

Technical Recommendation for usage of UUIDs in SC4 standards

ISO TC184 SC4 Ad hoc Group 3 (AhG 3)

Unique Universal Identifiers (UUIDs) are numbers generated by a computer that are unique for most practical purposes¹. Therefore, computer applications can use them as synthetic keys to find items. The primary advantage of a UUID is that it can be generated by any application at any time. The primary disadvantage is that once the connection between an item and its UUID is lost, it cannot be repaired.

For many years SC4 has been developing standards in which internal identifiers (usually integers) connect data items. Internal identifiers are much smaller (8 bytes) than universal identifiers (128 bytes). The SC4 standards could replace their internal identifiers with universal ones, but as yet, this is not practical, because the data would have to be understood within the standard, which implies all SC4 standards (and all other standards) would have to be harmonized.

Therefore, AhG3 recommends UUID's are used as an external reference between data defined by standards. For example, an external reference between a STEP data item and a QIF data item. The difficulty with this scheme is finding a system that can interpret the data once located. Various schemes have been proposed, including at least two for ISO 10303. The conflict on which scheme is best has led to three years of discussion.

Fortunately, a W3C protocol has recently become available to define how to interpret the located data. Decentralized Identifiers, better known as DiD's, allow for the method to be specified as part of the identifier. Thus, for example, the conflict within ISO 10303 can be resolved by the following DiD's. The first DiD being used to connect data in a digital thread. The second DiD being used to archive data for a CAD application. The third DiD shows how the same convention can be extended to data that has a QIF encoding. The data that follows the colon depends on the protocol and maybe a UUID as shown.

did:thread:step: 0d7b99ce-e079-4db8-9559-30e60b131e4a

did:archive:step: ad62d1c1-3371-4431-9918-40f91cf9f53f

did:thread:qif: 059ce9f7-50a1-4cde-a478-477c45f718a1

NOTE 1: The additional data in front of the colons need not be required if it can be assumed by the context.

Note 2: The protocol identified by the labels may include a mechanism to recover lost connections.

In summary AhG3 recommends that each working group selects its own protocol. In particular, WG15 should develop UUID's for the digital thread under the "thread" prefix, and WG12 should develop UUID's for data archiving under the "archive" prefix. The former can be defined in ISO 23247, and the latter can be defined in ISO 10303.

¹ There are more UUID's than stars in the universe, though possibly not more than parts in the DoD database.