

# AUTOSAR AT AB VOLVO

Presented by:  
Jens Svensson, Volvo 3P



# Welcome to Volvo Group

Volvo Group is one of the world's leading suppliers of transport solutions for commercial use.

We also provide complete solutions for financing and service.



# Volvo Group



Volvo Trucks



Renault Trucks



Mack Trucks



UD Trucks



Buses



Construction Equipment



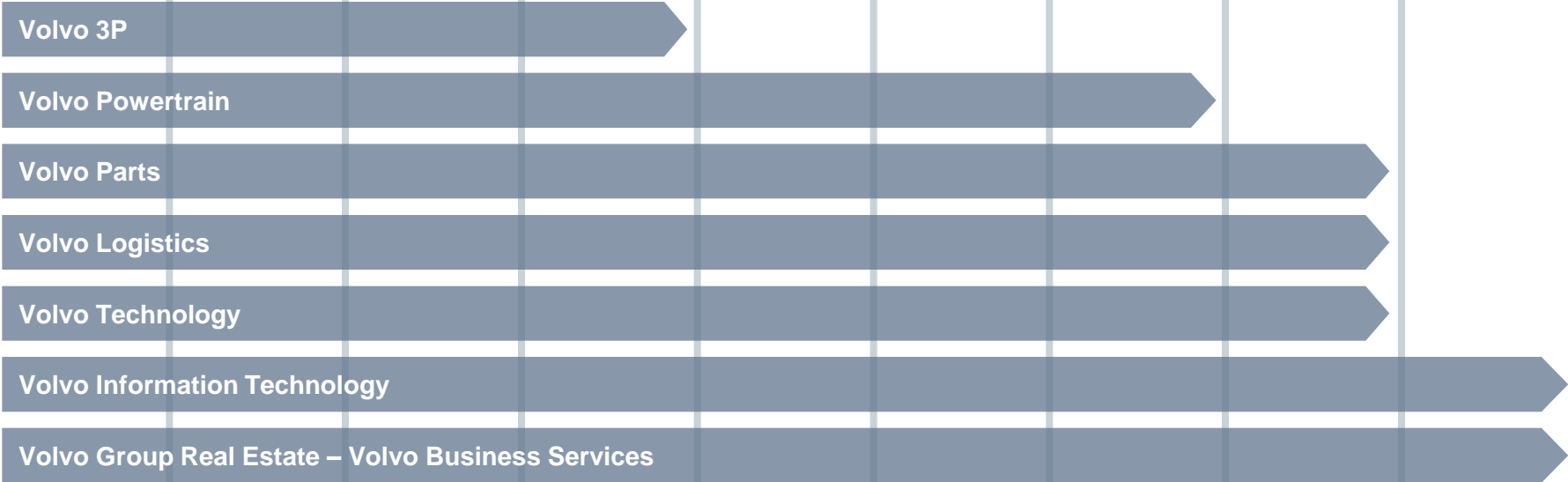
Volvo Penta



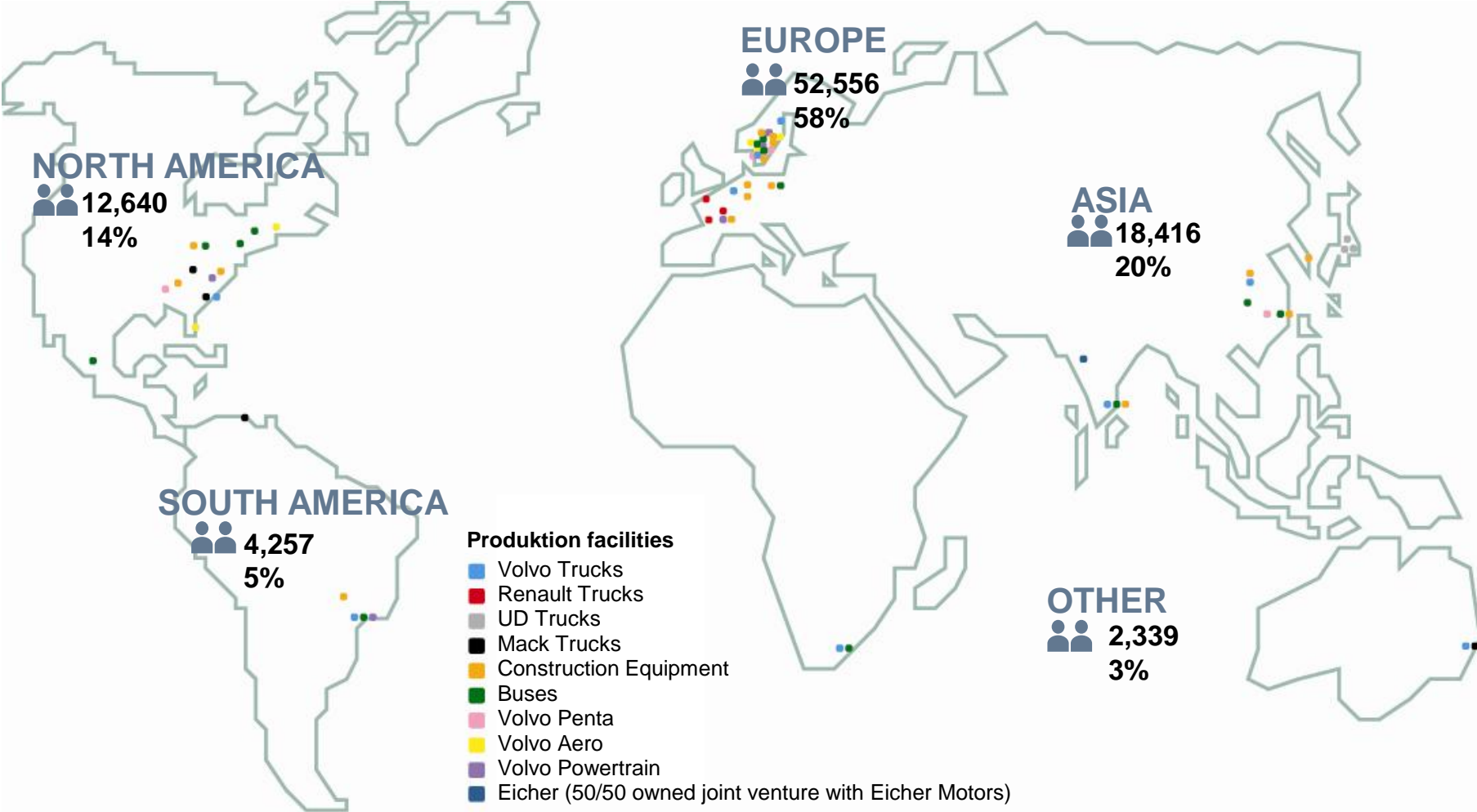
Volvo Aero



Financial Services



# Global Operations



# Volvo 3P Mission

**“To propose and develop profitable products to ensure a strong competitive offer for each truck company based on common vehicle architecture and shared technology”**

We do this based on modularized vehicles with standardized interfaces



# Where do we come from



## Today

- We do not mix supplier and Volvo SW in our ECUs
- Our maintenance costs and SW variants are increasing
- We have several unique infrastructure solutions
- Features are closely connected to specific components

# Where are we going



## Today

- We do not mix supplier and Volvo SW in our ECUs
- Our maintenance costs and SW variants are increasing
- We have several unique infrastructure solutions
- Features are closely connected to specific components

## Tomorrow

- Broader supplier base which gives us lower costs and distributed risks
- Increased SW flexibility in order to handle product changes
- Controlled maintenance costs
- Increased SW flexibility in order to facilitate branding features in line with Volvo strategies
- Carry over of applications and hardware components independently
- Possibility to buy SW to achieve unique selling points

# Volvo Group - EE Platform



Volvo Trucks



Renault Trucks



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Volvo Penta



Volvo Aero



Financial Services

Volvo 3P

Common Electric & Electronic Platform

# Commonality in different dimensions

Reuse of features that are unique for a specific segment (Heavy Duty, Medium Duty, Conventional).

Reuse of features that are unique for a specific brand (Volvo, Renault, Mack, Nissan Diesel).

Segment commonality

Brand commonality



# Decision to use AUTOSAR for future development

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Volvo Group Global > News & media > Press releases > Previous years > 2007

Press releases	26/11/2007
Previous years	Volvo Group first commercial vehicle manufacturer to introduce AUTOSAR
2008	
2007	
2006	by AB Volvo
2005	Through the new software standard Group will open up for new software innovative software developers could
2004	
2003	
2002	"AUTOSAR gives the automotive industry supplier with hardware from another installed in a desktop PC," says Anders Ydergård, Volvo Group.
2001	
2000	
1999	
1998	Traditionally, the Automotive OEMs have with built-in software and thereby less industry, there is now a standard specifying a hardware-independent software interface. The relation with the hardware supplier will remain but as it will be possible to add any software, a wide range of new suppliers can enter the market - from big suppliers in the telecom industry to small entrepreneurial companies.
1997	The Volvo Group joined the AUTOSAR, judged by the Volvo Group as suitable development for vehicles developed
1996	"The Volvo Group is an active player in the AUTOSAR platform," says Anders Ydergård. "We currently have a dialogue with our suppliers in this matter and since we are the first to implement the standard we are looking forward to a creative discussion with new and existing partners."
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November 26, 2007

For reporters who want more information, please contact Anders Ydergård, +46 31 66 11 99.

 Printer friendly version

26/11/2007

## Volvo Group first commercial vehicle manufacturer to introduce AUTOSAR

by AB Volvo

Through the new software standard AUTOSAR (AUTomotive Open System ARchitecture), the Volvo Group will open up for new software suppliers. In addition to the traditional suppliers, independent and innovative software developers could become part of Volvo Group's supplier base.

The Volvo Group joined the AUTOSAR partnership in 2004 and the current status of the standard is now judged by the Volvo Group as suitable for use in development projects. All embedded software development for vehicles developed by the Volvo Group will conform to the AUTOSAR standard.

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Volvo Group

**VOLVO**

# Two AUTOSAR packages at Volvo

- Based on Release 3.0 of AUTOSAR. The strategy is to follow the development with AUTOSAR when new versions are available.

## VAP

### Volvo AUTOSAR Platform

- Complete AUTOSAR Basic Software and RTE.
- Extended with features not included in AUTOSAR R3.0 (extensions based on solutions from AUTOSAR R4)
- All central and strategic ECUs are required to use this package
  - Secures future functional add-ons to VAP
  - Enables future reuse of functions and ECU

## CSWC

### Common Software Components

- CSWC includes parts of the AUTOSAR Basic Software for common features
  - Communication
  - Diagnostics
  - Network management
  - Software download
- Off-the-shelf and non-strategic ECUs are required to use this package

# Three goals for the VAP/CSWC supplier business model



Secure use of VAP/CSWC across all business areas in Volvo Group

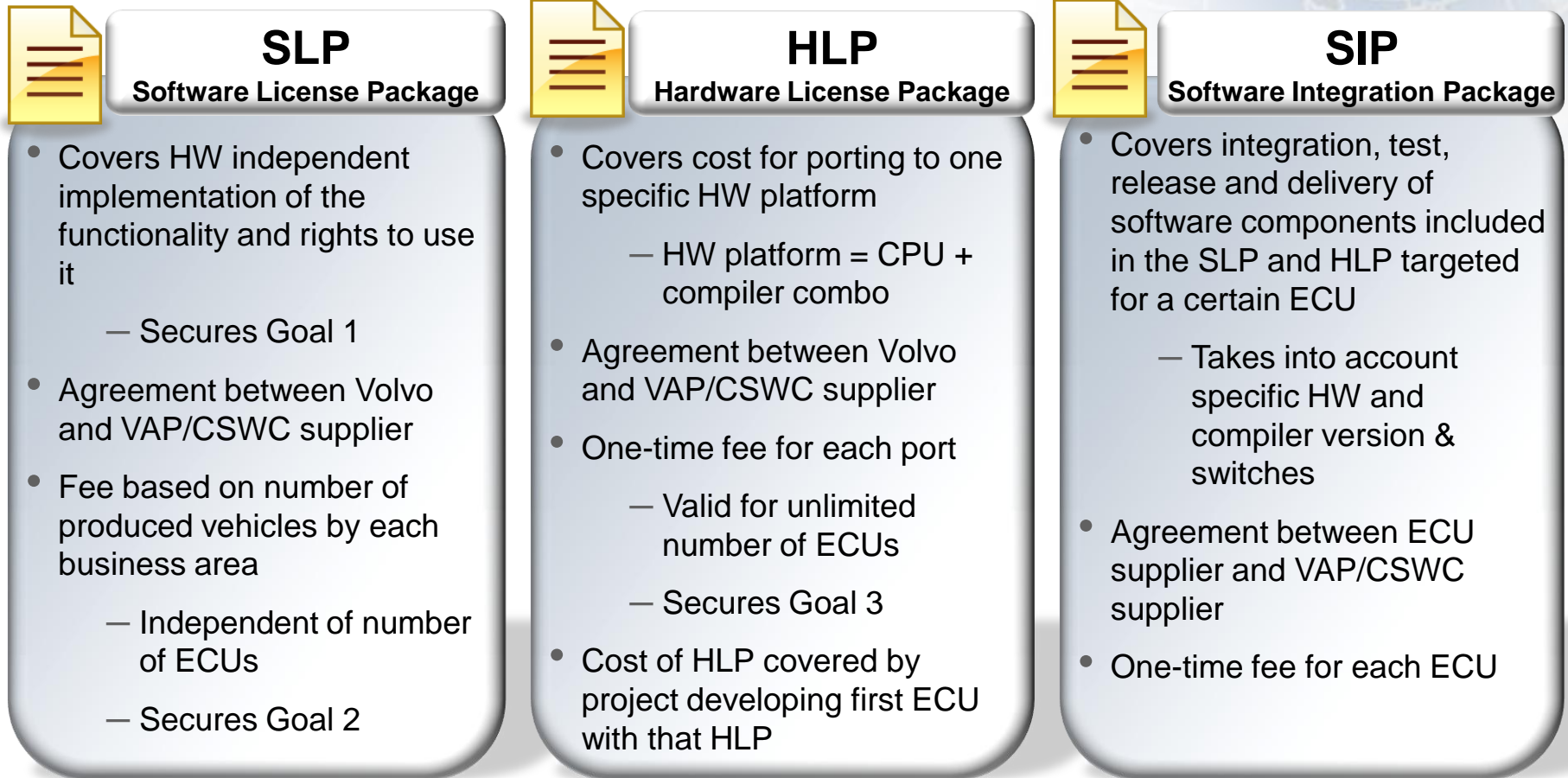


License cost based on number of produced vehicles, rather than number of ECUs



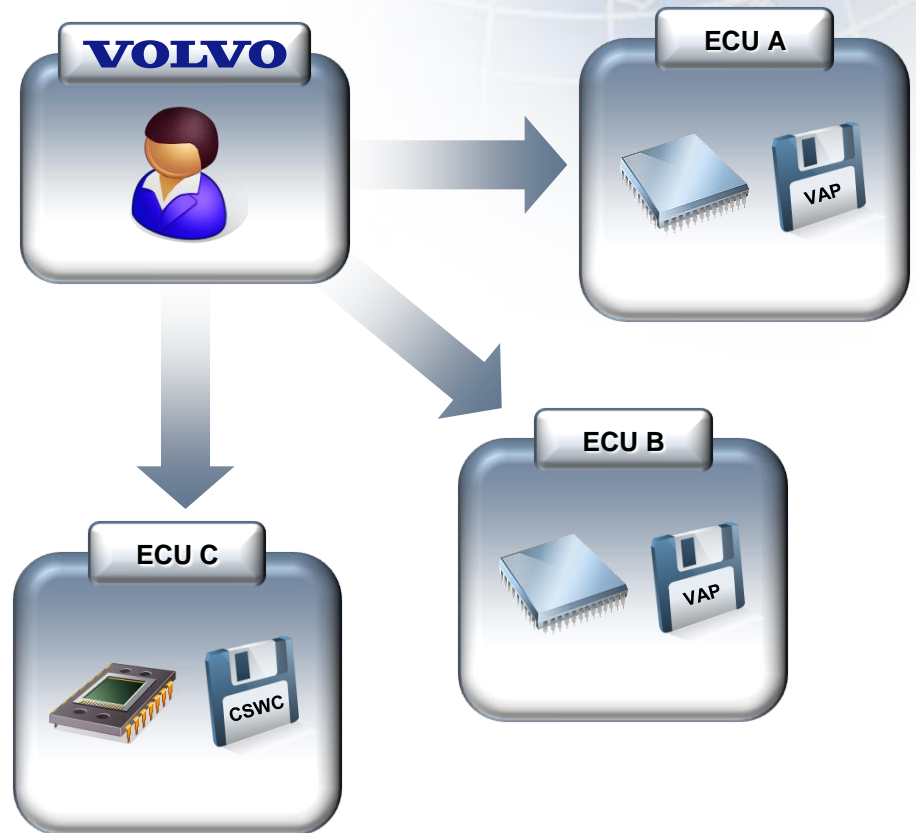
Include incentive for commonality in system solutions to reduce costs

# VAP/CSWC supplier business model in three parts

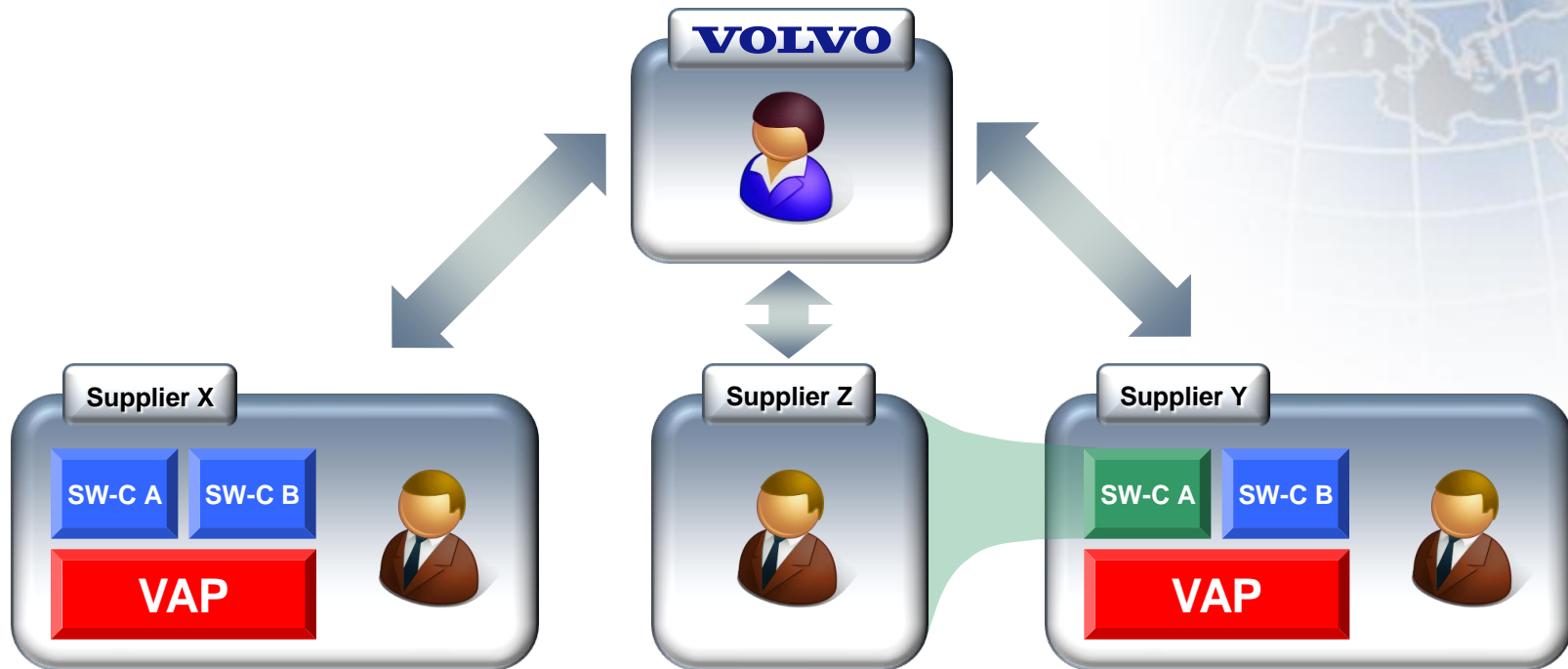


# System control strategies

- Volvo approves all use of VAP or CSWC for each ECU
  - Enables Volvo to control system functions and provides opportunity to plan for future reuse of both functions and ECUs
- Volvo decides which CPU to use in each ECU
  - Enables Volvo to reduce costs by limiting the number of required HLPs

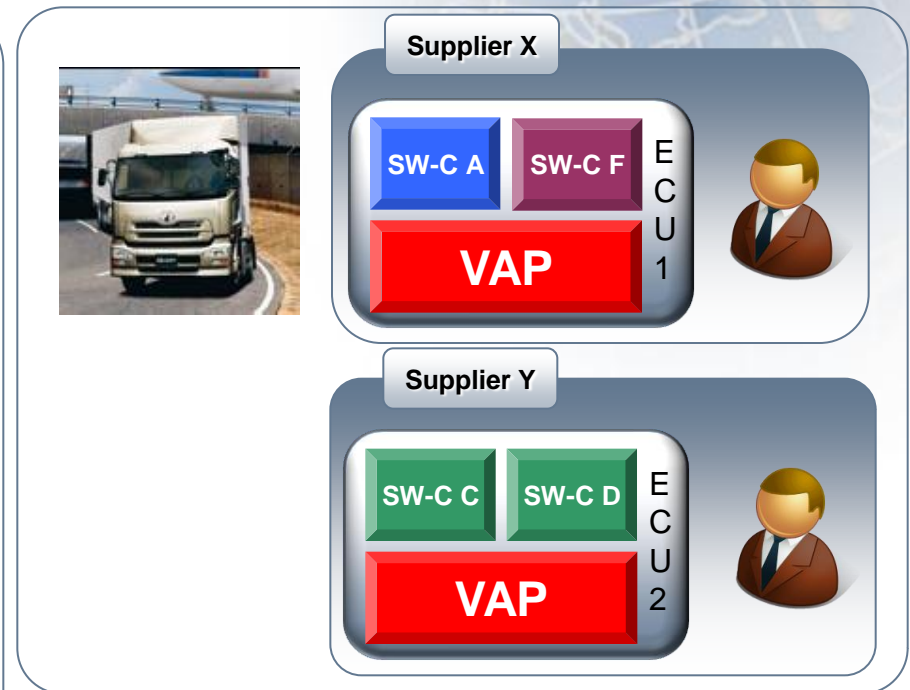
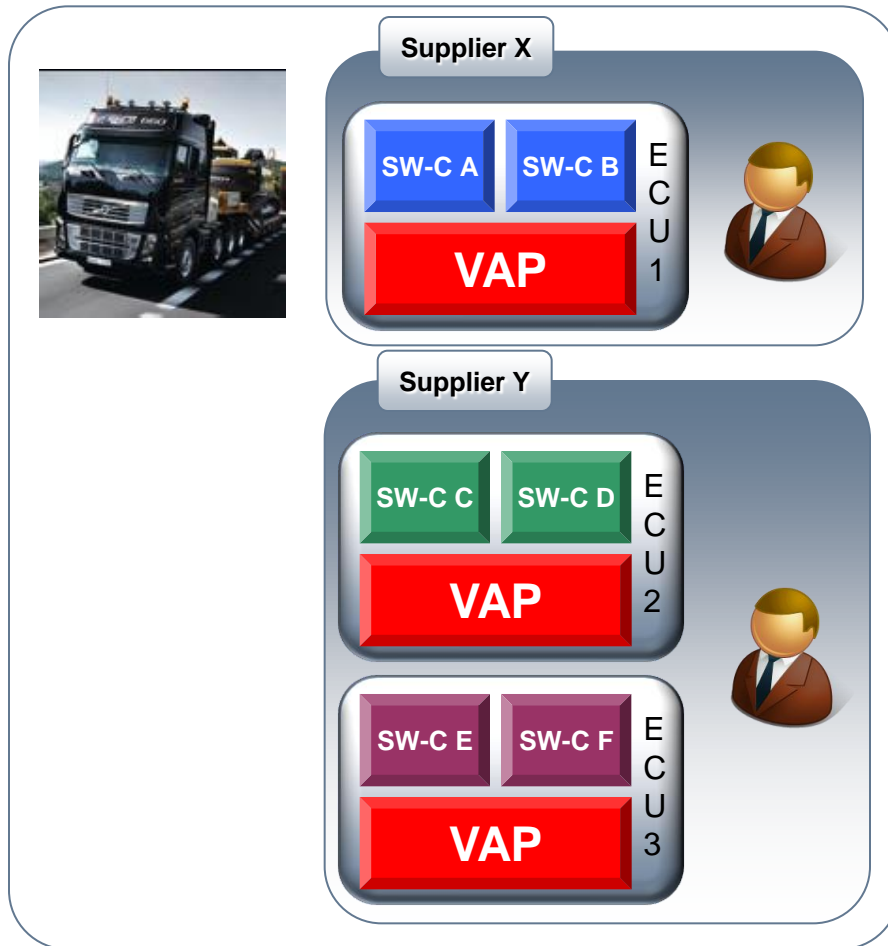


# ECU supplier business model



- Supplier X is a Tier 1 supplier and delivers the complete ECU to Volvo
  - Agreement established with Volvo
- Supplier X shall deliver and take responsibility for the software as a product
  - SW-Cs shall be reusable in other VAP ECUs in future platforms
  - Ensure requirements fulfillment
  - Integration responsibility (everything shall work together)
- Supplier Y is a Tier 1 supplier and delivers the complete ECU to Volvo
  - Agreement established with Volvo
- Supplier Z delivers SW-Cs integrated in the ECU delivered by Supplier Y
  - Agreement established with Volvo, includes terms for delivery to Supplier Y
  - Supplier Z has responsibilities for requirements fulfillment
- Supplier Y has the same responsibilities as Supplier X
  - Supplier Y does **not** have responsibility for requirements fulfillment of SW-Cs from Supplier Z

# ECU supplier business model - reusability



- Supplier Y delivers SW-C F integrated in the ECU1 delivered by Supplier X
  - Supplier Y still have the responsibilities for requirement fulfillment of SW-C F
- Supplier X has the responsibility to deliver the complete ECU1
  - Integration responsibility (everything shall work together)
  - Supplier X does **not** have responsibility for requirements fulfillment of SW-C F

# Effect of AUTOSAR on Volvo

- Cost Savings
  - AUTOSAR enable separation of hardware and software development and procurement
  - Standardized formats enables more competition and specialization from suppliers
  - For OEM developed ECUs the platform software only have to be implemented once and used in all ECUs
  - AUTOSAR enable the flexibility to scale the system to different business areas

# Effect of AUTOSAR on Volvo

- Cost Savings
- Quality Improvements
  - Reuse of platform and generic SWCs will increase the quality
  - AUTOSAR VFB enables early verification of the application in simulated environment

# Effect of AUTOSAR on Volvo

- Cost Savings
- Quality Improvements
- Time To Market
  - The use of a platform will shorten the time to reach the right quality
  - Reuse of software will shorten lead-time for both development and verification

# Effect of AUTOSAR on Volvo

- Cost Savings
- Quality Improvements
- Time To Market
- Volvo can focus on application development instead of infrastructure
- System design role is of high importance

# Effect of AUTOSAR on Volvo's suppliers

- Suppliers can get businesses of varying sizes
  - Previously, a supplier had to deliver hardware and all software for an ECU
  - With AUTOSAR, a supplier can deliver
    - Only hardware
    - Application software (SW-Cs) to be integrated by someone else
    - Integration responsibility for an ECU or subsystem, possibly including hardware and software from other suppliers
    - ...

# Effect of AUTOSAR on Volvo's suppliers

- Suppliers can get businesses of varying sizes
- Suppliers have to adapt the business models
  - How to get paid when delivering software without hardware?
  - Which terms and conditions apply when an OEM uses the software in an "unknown" environment?

# Volvo 3P in the forefront of innovation



**VOLVO**