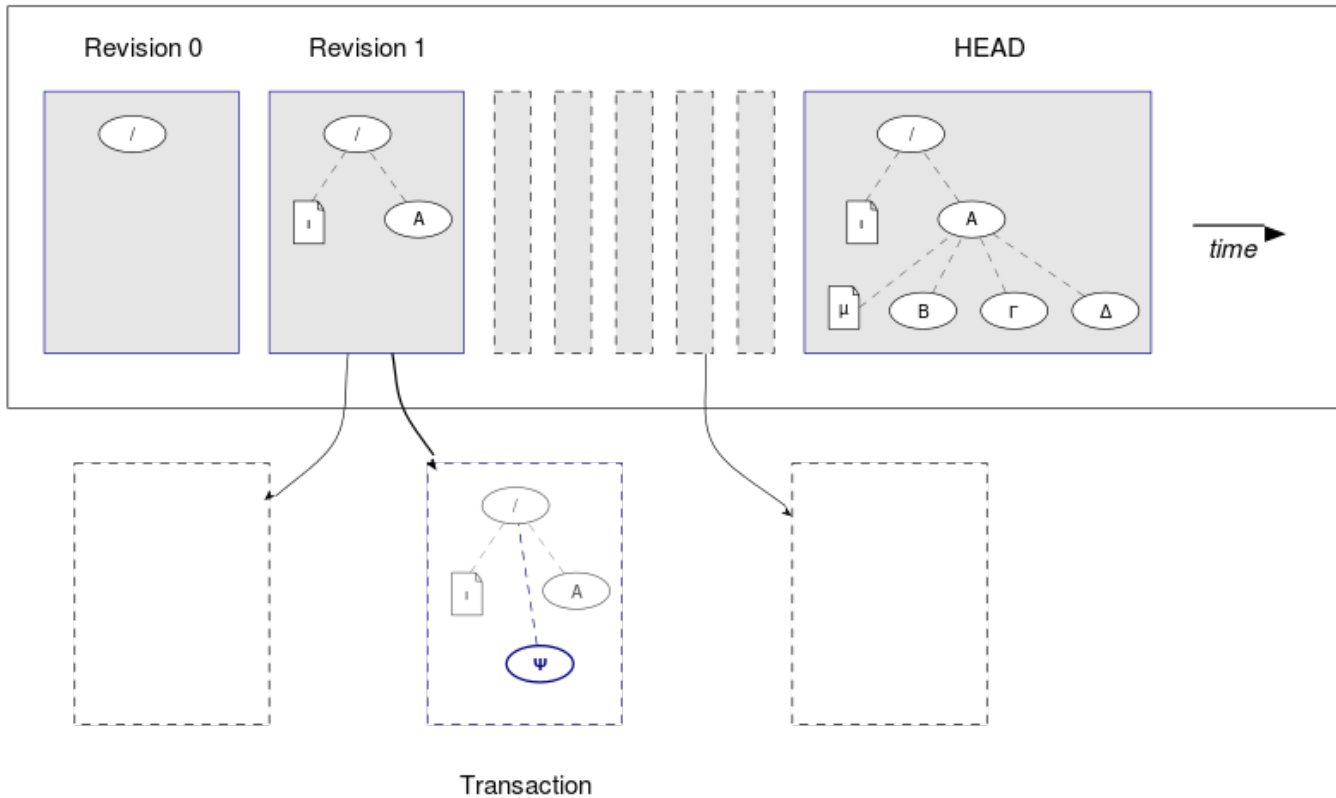


FS2 Design

The Versioned Filesystem

Subversion's versioned filesystem is a temporally ordered sequence of discrete snapshots of the state of a tree of nodes. These immutable snapshots are called *revisions*. The initial revision (*Revision 0*) contains exactly one node, the *root directory*. The last, or *youngest* revision, is called the *HEAD*.

Beside this sequence of immutable revisions, the filesystem can contain an arbitrary number of *transactions*, which are mutable snapshots that have no successors and whose predecessors (*base revisions*) are immutable. The only way to create a new revision is to *merge* the *tree mutations* described by a transaction into the HEAD tree and append the result to the revision sequence, thereby creating a new HEAD (in other words, *rebase* the transaction to HEAD and make it immutable).



<<EmbedObject(fs2-tree-view.svg)>>

Nodes are either *files*, which are containers of unstructured data, or *directories*, which are lists of named files and directories. The root node of this tree is always a directory.

Within any single revision, each node (except the root) will have exactly one parent. However, successive revision trees are not independent and a node may trace its *history* across many revisions. A *node revision* is the projection of one *branch* of a node's history in a particular revision; it can have at most one *predecessor* in an earlier revision and any number of *successors* in later revisions.

For example, in the following diagram we have four *revisions* of the node tree containing 15 *node revisions*, but only 4 distinct *nodes*:

[vfs-node-history.svg](#)]]