ABSTRACT: With the increasing storage capacity of personal computing devices, the problems of information overload and information fragmentation become apparent on users' desktops. For the Web, semantic technologies aim at solving this problem by adding a machine-interpretable information layer on top of existing resources, and it has been shown that the application of these technologies to desktop environments is helpful for end users. Certain characteristics of the Semantic Web architecture that are commonly accepted in the Web context, however, are not desirable for desktops; e.g., incomplete information, broken links, or disruption of content and annotations. To overcome these limitations, we propose the sile model, an intermediate data model that combines attributes of the Semantic Web and file systems. This model is intended to be the conceptual foundation of the Semantic Desktop, and to serve as underlying infrastructure on which applications and further services, e.g., virtual file systems, can be built. In this paper, we present the sile model, discuss Semantic Web vocabularies that can be used in the context of this model to annotate desktop data, and analyze the performance of typical operations on a virtual file system implementation that is based on this model.