

This file contains formatted extracts from the CotBaseSchema.xsd schema definition file. It is intended to be a more human readable form of the schema for reviewing prior to public release.

Each of the sections below describes either an attribute or element in the Cursor On Target base schema. The text for these sections was pulled directly from the XSD.

version - attribute, required:

Version of the Cursor On Target Schema, currently V2.0.

Uid - attribute, required

The "uid" attribute is a globally unique name for this specific piece of information. Several "events" may be associated with one UID, but in that case, the latest (ordered by timestamp), overwrites all previous events for that UID.

lat - attribute on point element, required

Latitude based on WGS-84 ellipsoid in signed degree-decimal format (e.g. -33.350000). Range -90 -> +90.

lon - attribute on point element, required

Longitude based on WGS-84 ellipsoid in signed degree-decimal format (e.g. 44.383333). Range -180 -> +180.

hae - attribute on point element, required

HAE acronym for Height above Ellipsoid based on WGS-84 ellipsoid (measured in meters).

ce - attribute on point element, required

Circular Error around point defined by lat and lon fields in meters. Although named ce, this field is intended to define a circular area around the event point, not necessarily an error (e.g. Describing a reservation area is not an "error"). If it is appropriate for the "ce" field to represent an error value (e.g. event describes laser designated target), the value will represent the one sigma point for a zero mean normal (Guassian) distribution.

le - attribute on point element, required

Linear Error in meters associated with the HAE field. Although named le, this Field is intended to define a height range about the event point, not necessarily an error. This field, along with the ce field allow for the definition of a cylindrical volume about the point. If it is appropriate for the "le" field to represent an error (e.g. event describes laser designated target), the value will represent the one sigma point for a zero mean normal (Guassian) distribution.

time, start, stale - attributes, required

The CoT XML schema includes three time values: time, start, and stale. "time" is a time stamp placed on the event when generated. start and stale define an interval in time for which the event is valid. Example: For the scenario where we have intel reports about a

meeting of terrorist operatives later in the day: An event might be generated at noon (time) to describe a ground based target which is valid from 1300 (start) until 1330 (stale). All time fields are required. In version 1.1 of the CoT schema, the time and stale attributes together defined an interval of time for which the event was valid. In V2.0, time indicates the "birth" of an event and the start and stale pair define the validity interval.

The "time" attribute is a time stamp indicating when an event was generated. The format of time, start, and stale are in standard date format (ISO 8601): CCYY-MM-DDThh:mm:ss.ssZ; e.g., 2002-10-05T17:01:14.00Z.

The "start" attribute defines the starting time of the event's validity interval. The start and stale fields together define an interval in time. It has the same format as time and stale.

The "stale" attribute defines the ending time of the event's validity interval. The start and stale fields together define an interval in time. It has the same format as time and start.

how - attribute on point element, required

The "how" attribute gives a hint about how the coordinates were generated. It is used specifically to relay a hint about the types of errors that may be expected in the data and to weight the data in systems that fuse multiple inputs. For example, coordinates transcribed by humans may have digit transposition, missing or repeated digits, estimated error bounds, etc. As such, they may require special attention as they propagate through the kill chain (e.g., they may require an additional review). Similarly, machine generated coordinates derived solely from magnetic sources may be subject to known anomalies in certain geographical areas, etc.

- h - human entered or modified (someone typed the coordinates)
- e - estimated (a swag by the user)
- c - calculated (user probably calculated value by hand)
- t - transcribed (from voice, paper, ...)
- p - cut and paste from another window
- m - machine generated
- i - mensurated (from imagery)
- g - derived from GPS receiver
- m - magnetic - derived from magnetic sources
- s - simulated - out of a simulation
- f - fused - corroborated from multiple sources
- c - configured - out of a configuration file
- p - predicted - prediction of future (e.g., a from a tracker)
- r - relayed - imported from another system (gateway)

As with other compound fields, the elements of the how field will be delimited by the field separator character "-". E.g., A coordinate mensurated from imagery would have a how field of "m-i".

type - attribute, required:

The "type" attribute is a composite of components delimited by the semi-colon character. The first component of this composite attribute is defined below. Future versions of this schema will define other components which we expect will aid in machine filtering. Despite the exclusion of definitions for additional components in this version of the schema, users of this schema should expect and design an optional trailing field delimited by the semi-colon character. This field can be ignored.

component1;optional field

The first component (component1) is a hierarchically organized hint about type. The intention is that this hierarchy be flexible and extensible and facilitate simple filtering, translation and display. To facilitate filtering, the hierarchy needs to present key fields in an easily parsed and logical order. To facilitate this, this component is a composite of fields separated by the "-" punctuation character, so a valid type would be: x-x-X-X-x. Using a punctuation for field separation allows arbitrary expansion of the type space, e.g., a-fzp-mlk-gm-...

Field meanings are type specific. That is, the third field of an "atom" type may represent air vs. ground while the same field for a "reservation" type may represent purpose.

The "Atoms" portion of the type tree requires some additional explanation past the taxonomy defined below. The "Atoms" portion of the type tree contains CoT defined fields and part of the MIL-STD-2525 type definition. To distinguish MIL-STD-2525 type strings from CoT defined fields, the MIL-STD-2525 types must be represented in all upper case. Differentiation of type namespace with upper/lower case facilitates extension of CoT types and MIL-STD-2525 types without name space confliction. An example:

a-f-A-B-C-x

The organization of CoT and MIL-STD-2525 types can be determined from the taxonomy below, but additional details are provided here.

The "Atoms" portion of the "type" tree contains the "Battle Dimension" and "Function ID" fields taken from MIL-STD-2525. "Battle Dimension" is a single character taken from MIL-STD-2525. The typical 2525 representation for "Function ID" is three groups of two characters separated by a space (e.g. "12 34 56"). The CoT schema maps this to a "-" delimited list of characters. (e.g. "1-2-3-4-5-6"). The concatenation of the "Battle Dimension" and "Function ID" fields from the MIL-STD-2525 specification represented in the CoT schema will be as follows:

battle dimension-func id char1-func id char2- ... -func id char6

When an appropriate MIL-STD-2525 type exists, it should be used. If there is a MIL-STD-2525 representation which is close, but may be refined, a CoT extension to the 2525

type can be appended. For example a-h-X-X-X-X-X-i might represent hostile MIL-STD-2525 type X-X-X-X-X of Israeli manufacture. Again, the CoT extension uses lower case. Conceptually, this extension defines further branching from the nearest MIL-STD-2525 tree point.

If no appropriate 2525 representation exists, a type definition can be added to the CoT tree defined here. The resulting definition would be represented in all lower case. For example a-h-G-p-i might define atoms-hostile-Ground-photon cannon-infrared.

The taxonomy currently looks like this: Note that the coding of the sub fields are determined entirely by the preceding fields!

+--- First position, this event describes

|
V

a - Atoms - this event describes an actual "thing"

+--- CoT affiliation of these atoms

|
V

p - Pending

u - Unknown

a - Assumed friend

f - Friend

n - Neutral

s - Suspect

h - Hostile

j - Joker

k - Faker

o - None specified

x - Other

+--- Battle dimension

| Taken from MIL-STD-2525 "Battle Dimension" (upper case)

|
V

See MIL-STD-2525B specification for single character battle dimension

+--- Function (dimension specific!)

|
|
V

...

See MIL-STD-2525B specification for function fields (must be upper case)

...

+--- The event describes ...

|

V

b - Bits - Events in the "Bit" group carry meta information about raw data sources. For example, range-doppler radar returns or SAR imagery represent classes of information that are "bits". However, tracks derived from such sources represent objects on the battlespace and this have event type "A-..."

The intention with the "Bit" type is to facilitate the identification of germane information products. This hierarchy is not intended to replace more detailed domain-specific meta information (such as that contained in NITF image headers or the GMTI data formats), rather it is intended to provide a domain-neutral mechanism for rapid filtering of information products.

+--- Dimension

|

V

i - Imagery

e - Electro-optical

i - Infra red

s - SAR

v - video

...

r - Radar

m - MTI data

...

d - Sensor detection events

s - Seismic

d - Doppler

a - Acoustic

m - Motion (e.g., IR)

m - Mapping

p - Designated point (rally point, etc.)

i - initial points

r - rally points

...

r - Reservation/Restriction/References

Events in this category are generally "notices" about specific areas. These events are used for deconfliction and conveyance of significant "area" conditions. Generally, the "point" entity will describe a conical region that completely encloses the affected area. The details entity will provide more specific bounds on precisely the region affected.

u - Unsafe (hostile capability)

o - Occupied (e.g., SOF forces on ground)

c - Contaminated (NBC event)

c - chemical

x - agents, direction,

y

z

f - Flight restrictions

t - Tasking (requests/orders)

Events in this category are generalized requests for service. These may be used to request for data collection, request mensuration of a specific object, order an asset to take action against a specific point. Generally, the "details" entity will identify the general or specific entity being tasked.

s - Surveillance

r - Relocate

e - Engage

m - Mensurate

c - Capability (applied to an area)

s - Surveillance

r - Rescue

f - Fires

d - Direct fires

i - Indirect fires

l - Logistics (supply)

f - Fuel

...

c - Communications

access - attribute, optional

The access field is intended to indicate who has access to this event. (e.g. unrestricted, nato, army, coalition...) It is currently defined as a string, and is optional in V2.0. Future version of the event schema will provide formal definition of this field.

qos - attribute, optional

The QoS attribute will determine the preferential treatment events receive as they proceed through the kill chain. The field has several distinct but related components.

A "priority" value indicates queuing and processing order for competing events. At a processing bottleneck (e.g., bandwidth limited link) high priority events will be processed before lower priority events. Priority determines queuing order at a bottleneck.

9 - highest (most significant) priority

0 - lowest (least significant) priority

A "overtaking" value indicates how two events for the same uid are reconciled when they "catch up" to one another. The more recent event (by timestamp) may supersede the older event (deleting the old event) when it catches it, or it may follow the old event so that event order is preserved, or it may be routed independently of previous events.

r - replace - new event replaces (deletes) old event

f - follow - new event must follow previous events

i - independent - new event processed independently of old events

An "assurance" value indicates how much effort must be placed in delivering this particular event. Events from sources that continually send updates (blue force tracks) or that are sent for information purposes only require a lower level of delivery effort. Events that are singletons (sent only once) and are critical require guaranteed delivery.

g - guaranteed delivery (message never dropped even if delivered late)

d - deadline (message dropped only after "stale" time)

c - congestion - message dropped when link congestion encountered

Thus, a valid QoS field looks like:

qos="1-r-c"

Note that different events with the same UID may have differing QoS values. This enables a graceful degradation in the presence of congestion. For example, a blue force tracker may output a sequence of events with like

... qos="1-r-c" ... frequent, low priority updates

... qos="1-r-c" ...

... qos="1-r-c" ...

... qos="5-r-d" ... occasional "push" priority update

... qos="1-r-c" ...
... qos="1-r-c" ...
... qos="9-r-g" ... "Mayday" position report

opex - attribute, optional

The opex field is intended to indicate that the event is part of a live operation or an exercise. For backward compatibility, absence of the opex indicates "no statement", which will be interpreted in an installation specific manner.

Example:

opex="o-NorthernWatch" or "e-JFEX04"

o = operations

e = exercise

item - attribute, optional

Some CoT events require two "type" fields, one specifying the action to be taken (e.g., a "tasking"), and a second specifying the type of object to be acted upon. For example, a tasking of "destroy" may need to be augmented with the target type.

The 'item' attribute serves as an auxiliary type field. It is intended to provide amplification when the 'type' field requires an object. It has the same format and syntax as CoT's type field.

detail - element, optional

format = XML schema defined outside of this document

The "detail" entity is intended to carry information that is specific to smaller communities of producers and consumers and require more intimate knowledge of the operating domain. For example, mensurated "target" events may come from dramatically different sources and need to propagate dramatically different "detail" information. A close-air-support mission will augment target details with initial point and callsign details to facilitate coordination of weapon delivery. In contrast, a mission planning system may augment planned targets with target catalog information and weapon fuzing requirements.

Because the "details" portion of the event are of interest only to a subset of subscribers, that entity may be mentioned by reference when the event is communicated. This reduces the congestion when events are transmitted over bandwidth limited links and also prevents the retransmission of static data elements.