

# **“GRITS – GRreek Interoperable Tolling Systems ”**

**Real Time Interoperability in Greece via SOA (Service Oriented Architecture)**

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# Current situation regarding EFC

## Roads with EFC implemented

- Attiki Odos
- Moreas Highway
- Olympia Odos (Implementation on-going)
- Aegean Motorway (Implementation on-going)
- .....

## Tag Issuers

- Attiki Odos (A1-compliant, but with a reduced number of Authentication keys)
- Olympia Odos (A1-compliant)
- Aegean Motorway (A1-compliant)



# Interoperability definition

Only one Tag in each vehicle and this Tag can be used in the EFC systems on all participating roads.

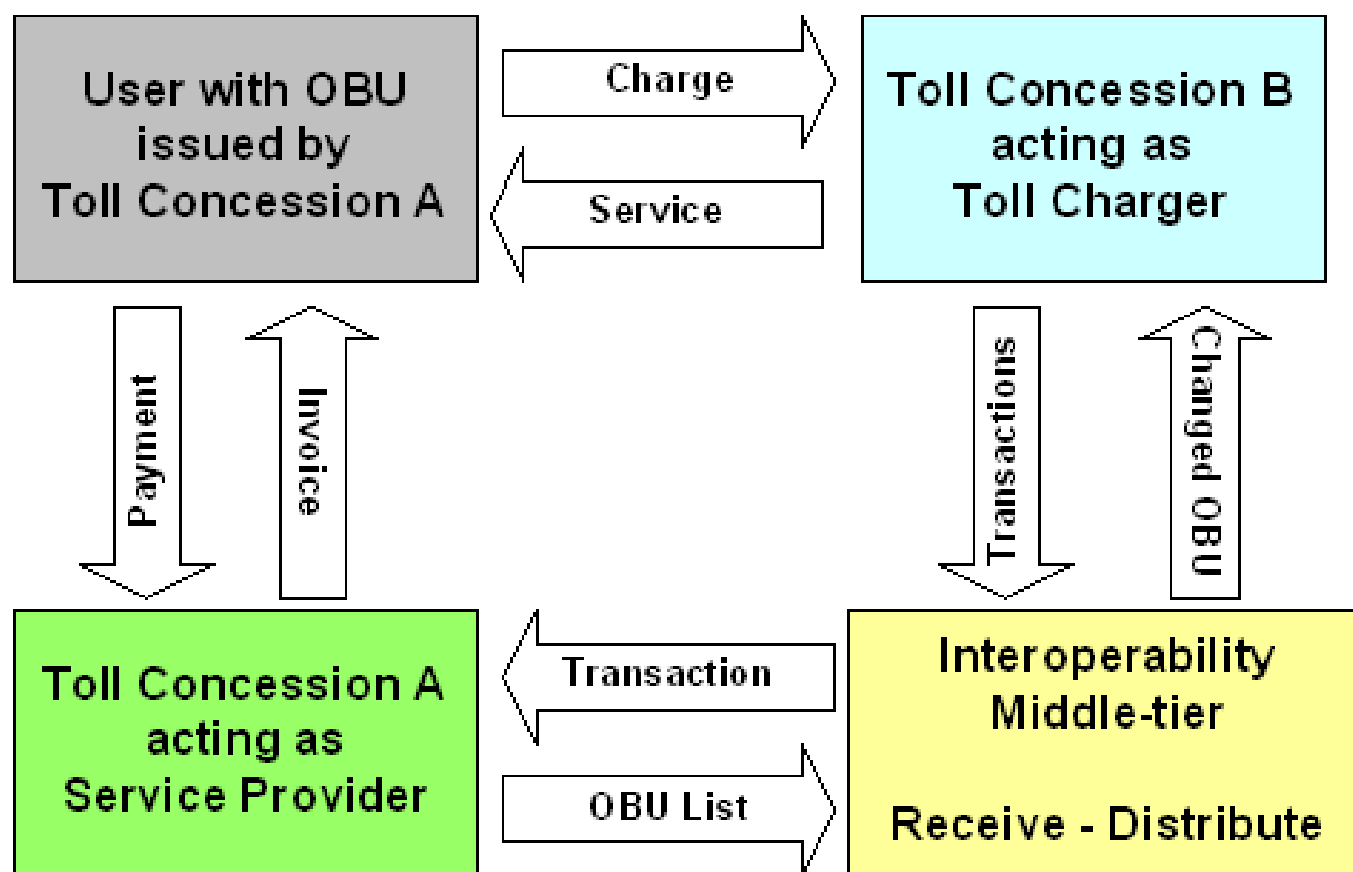


# Basis for interoperability

- One Contract (Tag) can be used at all road Operators
- Contract based on a central account at the Issuer of the Contract (Tag)
- Transaction model based on the Cardme-3,4 specification (A1-application)
- Lists of tags statuses (white, grey, black) are distributed by Issuer
- Usage of issued Tags are restricted to participating Operators
- Possibility of secure check of Contract origin at time of Tag transaction (OBU Authentication)
- Possibility of secure check of Claim before settlement between Service Provider and Toll Charger (Contract Authentication)

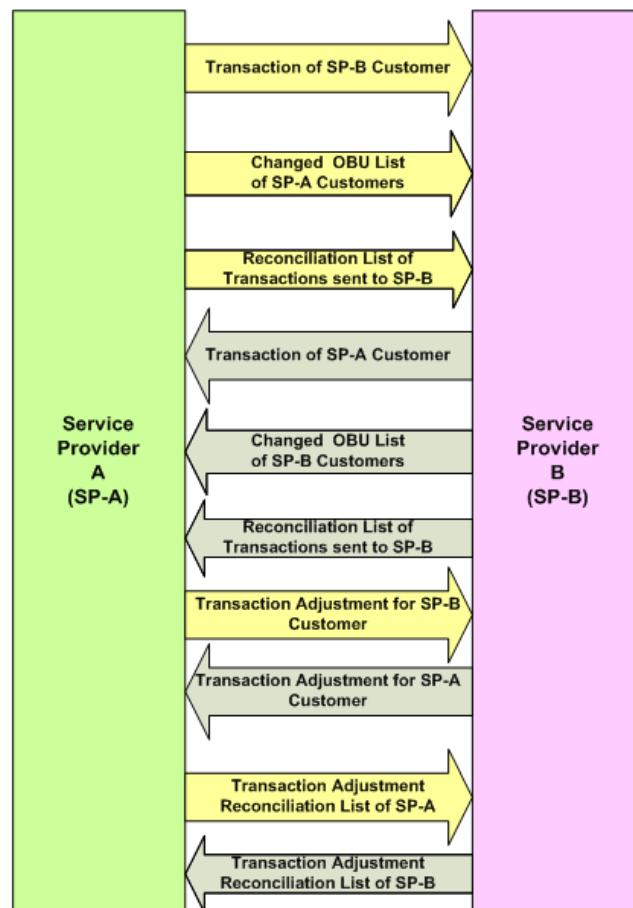


# Interoperable Concession Info exchange



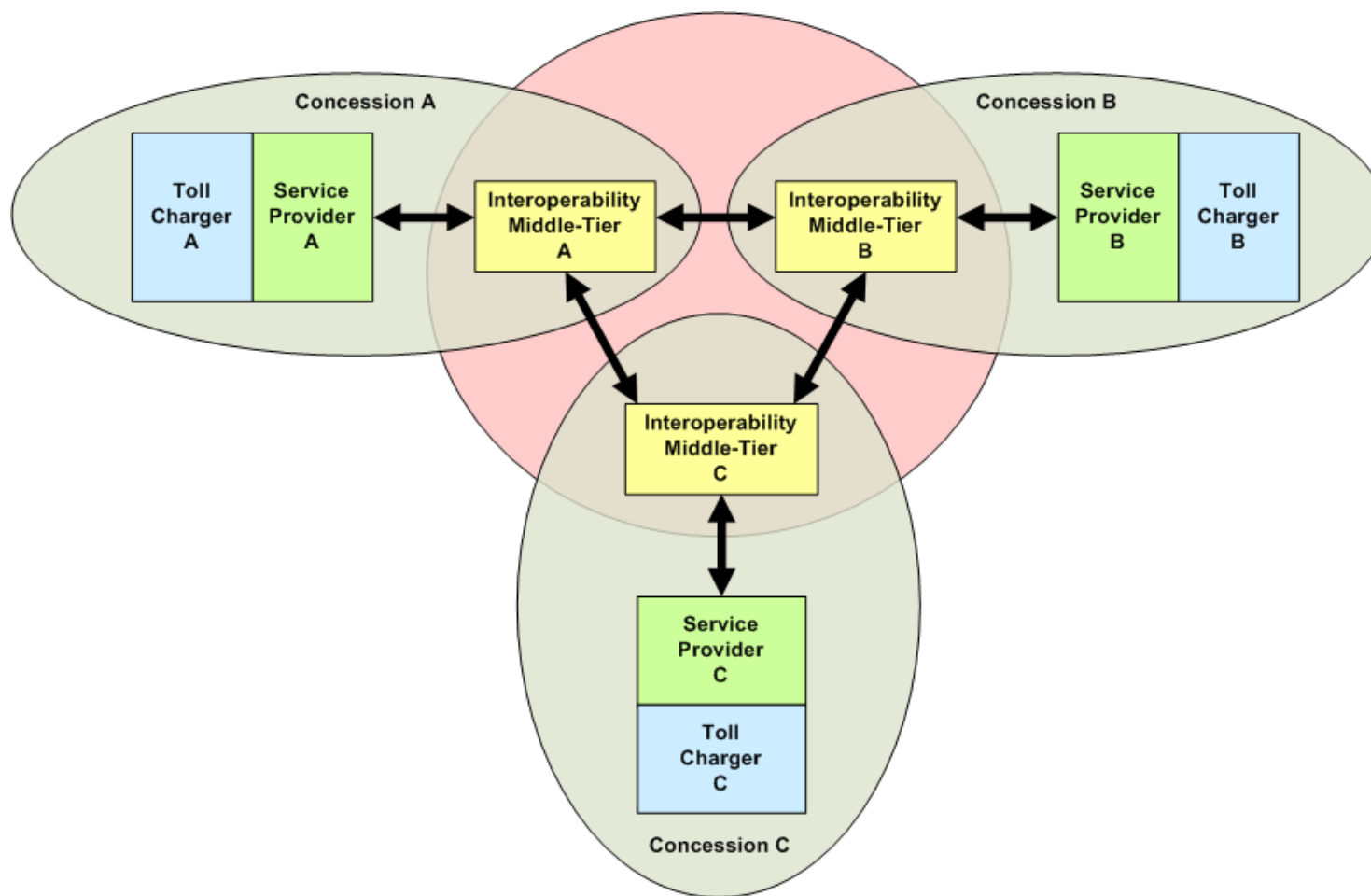


## Interoperable Concessions detailed data lists exchange



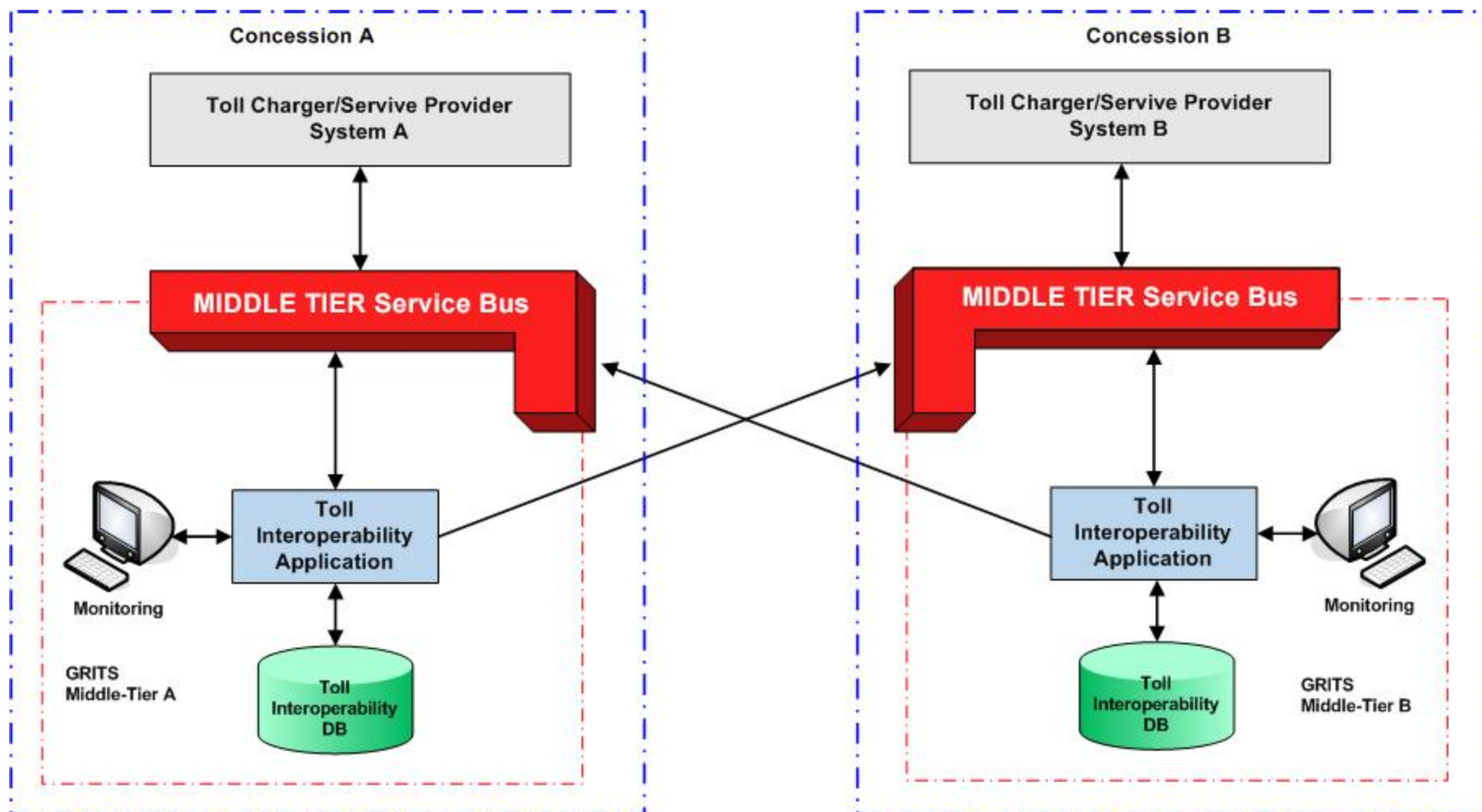


# GRITS Architecture Overview





# Technical Representation of GRITS Architecture

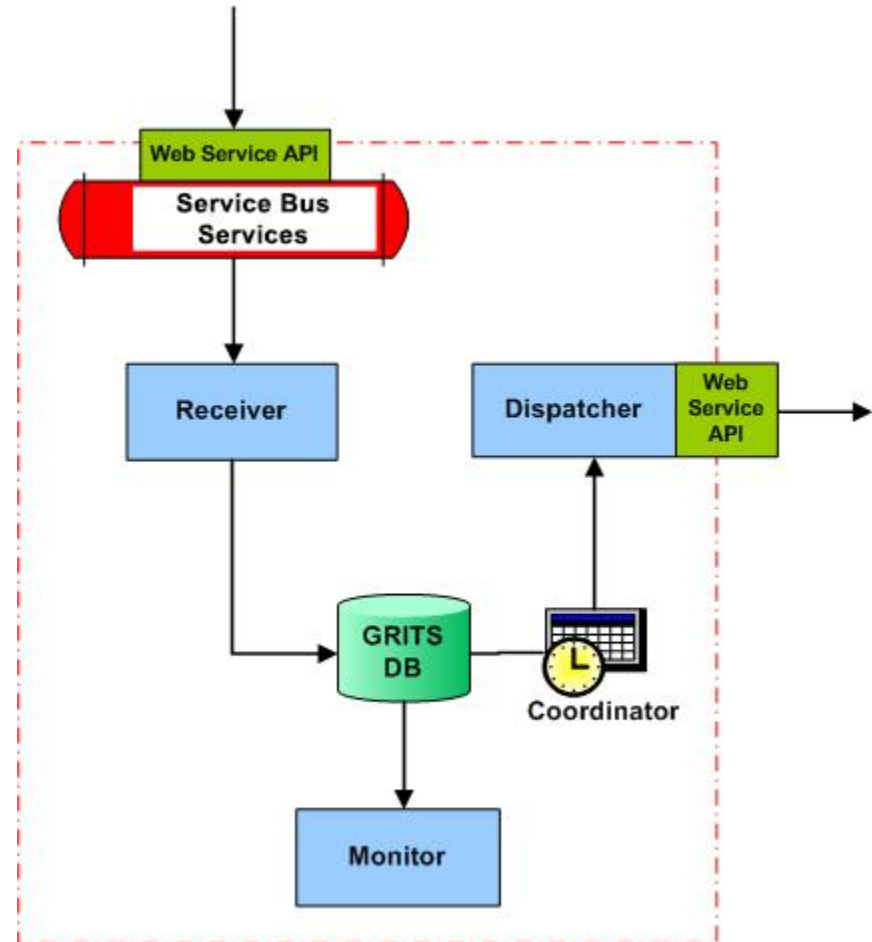






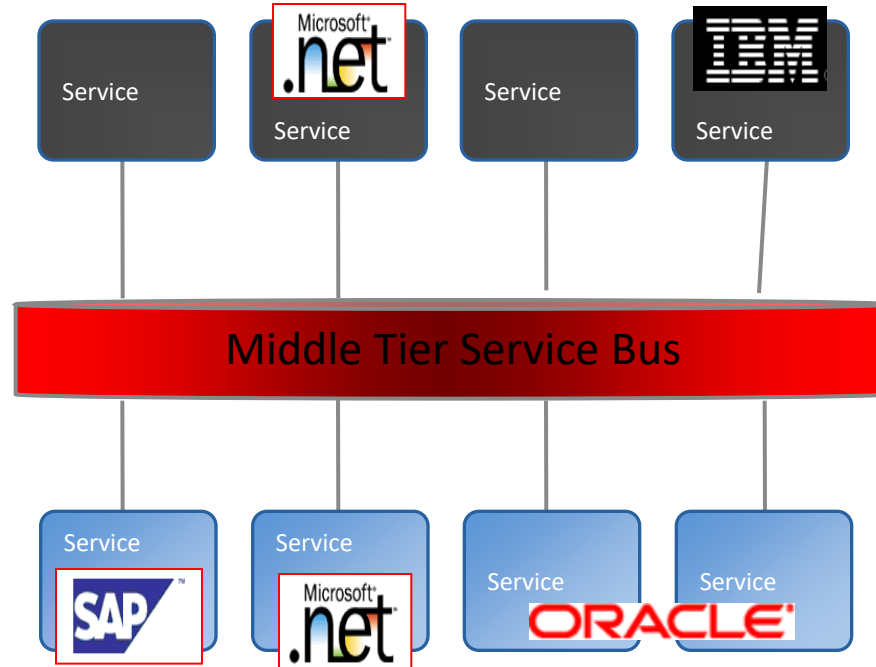
# GRITS Middle-Tier Architecture

- ESB Services
- Modules:
  - Receiver
  - Dispatcher
  - Coordinator
  - Monitor





# Dealing with heterogeneous back office systems via Web Services





# Benefits

- Standards based solution
  - Web Services
  - SOA Enterprise Service Bus (ESB Service Bus)
- Easy Integration of 3<sup>rd</sup> Party Toll Systems (WEB SVCS,ESB)
- Easy Installation & Configuration
- Real Time Monitoring



# Road to GRITS - Major Obstacles

- a) To obtain a commonly accepted agreement for a common organizational, commercial, operational, technical, legal and certification framework.
- b) The status of each European Community Member, legal framework, concerning personal data treatment , and enforcement methods permitted to insure proper and prompt collection of toll charges.
- c) The prevailing in GREECE Prepaid model which imposes great demands for performance of interoperability systems
- d) Different suppliers of Toll systems and related back offices, create the need for standardized and centrally controlled solutions that are able to deal with heterogeneous systems.