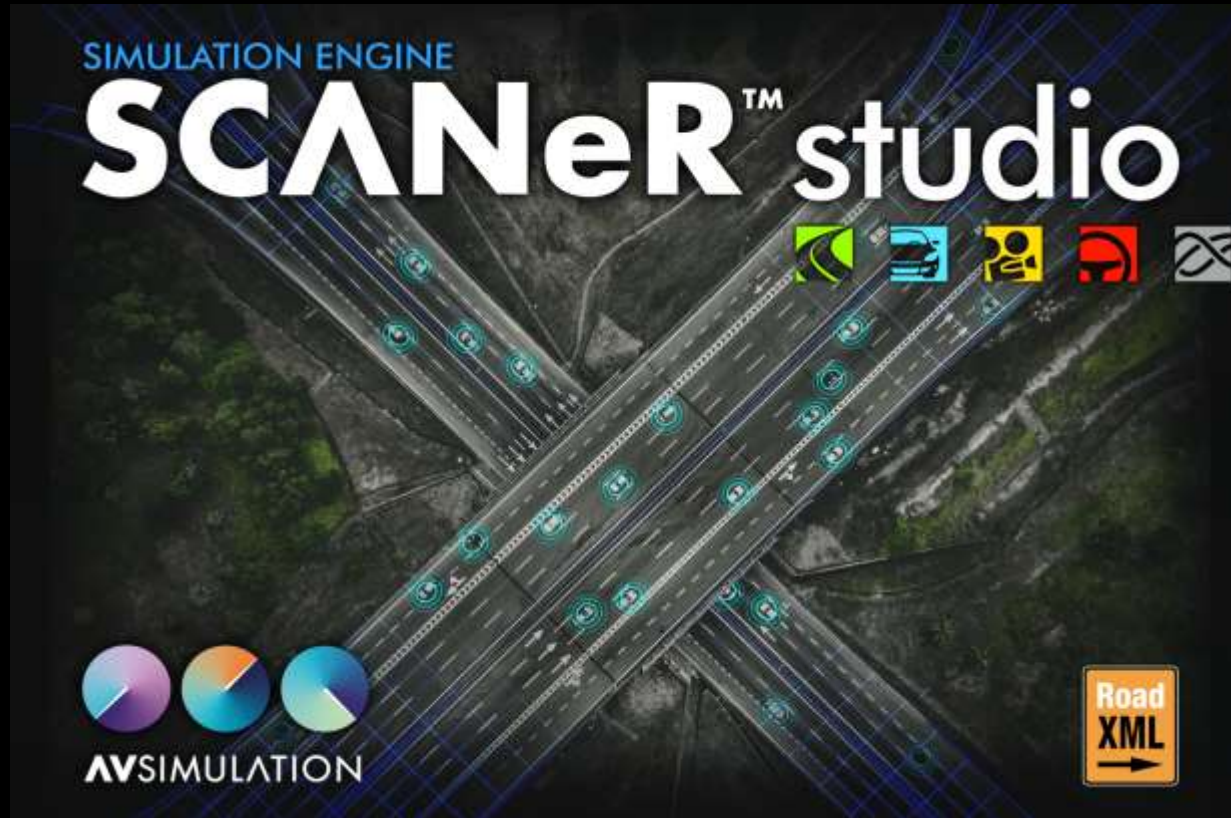




Innovate > Simulate > Accelerate



ScenarioGenerator Advanced



Innovate > Simulate > Accelerate

Session Program

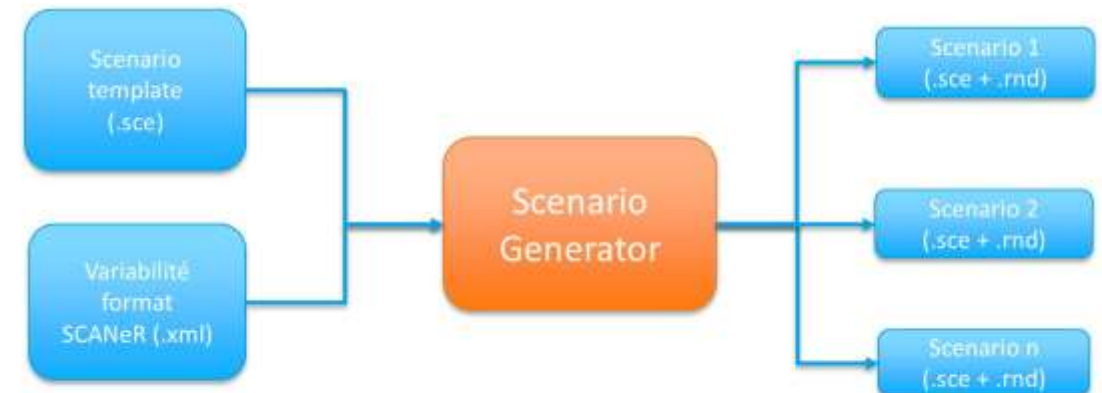
- Introduction
- Preconditions
- Launch the « ScenarioGenerator.exe »
- Integrated workflow

Session Program

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Introduction : features

- ScenarioGenerator creates a set of different scenarios and terrains (.SCE and .RND) based on a template scenario. It is a step to test the scenario variations in a massive simulation system.
- Modifications are :
 - Vehicle : initial speed, state (TRAFFIC module effects)
 - Weather : Rain and Snow density (3D effect in the VISUAL module)
 - Scenario-Tree item : xpath value (Scenario effect)
 - Scenario-Script variable : value (SCENARIO module effect)
 - Add a traffic vehicle on a track : (Scenario effect)
 - Track : Nb of lanes, Slope, Curvature, Portion position (Terrain effect)
- When the .RND is modified, new .IVE and .SOL files are generated
- The use of ScenarioGenerator is protected by a License



Introduction

- Other tools for multiple scenario generation
 - *Parametric exploration* : historical solution integrated in SCANeR
 - *SCANeR Explore* : new tool integrated into the future SCANeR HPC solution
- Advantages of ScenarioGenerator
 - Tighter control from customer (easy to control from customer's software : XML configuration, CMD launch)
 - Terrain effects (number of lanes, curvature, slope, ...) are exclusive to ScenarioGenerator

Session Program

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Preconditions : files

- Have a SCANeR configuration {MyConf}
- Have a {SCEtemplate}.SCE file in the .../SCANeRstudio_1.8\data\{MyConf}\scenario folder
 - the scenario must stop itself : a stop criteria or a goToTask(END-SCENARIO) action
 - take care that no pop-up message or other system is waiting for a human intervention
 - It's better if the scenario evaluates itself (a script can set an ExportChannel that indicates the level of success)
- Have the relevant {RNDtemplate}.RND in the .../SCANeRstudio_1.8\data\{MyConf}\terrain folder
- Put a {MySceGeneFile}.xml file in the .../SCANeRstudio_1.8\data\{MyConf}\scenario folder as described below
 - This file is meant to be produce by software

Preconditions : XML file description

- Starts with: `<?xml version="1.0" encoding="UTF-8" standalone="yes" ?><gen version="1.7" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"><GenSet>`
- Set the name of the scenario pattern: `<scenarioFile>{SCEpattern}.SCE</scenarioFile><ValueSet>`
- Set the name of the generated scenario by using (here « 1-1.SCE »): `<outputBaseFileName>1-1</outputBaseFileName>`
- Set the Snow level (same with Rain): `<Weather><Snow><level>0.1</level></Snow></Weather>`
- Set the value of a script variable (here « Cuttin distance »): `<ScriptVariables><ScriptVariable><name>Cuttin distance</name><val>1.7</val></ScriptVariable></ScriptVariables>`
- Set to 120km/h the initial speed of the vehicle {N}: `<Vehicle><id>{N}</id><InitialSpeed><val>120</val></InitialSpeed></Vehicle>`
- Set the state (0=Normal, 1=Inactive, 2=Invisible) of the vehicle {N} (here « Inactive »): `<Vehicle><id>{N}</id><State><val>1</val></State></Vehicle>`
- Set the slope of a track in the terrain pattern (here « Track12 ») (same with Curvature): `<Track><name>Track12</name><Slope><val>0.1</val></Slope></Track>`
- Set the number of lanes of a track in the terrain pattern (here « Track12 ») (need an integer value): `<Track><name>Track12</name><Nlanes><val>2</val></Nlanes></Track>`
- Set the portion position of a track in the terrain pattern (here portion {N} of « Track12 »): `<Track><name>Track12</name><Portion><portionID>{N}</portionID><Abscissa><val>200</val></Abscissa></Portion></Track>`
- Set Traffic generation on a track in the terrain pattern (here « Track12 »): `<Track><name>Track12</name><GenerateTraffic><endAbscissa>280</endAbscissa><gap>0.5</gap><laneID>5</laneID><speed>100</speed><startAbscissa>50</startAbscissa><stayOnLane>1</stayOnLane></GenerateTraffic></Track>`
- End with: `</ValueSet></GenSet></gen>`

Preconditions : XML file sample

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<gen version="1.7" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
```

```
  <GenSet>
    <scenarioFile>template.sce</scenarioFile>
    <ValueSet>
      <outputBaseFileName>generated-1</outputBaseFileName>
      <Weather>
        <Snow>
          <level>0.1</level>
        </Snow>
      </Weather>
      <ScriptVariables>
        <ScriptVariable>
          <name>Cuttin distance</name>
          <val>1.7</val>
        </ScriptVariable>
        <ScriptVariable>
          <name>Cuttin time</name>
          <val>2.8</val>
        </ScriptVariable>
        <ScriptVariable>
          <name>Snow</name>
          <val>0.1</val>
        </ScriptVariable>
      </ScriptVariables>
    </ValueSet>
  </GenSet>
```

```
    <Vehicle>
      <id>0</id>
      <maxSpeed>36.11111111111111</maxSpeed>
      <modelType></modelType>
      <safetyTime>2</safetyTime>
      <InitialSpeed>
        <val>120</val>
      </InitialSpeed>
    </Vehicle>
    <Vehicle>
      <id>1</id>
      <maxSpeed>36.11111111111111</maxSpeed>
      <modelType></modelType>
      <safetyTime>2</safetyTime>
      <InitialSpeed>
        <val>130</val>
      </InitialSpeed>
    </Vehicle>
    <Track>
      <name>Segment de Route</name>
      <Slope>
        <val>0.1</val>
      </Slope>
      <Curvature>
        <val>-0.0005</val>
      </Curvature>
    </Track>
  </ValueSet>
</ValueSet>
</GenSet>
```

```
</gen>
```

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- Use console commands :
 - To go in the binaries folder =>
`cd %STUDIO_PATH%\SCANeRstudio_1.8\bin\x64\`
 - Launch the creation of the versions =>
`ScenarioGenerator.exe <MyConf> generate <MySceGeneFile>.xml`

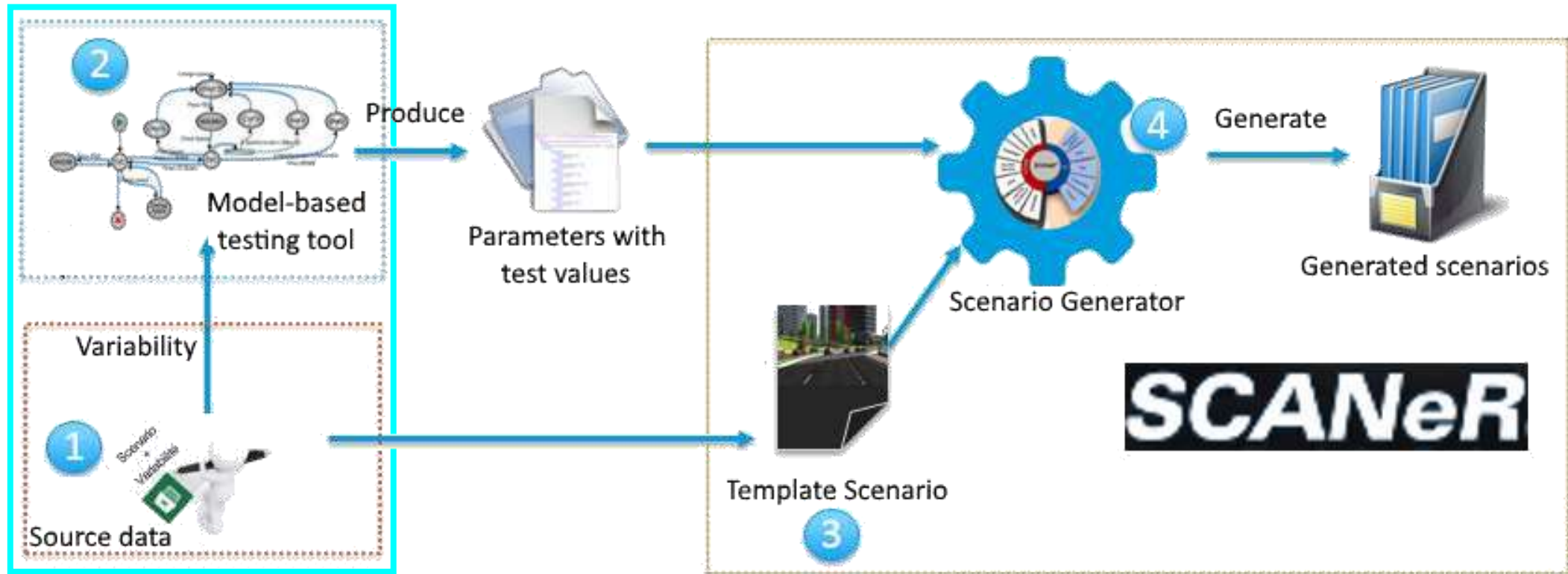
👉 Do not put the full directory path of your configuration.xml file, because it could causes execution errors

👉 This will generate as many SCE as <outputBaseFileName> and as many RND (+IVE +SOL) if <Track> is defined in the XML file

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Integrated workflow



- | | |
|--|---|
| 1. Scenario specification | |
| 2. Produce variability of the scenario | any XML compatible testing tool (e.g. MaTeLo™) |
| 3. Create the template scenario | use SCANeR™ Studio |
| 4. Automatically generate scenarios | use Scenario Generator |

**Software and processes of the user*

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