

# OSGi Automotive Workshop



January 11th, 2007

Delphi headquarters' Troy Michigan

# Agenda

Moderator: Peter Kriens, Technical Director & Evangelist,  
OSGi-Alliance

- 08.30 Arrival and coffee
- 09.00 Welcome
- 09.15 Introduction OSGi and Vehicle Expert Group
- 09.45 Participants Presentations
  - Workshop participants can give a brief presentation (5 min) on desired areas of work
- 10.30 Open Discussion
  - brainstorming on topics that VEG should work on
  - Look for common interest of areas
- 12.00 Prioritizing ideas
- 12.30 Lunch
- 13.30 Continued open discussion based on priority
- 15.30 OSGi organization, technical process, IPR overview, next steps
- 16.30 Adjourn



# OSGi Alliance

- Fosters an eco-system of hardware manufacturers, infrastructure providers, software developers, and service providers with the goal to create a common market for networked software services
  - Manages a solid specification process to create a standardized service platform that is usable across industries and hardware
  - Manages a certification process to guarantee interoperability
- Driven by real requirements from different markets



# Convergence Is Key



Automotive



Communication



Mobile To Mobile



Working People



# OSGi Technology

- OSGi technology is *Universal Middleware*.
  - OSGi technology provides a service-oriented, component-based environment for developers and offers standardized ways to manage the software lifecycle.
- OSGi technology is
  - Cross industry (mobile, vehicle, communications, administrative, software development)
  - Cross platform (embedded, PC, server, mainframe)



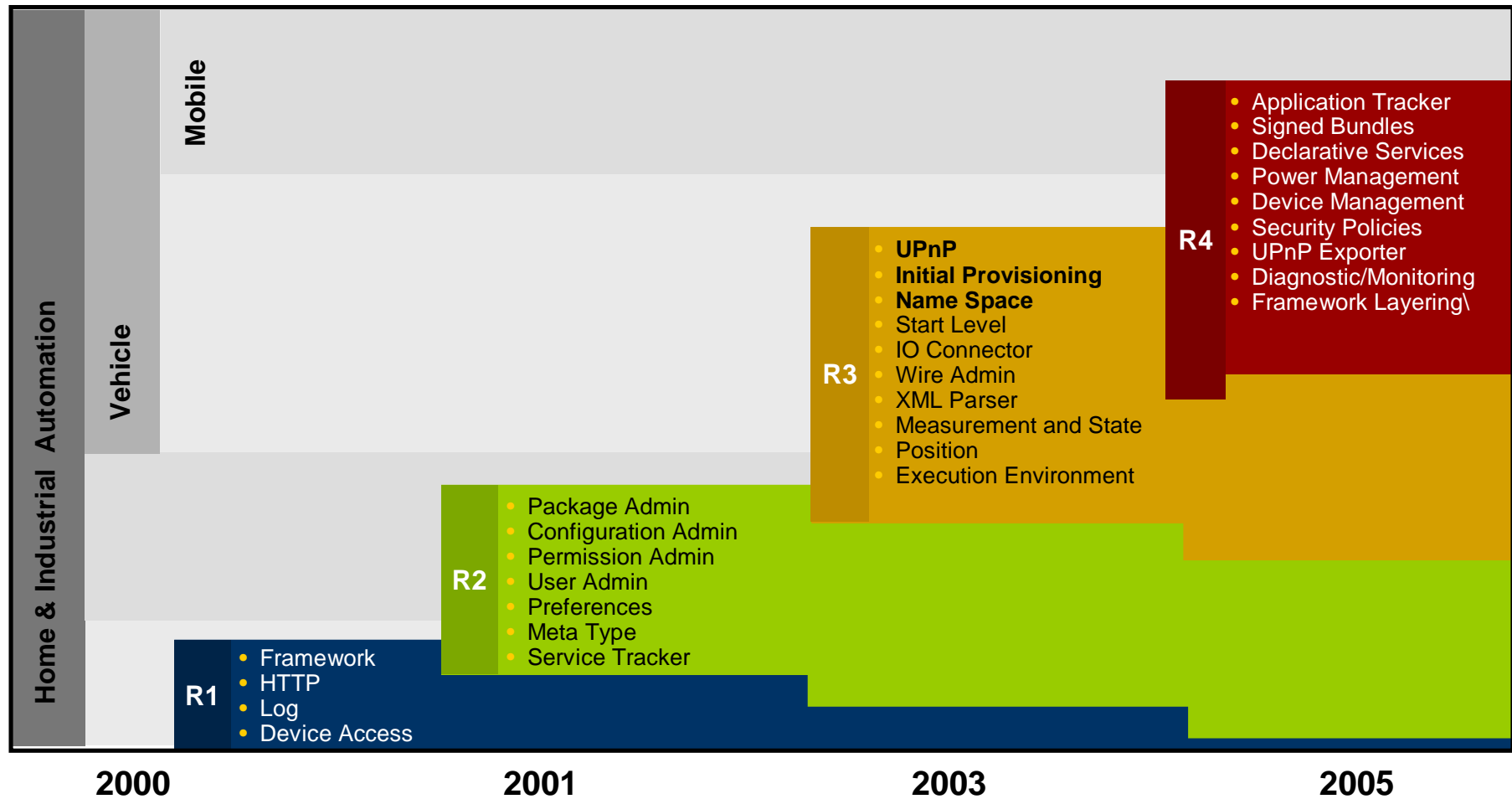
# OSGi Alliance

- Specifications are driven by members
  - Members write RFCs
  - Expert Groups review RFCs in teleconferences and meetings
  - RFCs are turned into specifications by a professional specification editor
- The OSGi Alliance can not “surge” the troops. High quality specification writing is hard work for members!

# Vehicle Expert Group

- Founded in 2002
- Charter
  - ... According to the OSGi policy, the VEG needs input from automotive, transport and telematics companies, as well as from other OSGi groups and other standardization organizations.
- Key players Smartmove/ACUNIA, BMW, Siemens VDO, ProSyst, Gatespace Telematics
- Related Projects and Products
  - Ertico 3GT
  - AMI-C
  - Ertico GST
  - BMW 5 series

# OSGi Service Platform



# VEG Pipeline

- Vehicle API
  - Provides access to low level sensors, actuators, and state of the vehicle
  - Based on OMA DM, a standard mobile device management protocol
- Diagnostics
  - Provides the possibility to download statistics and run diagnostic tests
- Power Management
  - Provides applications with the possibility to adapt their performance to the power state of the vehicle.
- Navigation API
  - Provides applications with the possibility to interact with the navigation system. Pretty cool!

# Why OSGi Technology?

- Because there should be a better way to develop software ...



# Participant Presentations



# About the Workshop



# Workshop Goals

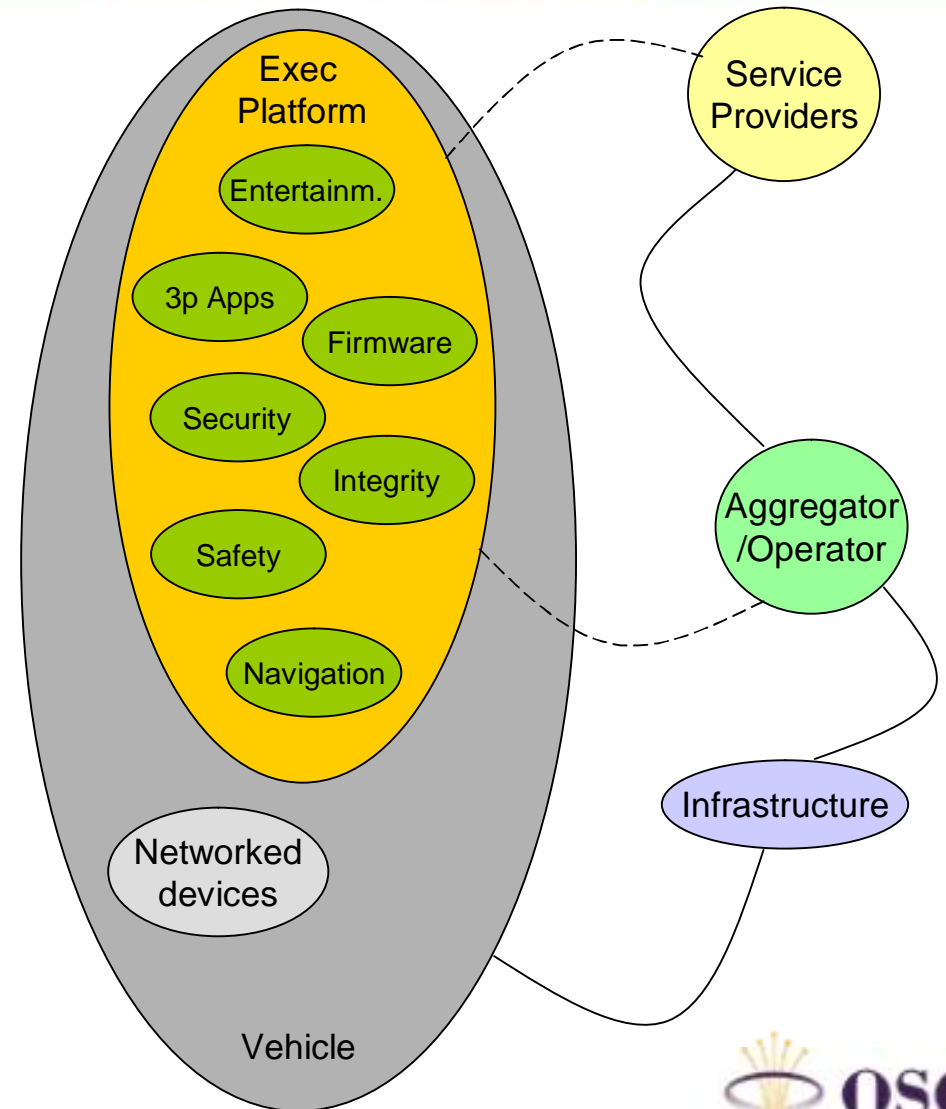
- Organize the multiple ad-hoc efforts in applying OSGi technology in vehicles
  - Ertico 3GT and GST projects
  - Ami-C
  - VII
  - ...
- Identify necessary liaisons
- Create a prioritized list of RFCs to make
- Sign up for work!

# Question 1: VEG Goal

- Create third party bundle market for applications running in vehicles?
  - Entertainment?
  - Enterprise?
  - Government mandated?
- Simplify software development for the OEMs by providing a common platform to their suppliers?
- Create a business model for service providers, aggregators, and OEMs based on networked services?
- Provide a technical foundation for projects like VII, GST, and road pricing?

# Question 2: What is the scope?

- What should the VEG scope be?
  - The OSGi provides an execution environment, what kind of applications should run on it?
    - Entertainment, Third party software (open/closed), Firmware (functions required by the car to operate), Security, Integrity, Safety, Navigation, ...
  - What should it integrate with?
    - Devices on the can/most/... busses?
    - To what level, should it handle the software on these devices?
  - Is the infrastructure included?
    - Should the same middleware run on the vehicle as well as in the net infrastructure?
  - Are business models included?
  - Are standards (protocols and APIs) needed for the Aggregator and Service Providers?



## Question 3: Where is the money?

- Specifications are hard work requiring a significant investment by the participants
  - What are the drivers for the participants to do this hard work?
  - Who will benefit from the work?
- What are the opportunities, what are the threats?

# Open Discussion



# List of Areas

- Safety
  - Use case: Stop when car in front of you brakes. Vehicle – Vehicle communication, event notification. Hint to the user, driver stays responsible? Brake activation? What is part of the impl.
  - Use case: Safe following distance
  - Generic Safety oriented service that provides information about the road conditions and other vehicles and the proximity
- Provisioning
  - Use case: OEMs can push bundles to the OBEs
  - Requires also deployment of non-OSGi parts
- Resource allocation policies/guarantees and hard real time issues for bundles
  - ARINC avionics standard in this area or relate to other standards
  - Prioritization, what they mean
  - Scheduling
- Non-Java code integration
  - Includes for example vml and framework, but also other apps.
- Vehicle Interface
  - Location, speed, temperature, heading, windspeed, traction, abs act. Airbag deployment, brake lights, technically any sensor
- HMI
  - Make it easier to integrate with existing HMIs
  - AMI-C already started this
  - VII will have HMI interaction requirements
- Security:
  - Use case: how to secure sessions and how to secure the application integrity
  - How to authenticate the vehicle (uses x509 certs) 1609.2 protocol
  - Confidentiality, integrity, authorization, authentication
  - Management of certificates, upload certificates

- Privacy
- Reprogramming ECUs
  - Issues with anonymity
  - How does this interact with existing standards around the vehicle databus
- Will OEMs open the OBE open up to 3p apps?
  - Will likely be the case
- Lobby with governments to require OSGi
  - Toll fee collection in Germany
  - In US states make a lot of decisions
  
- Drivers
  - Companies have to make too many drivers today
  - Standardized drivers
  - To connect anything there is out there
  - Resource and time critical requirements
- AutoSAR
  - Overlap?
  - Could autosar apis be available to VM appl.
  - Where do they connect

- Diagnostics
  - “offboard”
  - Access to detailed static data : VIN, model, type, options, engine, etc.
  - Access to real time data: engine speed, cooling temp, etc.
  - Abstraction needed because there is so much variation on the bottom
  - Choose network based on speed, acces, etc.
  - Bus types abstractions
  - Multiple levels of security
  - Needs safeguards
  - Run special code on demand, download over the air
- Download data like radio tuning, firmware of ecus, codecs, calibration files, scripts, etc.
- OSGi light
  - Something that can on a smaller device
  - What memory budget
  - What services:
  - Flexibility to create smaller impls. Of OSGi based systems
- Slaved to a core OSGi, with reduced functionality
- Distributed OSGi
- Navigation Model
- Liaison with CVTA
  - Depends on VEG status
- Make OSGi better known to people that decide what goes into the vehicle
  - Provide articles, whitepapers, convergence
  - Get rid of the question: OSG what?

# Prioritizing



# Priorities

- 7 • Resource allocation policies/guarantees and hard real time issues for bundles
- 5 • Vehicle Interface
- 5 • HMI
- 4 • Non-Java code integration
- 4 • AutoSAR
- 3 • Safety Information
- 3 • Provisioning
- 3 • Drivers
- 3 • Diagnostics
- 3 • Download data like radio tuning, firmware of ecus, codecs, calibration files, scr
- 3 • Navigation Model
- 2 • Security
- 2 • Lobby with governments to require OSGi
- 2 • OSGi light
  - Privacy
  - Reprogramming ECUs
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# OSGi Process Info (The exciting part)

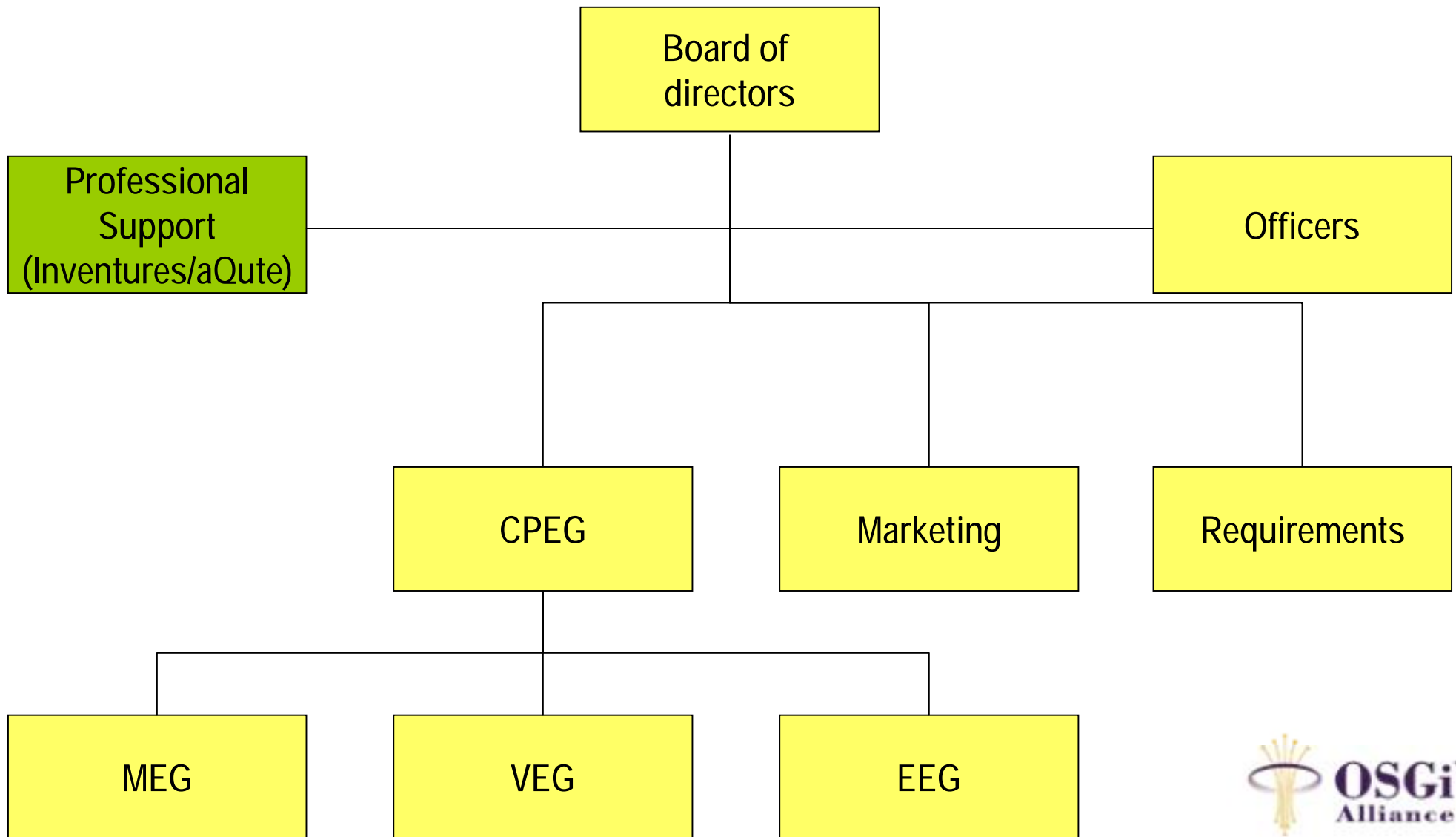


# OSGi Alliance Background

- Founded in 1999
- Initial focus home automation/embedded use. Today specifications are used in home, automotive, and mobile applications
- Currently Release 4
- Highly applicable in almost any computing situation
- Key features
  - Modularized
  - Dynamic
  - Secure
  - Manageable
- Current focus on becoming a standardized layer for universal middleware
  - Cross industry
  - Cross platform



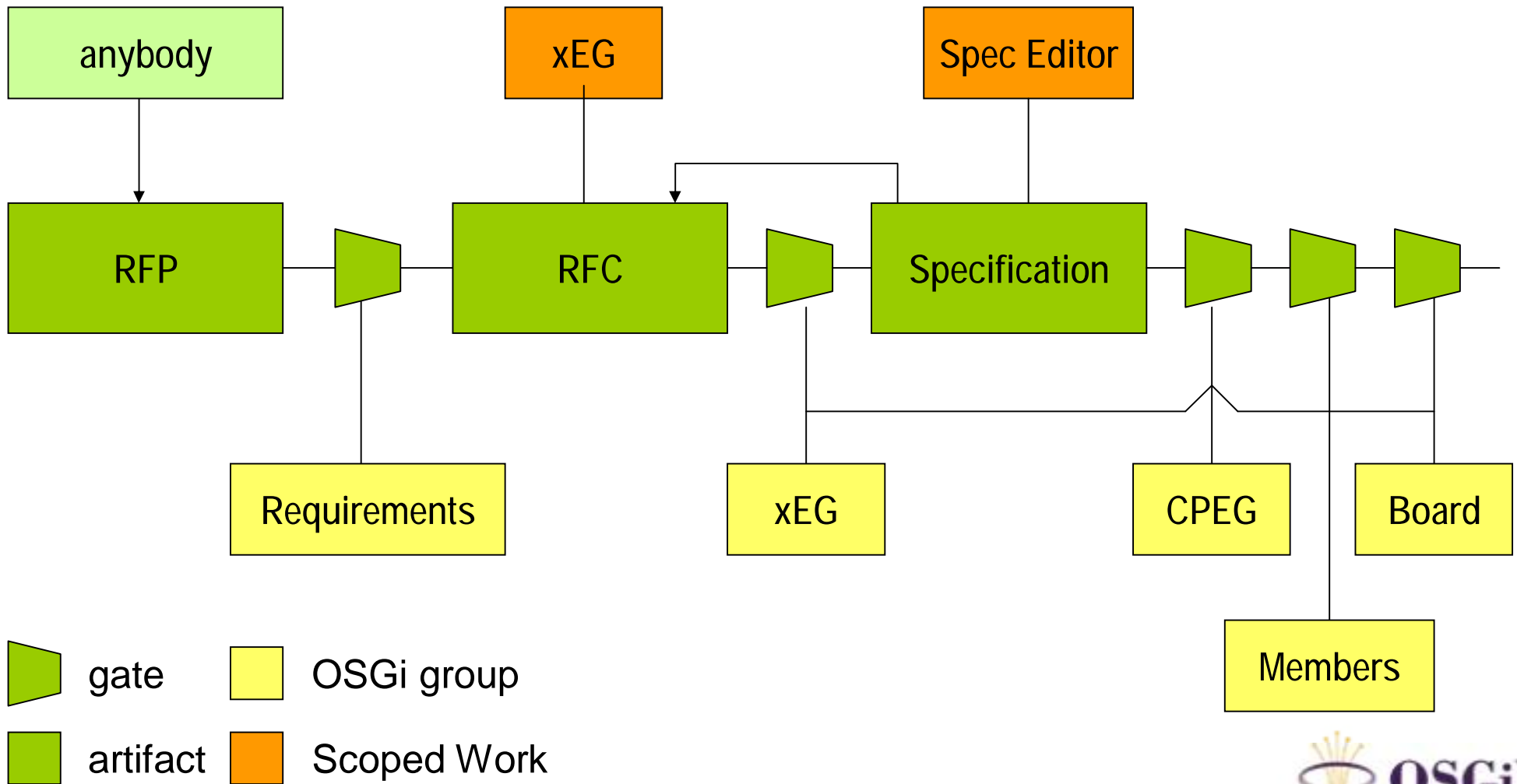
# Organization



# Technical Process

- Experts Groups
  - Charter (scopes the activities of the EG)
  - Statement of Work (SOW) scopes the activities of the members in the EG
- RFP
  - Requirements document can come from external sources
- RFC
  - Internal design documents, developed within an EG
- Specifications
  - Specification documents for external consumption
- Reference Implementations of *all* specifications
  - Can come from open source groups
- Test Compatibility Suites
  - Developed by EG members

# Process



# Next Steps

- Join OSGi as member to participate in the Vehicle Expert Group
- Agree for a kick-off meeting
- Write RFCs
- ...