

The third type of analysis considered is that of *Modes Composition Analysis*. This analyses the composition of system behaviour specified in all the modes given in the Modes architecture specification. The goal is to ensure that *quiescence* (consistency of system state before and after changes) is upheld. For example, in the switch example from Convoy to Detour (given in Fig. 3) an event received by the composition activity for a HighwayEmergency eventually leads to a notification of architectural change to a Detour Mode. Using analysis through model-checking the service engineer can check whether the behaviour specified in this is compatible through the Detour Mode service composition behaviour receiving this notification. At runtime it would be expected that a coordinator agent manages the events and runtime architecture changes (e.g. swapping in and out different service composition processes).

7 Modes Tool Suite

The Modes Tool Suite provides a set of features to describe, extract, transform and analyse service architecture configurations based upon the specification and models described in earlier sections of this chapter. A prototype implementation of the Modes Tool Suite includes a Modes Model Parser for UML2, Modes Broker Extract for Service Broker Runtime artifacts and extensions to the LTSA Eclipse WS-Engineer tool (and plug-ins). In this section we detail each of these parts. The integrated tool suite is illustrated in Fig. 7, and is available from <http://www.ws-engineer.net>.

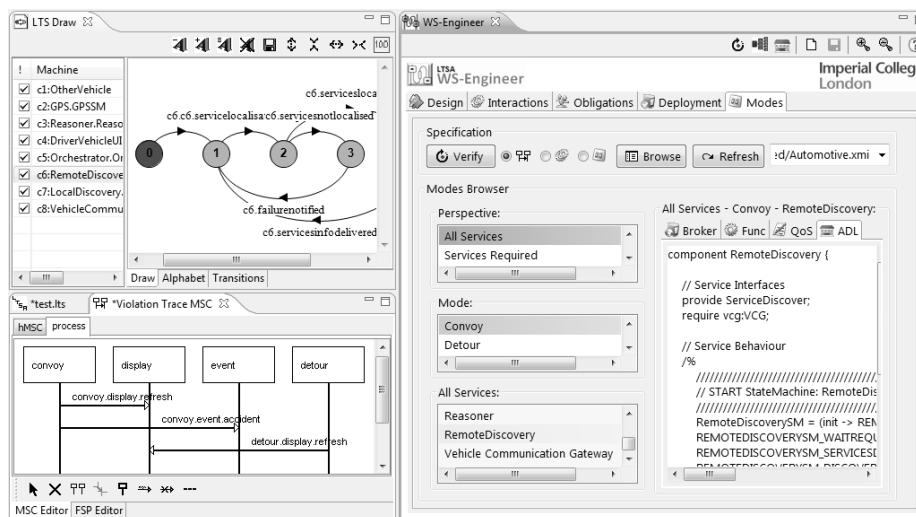


Fig. 7. LTSA WS-Engineer and service mode analysis