### ISSUE 472: quantification of P169, P170, P171, P172

**DECISION**: The sig reviewed the cardinalities for properties P169, P170, P171 and P172.

* The cardinality of P169 defines spacetime volume [D: E95 Spacetime Primitive; R: E92 Spacetime Volume] is set to (1,1:0,n)
* the cardinality of P170 defines time [D: E61 Time Primitive; R: E52 Time-Span] is (0,1:0,n) (according to the decision reached in the context of issue 459; reviewing of figure 3)
* the cardinality of P171 at some place within [D: E53 Place, R: E94 Space Primitive] is (0,n:0,n)
* the cardinality of P172 contains [D: E53 Place, R: E94 Space Primitive] is (0,n:0,n)

**DECISION**: the sig edited the scope note of P171 while going through the quantification properties. The full path of P171 was edited and the definition of the property changed

#### FROM (old)

**P171 at some place within**

Domain: [E53](#_E53_Place) Place

Range: [E94](#_E94_Space_Primitive) Space Primitive

Scope note: This property describes the maximum spatial extent within which an instance of E53 Place falls. Since instances of E53 Places may not have precisely known spatial extents, the CIDOC CRM supports statements about maximum spatial extents of E53 Places. This property allows an instance of an instance of E53 Places’s maximum spatial extent (i.e. its outer boundary) to be assigned an E94 Space Primitive value.

*P171 at some place within* is a shortcut of the fully developed path *E53 Place, P89 falls within, E53 Place, P168 place is defined by, E94 Space Primitive* through a not represented declarative Place as defined in CRMgeo (Doerr and Hiebel 2013) to a Space Primitive

Examples:

the spatial extent of the Acropolis of Athens (E53) is *at some place within* POLYGON ((37.969172 23.720787, 37.973122 23.721495 37.972741 23.728994, 37.969299 23.729735, 37.969172 23.720787)) (E94)

In First Order Logic:

P171(x,y) ⊃ E53(x)

P171(x,y) ⊃ E94(y)

#### TO (new)

**P171 at some place within**

Domain: [E53](#_E53_Place) Place

Range: [E94](#_E94_Space_Primitive) Space Primitive

Scope note: This property describes the maximum spatial extent within which an instance of E53 Place falls. Since instances of E53 Places may not have precisely known spatial extents, the CIDOC CRM supports statements about maximum spatial extents of instances of E53 Place. This property allows an instance of E53 Place’s maximum spatial extent (i.e. its outer boundary) to be assigned an instance of E94 Space Primitive value..

*P171 at some place within* is a shortcut of the fully developed path *E53 Place, P89 falls within, E53 Place, P168 place is defined by, E94 Space Primitive* through a declarative Place that is not explicitly documented to a Space Primitive: declarative places are defined in CRMgeo (Doerr and Hiebel 2013) –

Examples:

the spatial extent of the Acropolis of Athens (E53) is *at some place within* POLYGON ((37.969172 23.720787, 37.973122 23.721495 37.972741 23.728994, 37.969299 23.729735, 37.969172 23.720787)) (E94)

In First Order Logic:

 P171(x,y) ⊃ E53(x)

 P171(x,y) ⊃ E94(y)

The issue closed