



Figure 2: Operation Servicing State Machine (w/nested core state machine)

initialization state. Each operation may have a different initialization phase, but at the very least, the source and target endpoints for the Flow (to be performed inside the nested state machine) are selected. Following initialization, the nested state machine is executed, performing the core operation requested. After this, the operation state machine checks the status of the performed operation to properly handle error reporting. Finally, the state is advanced to the initial state of the state machine, which is the default action when the operation has completed.

In order to represent the core functionality of a System Interface method as a re-useable state machine, we must take advantage of the source and target endpoint specifications allowed by the existing *Flow Interface*. Assuming it is possible to know the source and target endpoints of the Flow prior to executing the System Interface core functionality, it can be re-used by embedding it as a nested state machine in the pvfs2-client architecture, *and* shared between the blocking and non-blocking System Interface implementations. The requirement for this is that the source and target endpoints of the Flow be established before using the core functionality state machine. In Figure 2, for example, the pvfs2-client application may specify that the Flow's target endpoint should be the /dev/pvfs2 device node.

6 Non-blocking and Blocking System Interface Implementations

Non-blocking and blocking System Interface methods (as shown in Figure 3) can use the same core functionality once implemented as a state machine. The blocking version will manually advance the state machine internal to the call and not return until the operation has completed. The non-blocking implementation will start the state machine and offer a mechanism for testing operation completion. For the non-blocking interface, some method of asynchronous progress must be provided. This can be done either with a background thread, or completing work during a test for completion.