High-performance storage systems face increasingly critical metadata management challenges, especially in the approaching exascale era. These challenges arise not only from exploding metadata volumes but also from increasingly needs on diverse metadata types, which include the data provenance and user-defined attributes in addition to traditional POSIX metadata. This ``rich" metadata is critical to support many advanced data management functionality such as scientific results reproducing, data auditing and results validation, etc.

In this research, we focus on building a prototyped graph-based management system to uniformly manage such rich metadata. Our goal is to provide both richer semantics and better performance comparing to currently prevalent POSIX metadata management system. In this specific talk, I will introduce the basic concept of graph-based metadata and our recent progress. The future direction and potential research directions will also be discussed.