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Inheritance rules for Hierarchical Metadata Based on ISO 19115

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Mainly, ISO19115 has been used to describe metadata for datasets and services. Furthermore, ISO19115 standard (as well as the new draft ISO19115-1) includes a conceptual model that allows to describe metadata at different levels of granularity structured in hierarchical levels, both in aggregated resources such as particularly series, datasets, and also in more disaggregated resources such as types of entities (feature type), types of attributes (attribute type), entities (feature instances) and attributes (attribute instances).

In theory, to apply a complete metadata structure to all hierarchical levels of metadata, from the whole series to an individual feature attributes, is possible, but to store all metadata at all levels is completely impractical. An inheritance mechanism is needed to store each metadata and quality information at the optimum hierarchical level and to allow an ease and efficient documentation of metadata in both an Earth observation scenario such as a multi-satellite mission multiband imagery, as well as in a complex vector topographical map that includes several feature types separated in layers (e.g. administrative limits, contour lines, edification polygons, road lines, etc). Moreover, and due to the traditional split of maps in tiles due to map handling at detailed scales or due to the satellite characteristics, each of the previous thematic layers (e.g. 1:5000 roads for a country) or band (Landsat-5 TM cover of the Earth) are tiled on several parts (sheets or scenes respectively).

According to hierarchy in ISO 19115, the definition of general metadata can be supplemented by spatially specific metadata that, when required, either inherits or overrides the general case (G.1.3). Annex H of this standard states that only metadata exceptions are defined at lower levels, so it is not necessary to generate the full registry of metadata for each level but to link particular values to the general value that they inherit. Conceptually the metadata registry is complete for each metadata hierarchical level, but at the implementation level most of the metadata elements are not stored at both levels but only at more generic one.

This communication defines a metadata system that covers 4 levels, describes which metadata has to support series-layer inheritance and in which way, and how hierarchical levels are defined and stored. Metadata elements are classified according to the type of inheritance between products, series, tiles and the datasets. It explains the metadata elements classification and exemplifies it using core metadata elements. The communication also presents a metadata viewer and edition tool that uses the described model to propagate metadata elements and to show to the user a complete set of metadata for each level in a transparent way. This tool is integrated in the MiraMon GIS software.