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Subject: Export linear location information for switch tip/left/right branch and crossings

Posted by [heidrun.jost@thalesgroup](mailto:heidrun.jost@thalesgroup) on Fri, 22 Mar 2024 15:16:19 GMT

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Dear all,

we have a question for modelling location information at points and crossings.

For insertion of a TemporarySpeedRestriction starting at a point or crossing we need to export the point/crossing extensions:

[BILD]

In our model the tip-branch, left-branch and right-branch are not engineered as track elements and therefore they cannot be exported as rail3:track elements.

Our current solution looks like this:

```
<switchIS id="Dhk3FD1ZZsZZfKdMmH8xO7V9">
  <name name="6" language="en"/>
  <spotLocation id="SL_Dhk3FD1ZZsZZfKdMmH8xO7V9"
netElementRef="Z3GkdhHfEBn3Xvh6bZZpx2V9" intrinsicCoord="0">
  <linearCoordinate positioningSystemRef="lpsID_23" measure="31410"/>
  </spotLocation>
  <leftBranch netRelationRef="Z3GkdhHfEBn3Xvh6bZZpx2V9_VyATIZHrOBtcgXQ7DBI5Cfa"/>
  <rightBranch
netRelationRef="Z3GkdhHfEBn3Xvh6bZZpx2V9_Z3q46YPEowm4bZHzS4G2Ysl8"/>
</switchIS>
```

Our solution is to add linear location information for each point branch to the export. The implicit association between the linear location and the tip-, left and right branch can be determined by the branch specific net relations.

```
<switchIS id="Z7YkbysVoqh1S5aZD44nOAz8">
  <!-- tip branch /-->
  <linearLocation id="LL_T_Z7YkbysVoqh1S5aZD44nOAz8">
    <associatedNetElement netElementRef="ypQhOfgM0r7fWvQ4mjsVL9"
intrinsicCoordBegin="1" intrinsicCoordEnd="0.9" keepsOrientation="true">
      <linearCoordinateBegin positioningSystemRef="lpsID_91" measure="168869"/>
      <linearCoordinateEnd positioningSystemRef="lpsID_91" measure="168874"/>
    </associatedNetElement>
  </linearLocation>

  <!-- left branch /-->
  <linearLocation id="LL_L_Z7YkbysVoqh1S5aZD44nOAz8">
    <associatedNetElement netElementRef="kDAg4skv4haCdKBBnFZZyWa"
intrinsicCoordBegin="0" intrinsicCoordEnd="0.1" keepsOrientation="true">
      <linearCoordinateBegin positioningSystemRef="lpsID_91" measure="168874"/>
      <linearCoordinateEnd positioningSystemRef="lpsID_91" measure="168939"/>
    </associatedNetElement>
  </linearLocation>
```

```

</associatedNetElement>
</linearLocation>

<!-- right branch /-->
<linearLocation id="LL_R_Z7YkbysVoqh1S5aZD44nOAz8">
  <associatedNetElement netElementRef="sQAouLaZHRDbYgyqEhEj4Xa"
intrinsicCoordBegin="1" intrinsicCoordEnd="0.9" keepsOrientation="true">
    <linearCoordinateBegin positioningSystemRef="lpsID_91" measure="168874"/>
    <linearCoordinateEnd positioningSystemRef="lpsID_91" measure="168914"/>
  </associatedNetElement>
</linearLocation>

  <spotLocation id="SL_Z7YkbysVoqh1S5aZD44nOAz8"
netElementRef="ypQhOfgM0r7fWvQ4mjsVL9" intrinsicCoord="1">
    <linearCoordinate positioningSystemRef="lpsID_91" measure="168874"/>
  </spotLocation>
  <leftBranch netRelationRef="kDAg4skv4haCdKBBnFZZyWa_ypQhOfgM0r7fWvQ4mjsVL9"/>
  <rightBranch netRelationRef="sQAouLaZHRDbYgyqEhEj4Xa_ypQhOfgM0r7fWvQ4mjsVL9"/>
</switchIS>

```

Note: The determination which linear location belongs to which branch can be done by evaluating the rail3:switchIS branch net relations.

```

<leftBranch netRelationRef="kDAg4skv4haCdKBBnFZZyWa_ypQhOfgM0r7fWvQ4mjsVL9"/>
<rightBranch netRelationRef="sQAouLaZHRDbYgyqEhEj4Xa_ypQhOfgM0r7fWvQ4mjsVL9"/>

```

The tip branch can be found by comparing both netRelations and taking the netElement which is referenced in both.

The other netElement is the branch specific (left/right) net relation.

```

  <netRelation id="kDAg4skv4haCdKBBnFZZyWa_ypQhOfgM0r7fWvQ4mjsVL9"
positionOnA="0" positionOnB="1" navigability="Both">
  <!-- tip /-->
  <elementA ref="kDAg4skv4haCdKBBnFZZyWa"/>
  <!-- left branch /-->
  <elementB ref="ypQhOfgM0r7fWvQ4mjsVL9"/>
</netRelation>
  <netRelation id="sQAouLaZHRDbYgyqEhEj4Xa_ypQhOfgM0r7fWvQ4mjsVL9"
positionOnA="1" positionOnB="1" navigability="Both">
  <!-- tip /-->
  <elementA ref="sQAouLaZHRDbYgyqEhEj4Xa"/>
  <!-- right branch /-->
  <elementB ref="ypQhOfgM0r7fWvQ4mjsVL9"/>
</netRelation>

```

After finding the branch specific netElement the linearLocation can be found by comparing against linear locations associatedNetElement/netElementRef value.

right-branch linear location -> right branch km values:

```

<linearLocation id="LL_R_Z7YkbysVoqh1S5aZD44nOAz8">

```

```
<associatedNetElement netElementRef="sQAouLaZHRDbYgyqEhEj4Xa"  
intrinsicCoordBegin="1" intrinsicCoordEnd="0.9" keepsOrientation="true">
```

First question: Is this solution correct or is there a better proposal?

Second question: We need the same for crossings. But this solution does not work for crossings.

A crossing consists of 4 netElements (upper-left, lower-left, upper-right and lower-right).

The netRelations for crossings (and switchable crossings) are provided via straight branch and turning branch netRelations.

It is not possible to find out based on these netRelations, which netElement belongs to upper-left, lower-left, upper-right and lower-right.

Best regards,

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