

Setting up and running the APEX framework

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A prototype is simulated in APEX by first installing and configuring the Opensimulator server (see build instructions at the Opensimulator website¹). Configuration involves copying the *communication/execution* component's DLL to the Opensimulator *bin* folder. CPN Tools must also be downloaded and installed in the server machine.

Installation is a one time process. To execute a prototype, the CPN model must be loaded in CPN Tools, its simulation started, and the Opensimulator server executed. Users can connect to the virtual environment once the Opensimulator server has been executed, the *communications/execution* DLL has been loaded, and connection to CPN Tools enabled. The users are connected using accounts that have previously been created in the Opensimulator server (*create user* command).

To connect to the prototype, the user must:

1. install a viewer to connect to the virtual environment via the web;
2. run the viewer pointing it to the IP address at which the Opensimulator server is listening for connection;
3. connect to the server machine using a provided user account.

Free exploration and interaction with the virtual environment is possible after these steps have been taken. APEX provides features that enable command execution within the viewer tool. These features include initialising the synchronisation between the simulation and the modelling layers. The commands provided by APEX are:

- *load oar filename* - load an environment or object from an OAR file;
- *save oar filename* - save an environment or object from an OAR file;

¹ Opensimulator build instructions: http://opensimulator.org/wiki/Build_Instructions (last accessed: 17 June 2013)

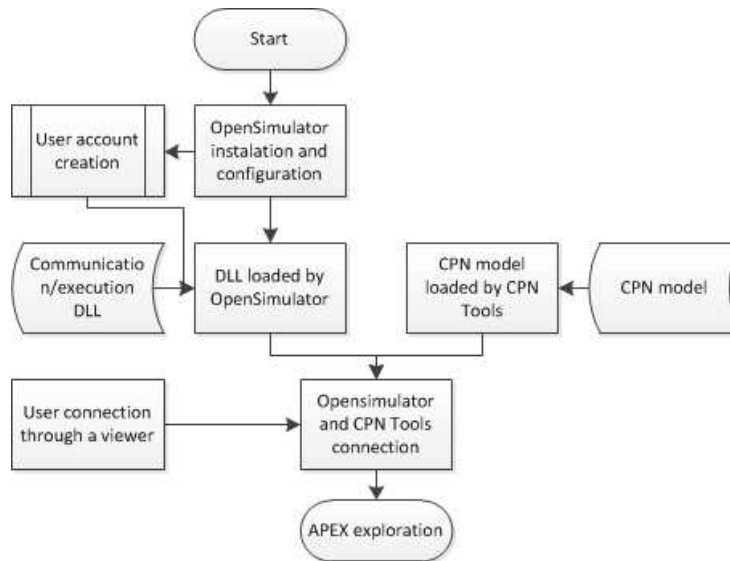


Figure 1: Installation steps diagram

- *clear* - remove all objects from the scene;
- *obj ini* - send the dynamic objects values (*ID*, *type* and *position*) to the CPN model;
- *sensors ini* - initialise the sensors at the modelling layer with the values of the sensors present in the environment;
- *sensors update* - update the sensors with current values.

The steps to be performed are illustrated in Figure 1.