradyn Week 1999

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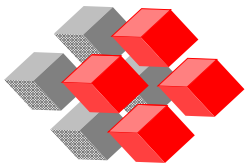

Introduction to the FIRST Project

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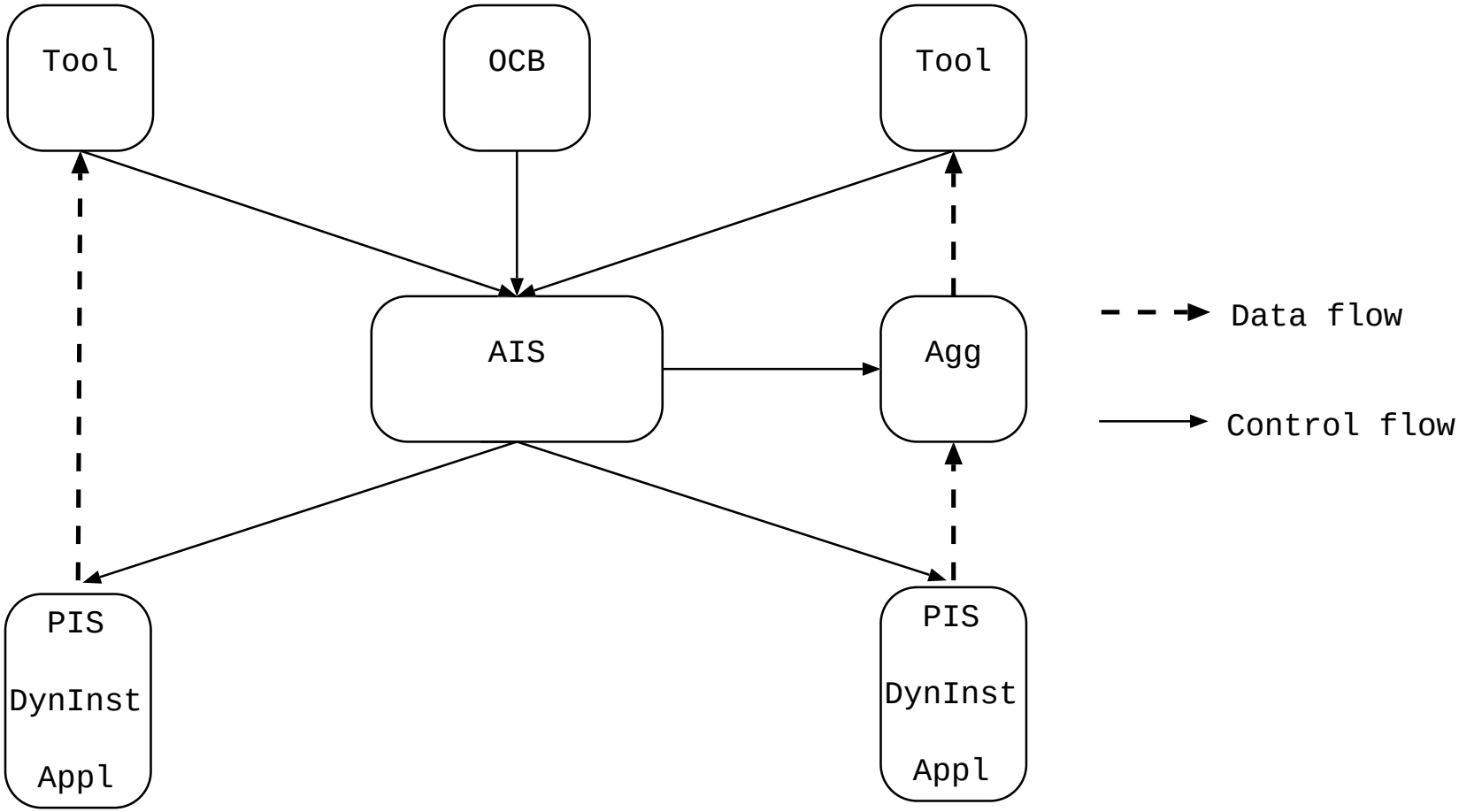
FIRST Aims

- Develop extensible OO framework for software tool development
- Present unified view for parallel or distributed applications
- Utilise standard components (CORBA, PTR, DynInst)

FIRST Architecture



Standards

- CORBA: for portability
- DynInstAPI: for instrumentation
- Portable Timer Routines: for timers

Selected PIS IDL

```
void PIS_InsertCounter ( ... );
void PIS_InsertTimer ( ... );
void PIS_InsertTrace ( ... );
```

Selected AIS IDL

These functions are at a slightly higher level and contain additional parameters to specify which processes on which processors the instrumentation should receive the request.

```
void AIS_CountFn ( ... )
void AIS_TimeFn ( ... );
void AIS_TraceFn ( ... );
```

Object Code Browser (OCB)

The OCB presents a GUI view of the modules and functions in an application. When a function is selected using the mouse, the AIS is informed and it selects this function as the next one to use for instrumentation.

The function-list parameters on many of the AIS interfaces are optional, so when they are empty, the AIS uses the most recent values it received from the OCB.

This enables tools to concentrate on the functionality of requesting instrumentation.

Sample tools (1)

The following classes of tool are envisaged as being possible using this architecture:

- Performance Profiler: initially those that deal with counts and timers.
- Debugger: restricted by the granularity supported by Dyninst.
- Tracer: consistency of timestamp from one processor to another would need to be addressed.

Sample tools (2)

- Memory Checker: calls to free, malloc, etc can be instrumented.
- Complexity analyser: there are s/w metrics that could be used, based on object code rather than source.
- Test Coverager: for checking coverage of test suite or for detecting ”dead” code.