An Integrating Server Environment (ISE)

The ISE performs two general tasks, allocated as two computer and communication functionalities.

Task 1. To ensure data concentration and acquisition between Smart Lab devices interfaces and the High Performance Computing core. The ISE manages the real time data streams, generated by all Smart Lab devices and interfaces. ISE will implement driver functionality for collecting the data streams from the tomography, 3D scanner and to keep their integrity during the communications with the HPC. The sets of data are tracked, providing right order of transmissions, nevertheless that all data are generated in arbitrary order. The output streams of data from HPC and the Smart Lab devices are manage properly, by means to have in a common virtual environment for all users the common resources as the Visual wall and the 3D printer. Thus unpleasant events as deadlock of services will be overcome. The task 1 defines that the ISE subsystem is playing management role for the allocation of the resources of Smart Lab. Per user requests.

Task 2. The ISE tackles control and management functionalities, related with control of transportation systems, modeling, simulation and optimization of traffic systems and parameters. The Intelligent Transportation Systems (ITS) integrate many complex components, software and hardware for traffic management and ramp metering. The ISE provides and environment for design, test and simulation various control policies on wide range of transportation systems: free way traffic, motorway control, macroscopic and microscoping modeling. The ISE is able to provide on line control of traffic lights, applying network connections with traffic light controller. The ISE supports simulation tasks on AIMSUN software suit, optimal control by TRANSYT package, real time communications with traffic lights controllers. A real time data for the transport system feeds the software tools of the ISE and can be on-line changed and optimized. The optimized solutions concerns:

- The durations of the traffic lights cycles;
- The signal splits for the green, amber and red lights. Particularly "green wave" on arterial subset of the network is generated;
- The ramp metering control for highways;
- Control of speed limitations.

Thus ISE is able to integrate and to manage large amounts of real-time data. The picture 1 presents the core computational facility of ISE, fig2. illustrates the controller interface towards the traffic lights units.

Fig. 1

Fig. 2