XML Definition

For Environment Model Building Tool (EMBT)

Version 1.0

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1. **Introduction**

   This document will describe the XML definitions for the file formats of each of the tools for the EMBT.

2. **XML Definition for Object Builder**

   ```xml
   <!DOCTYPE object [
   <!ELEMENT object (name, x, y, z, shape*)>
   <!ELEMENT shape (*primative)>
   <!ELEMENT primative (sphere|box|cone|cylinder)>
   <!ELEMENT sphere (name, x, y, z, direction, radius, color, hot, stationary, weight)>
   <!ELEMENT box (name, x, y, z, direction, color, length, width, height, hot, stationary, weight)>
   <!ELEMENT cone (name, x, y, z, direction, radius, height, color, hot, stationary, weight)>
   <!ELEMENT cylinder (name, x, y, z, direction, radius, height, color, hot, stationary, weight)>
   <!ELEMENT x (#PCDATA)>
   <!ELEMENT y (#PCDATA)>
   <!ELEMENT z (#PCDATA)>
   <!ELEMENT radius (#PCDATA)>
   <!ELEMENT length (#PCDATA)>
   <!ELEMENT width (#PCDATA)>
   <!ELEMENT height (#PCDATA)>
   <!ELEMENT name (#PCDATA)>
   <!ELEMENT direction (#PCDATA)>
   <!ELEMENT hot (#PCDATA)>
   <!ELEMENT stationary (#PCDATA)>
   <!ELEMENT weight (#PCDATA)>
   ]>
   ```

2.1. **PCDATA Descriptions**

   - **x** – an integer that represents the x-axis coordinate (note for the object the x coordinate is absolute while the primitive x coordinate is relative to the object)

   - **y** – an integer that represents the y-axis coordinate (note for the object the y coordinate is absolute while the primitive y coordinate is relative to the object)

   - **z** – an integer that represents the z-axis coordinate (note for the object the z coordinate is absolute while the primitive z coordinate is relative to the object)

   - **radius** – a double that represents the radius of the shape measured in meters

   - **color** – a string that represents the color of the shape, it will be in the form of “r g b” (e.g. “0.0 1.0. 0.0”).

   - **length** – a double that represents the length of the shape measured in meters

   - **width** – a double that represents the width of the shape measured in meters

   - **height** – a double that represents the height of the shape measured in meters

   - **name** – a string that represents the id of the shape or object
direction – a double that represents the number of radians that the shape is rotated around the y-axis

hot – a double that represents the temperature of the shape

stationary – a double that indicates if the object can move or not (0.0 not stationary 1.0 stationary)

weight – a double that indicates the weight of the shape

3. XML Definition for Terrain Builder

```xml
<?xml version="1.0"?>
<!DOCTYPE terrain [  
<!ELEMENT terrain (name,num-points,points-per-row,size,*point)>  
<!ELEMENT name (#PCDATA)>  
<!ELEMENT num-points (#PCDATA)>  
<!ELEMENT points-per-row (#PCDATA)>  
<!ELEMENT size (x-min,x-max,y-min,y-max)>  
<!ELEMENT x-min (#PCDATA)>  
<!ELEMENT x-max (#PCDATA)>  
<!ELEMENT y-min (#PCDATA)>  
<!ELEMENT y-max (#PCDATA)>  
<!ELEMENT point (index,x,y,z)>  
<!ELEMENT index (#PCDATA)>  
<!ELEMENT x (#PCDATA)>  
<!ELEMENT y (#PCDATA)>  
<!ELEMENT z (#PCDATA)> ]>
```

3.1. PCDATA Descriptions

name – a string that represents the id of the terrain

num-points – a integer that represents to total number of points that make up the point of triangles of the terrain

points-per-row – a integer that represents how many points per row of triangles

x-min – the minimum x-axis value for the terrain measured in meters

x-max – the maximum x-axis value for the terrain measured in meters

y-min – the minimum y-axis value for the terrain measured in meters

y-max – the maximum y-axis value for the terrain measured in meters

x – an integer that represents the x-axis coordinate of the point

y – an integer that represents the y-axis coordinate of the point

z – an integer that represents the z-axis coordinate of the point

index – an integer that represents the id of a point
4. XML Definition for Environment Builder

<?xml version="1.0"?>
<!DOCTYPE env-model [ 
  <!ELEMENT env-model (terrain*,object*)>
  <!ELEMENT terrain (name,num-points,points-per-row,size,*point)>  
  <!ELEMENT name (#PCDATA)>  
  <!ELEMENT num-points (#PCDATA)>  
  <!ELEMENT points-per-row (#PCDATA)>  
  <!ELEMENT size (x-min,x-max,y-min,y-max)>  
  <!ELEMENT x-min (#PCDATA)>  
  <!ELEMENT x-max (#PCDATA)>  
  <!ELEMENT y-min (#PCDATA)>  
  <!ELEMENT y-max (#PCDATA)>  
  <!ELEMENT point (index,x,y,z)>  
  <!ELEMENT index (#PCDATA)>  
  <!ELEMENT x (#PCDATA)>  
  <!ELEMENT y (#PCDATA)>  
  <!ELEMENT z (#PCDATA)>  
  <!ELEMENT object (name,shape*)>  
  <!ELEMENT shape (*primative)>  
  <!ELEMENT primative (sphere|box|cone|cylinder)>  
  <!ELEMENT sphere (name,x,y,z,direction,radius,color,hot,stationary,weight)>  
  <!ELEMENT box (name,x,y,z,direction,color,length,width,height,hot,stationary,weight)>  
  <!ELEMENT cone (name,x,y,z,direction,radius,height,color,hot,stationary,weight)>  
  <!ELEMENT cylinder (name,x,y,z,direction,radius,height,color,hot,stationary,weight)>  
  <!ELEMENT x (#PCDATA)>  
  <!ELEMENT y (#PCDATA)>  
  <!ELEMENT z (#PCDATA)>  
  <!ELEMENT radius (#PCDATA)>  
  <!ELEMENT color (#PCDATA)>  
  <!ELEMENT length (#PCDATA)>  
  <!ELEMENT width (#PCDATA)>  
  <!ELEMENT height (#PCDATA)>  
  <!ELEMENT name (#PCDATA)>  
  <!ELEMENT direction (#PCDATA)>  
  <!ELEMENT hot (#PCDATA)>  
  <!ELEMENT stationary (#PCDATA)>  
  <!ELEMENT weight (#PCDATA)> ]>

4.1. PCDATA Descriptions

See sections 2.1 and 3.1 above.