

# PopcornSAR Introduction

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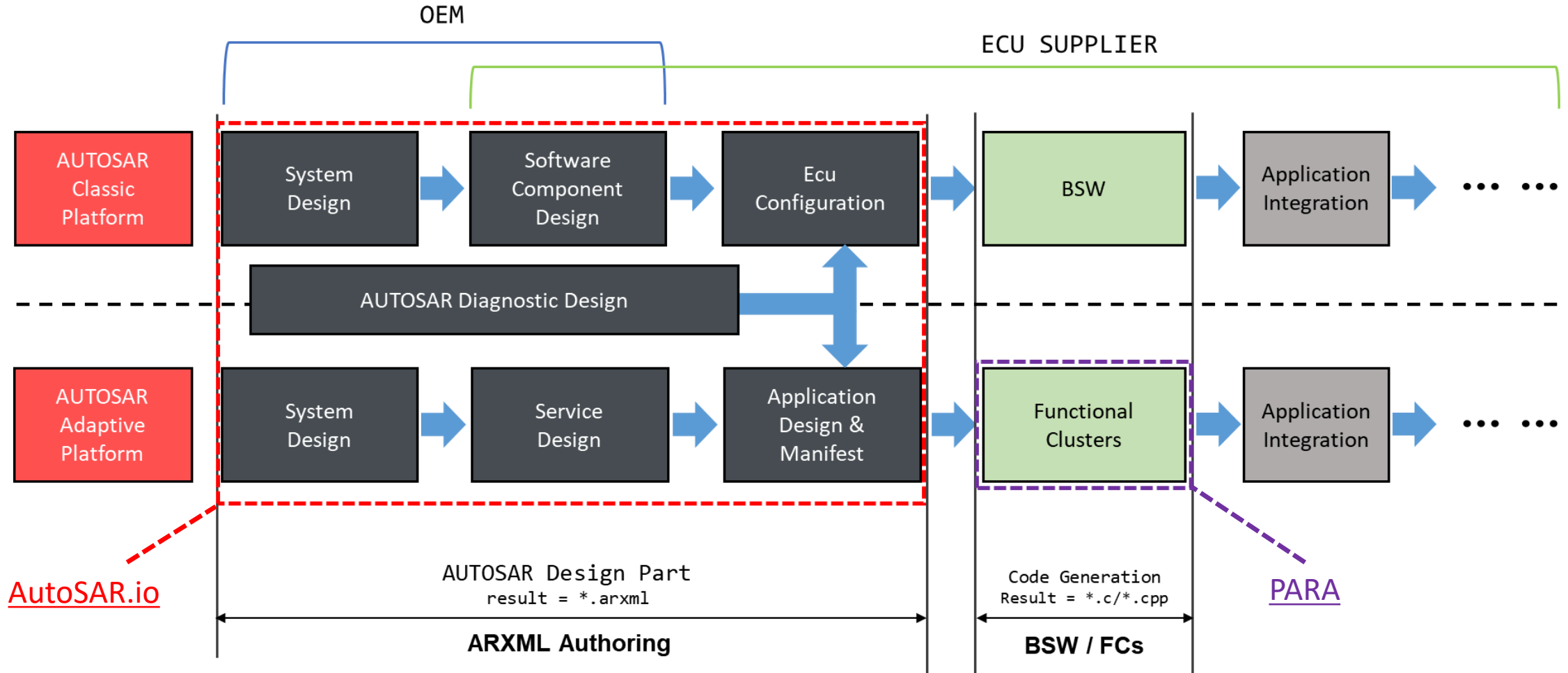
Wechat : Yonzzz

# 1. 公司概况

公司名	PopcornSAR Co., Ltd. (POPCORN System ARchitecture)	CEO	Kim, Robert (Kaphyun)
成立日期	2014. 12. 23	官网	<a href="http://www.autosar.io">www.autosar.io</a>
公司地址	韩国总部 : 6F, 432-6, Eonju-ro, Gangnam-gu, Seoul (HQ) 日本分支 : GSsakaе Bld.3F, 5-26-39, Sakaе, Naka-ku Nagoya-shi, Aichi (Subsidiary : PopcornSAR Japan)		
业务领域	AUTOSAR Adaptive Platform Tool & AUTOSAR Engineering Service		
Milestone	<ol style="list-style-type: none"><li><b>AUTOSAR Development Partner</b><ul style="list-style-type: none"><li>WG-AP-ST 成员</li><li>PopcornSAR的 ARXML工具用于AUTOSAR标准化工作。</li></ul></li><li><b>主要客户</b> : Toyota, Denso, ASIN(日本)、AVL(德国)、华为(中国)、LG电子(韩国)</li><li><b>主要产品(Adaptive AUTOSAR工具)</b><ul style="list-style-type: none"><li>AutoSAR.io (arxml tool)</li><li>PARA (Functional Clusters)</li></ul></li><li><b>技术合作伙伴</b><ul style="list-style-type: none"><li>AUBASS(日本)、卡斯基(俄罗斯)、OSB(德国)、Tech Mahindra(印度)</li></ul></li><li><b>工程服务</b> : AUTOSAR 咨询 &amp; 实现</li></ol>		

# 2. PopcornSAR 主要产品

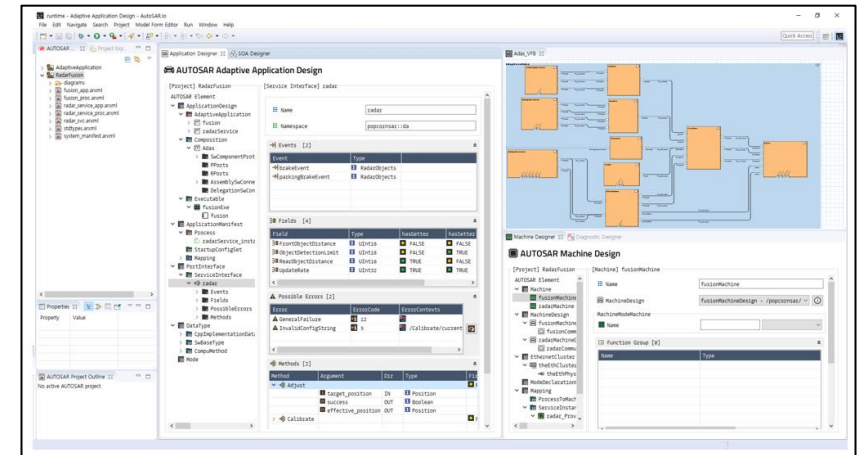
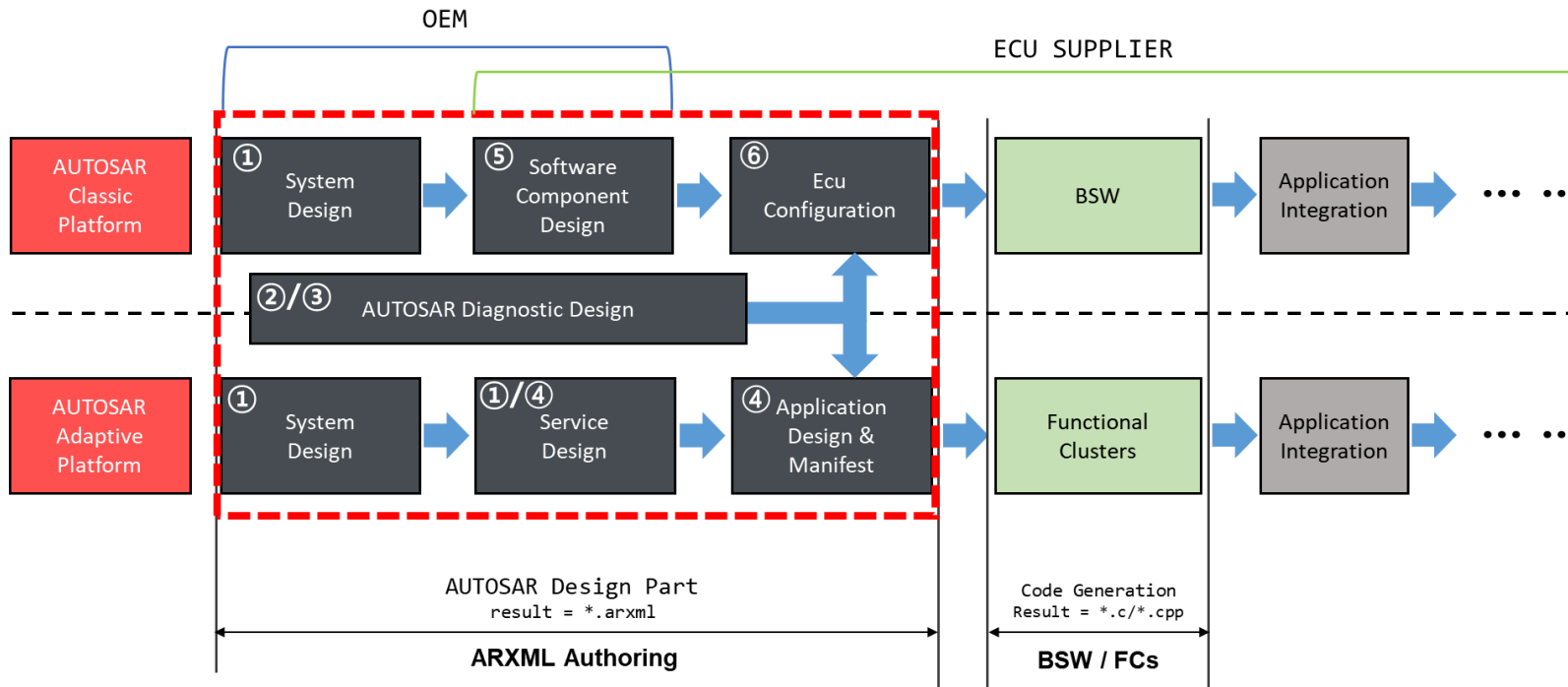
PopcornSAR 提供 ARXML 建模工具及 Functional Clusters.



## AutoSAR.io (1) : One single tool for ARXMLs

- AutoSAR.io 支持所有 AUTOSAR 建模需求。

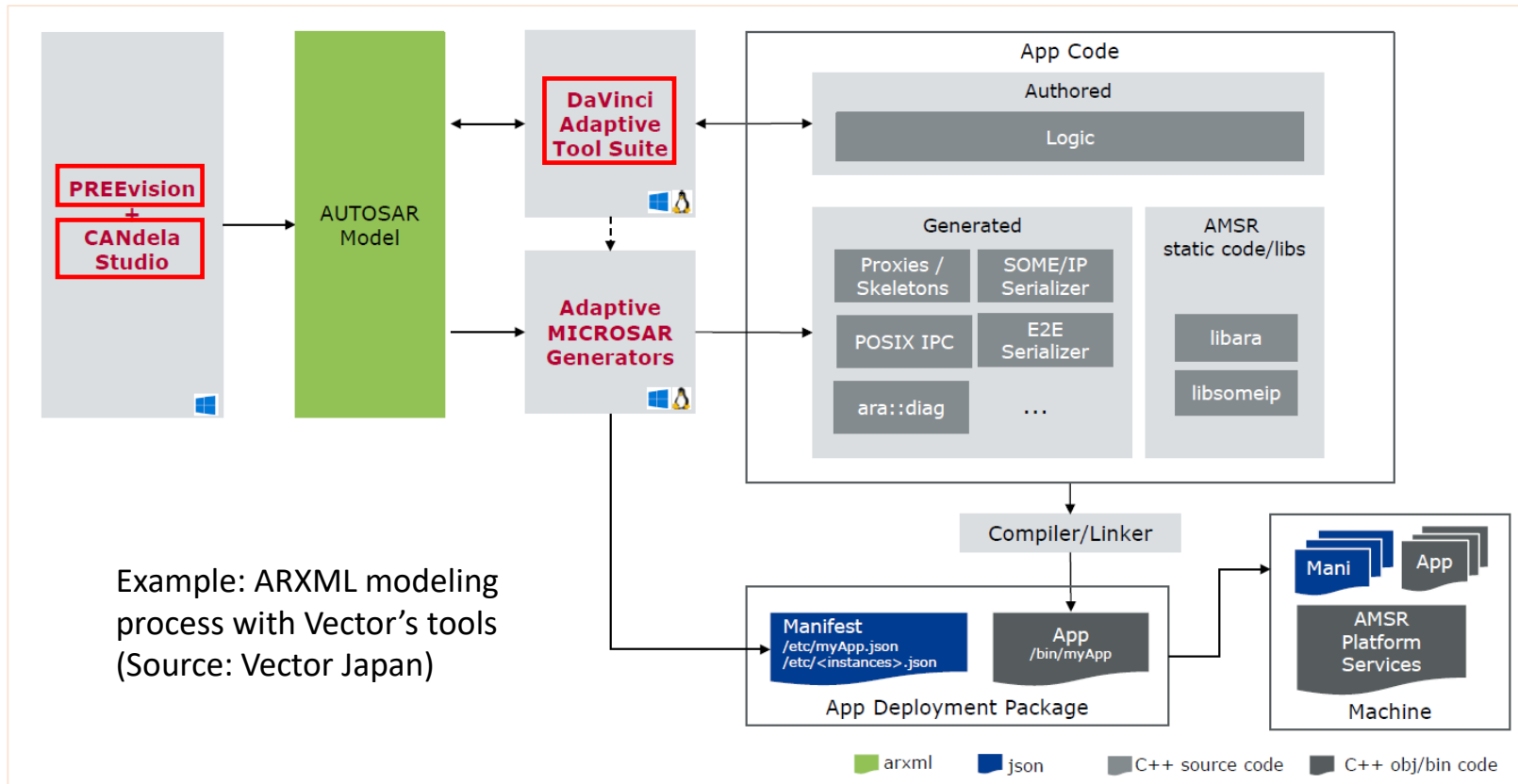
- **AUTOSAR ver.**
  - CP & AP R19-11
  - CP & AP R20-11 (July, 2021)
- **OS Support – Windows, Linux**
- **Node Lock Licensing Type**
  - HW (USB)
  - SW (Serial No.)



[点击查看视频 \(Youtube\)](#)

## AutoSAR.io (1) : One single tool for ARXMLs

- 其他工具供应商: 开发者需要组合不同的 arxml 工具来设计 Adaptive Platform ARXML。
- PopcornSAR: 一份AutoSAR.io即可享受所有 Adaptive Platform ARXML 设计功能。



## AutoSAR.io (2) : Composition of Designers

No	Category	AP/CP	Common		AP Part		CP Part	
			① System Design	② ISO14229-1(UDS)	③ Diagnostic Interface	④ App. Design & Manifest	⑤ Software Component Design	⑥ ECU Configuration
1	AUTOSAR System Designer	AP/CP	O					
2	AUTOSAR Diagnostic Designer	AP/CP		O	O			
3	AUTOSAR ECU Resource Designer	AP/CP	O					
4	AUTOSAR Data Type Designer	AP/CP	O			O	O	
5	Adaptive Sub-System Designer	AP	O			O		
6	Adaptive Service Designer	AP	O			O		
7	Adaptive Machine Designer	AP				O		
8	Adaptive Application Designer	AP				O		
9	Adaptive Execution Designer	AP				O		
10	Adaptive Package Designer	AP				O		
11	Software Component Designer	CP					O	
12	ECU Configurator	CP						O
13	AUTOSAR Document	AP/CP	O	O	O	O	O	O

## AutoSAR.io (3) : Description of Designers

- 共计13种Designer支持满足AUTOSAR开发方法论的Meta-Class设计。

No.	Editor Name	Platform	Description
1	AUTOSAR System Designer	CP/AP	AUTOSAR System Designer can design physical network, abstract software architecture and system requirements of system or ECU based on AUTOSAR “System” meta class. The meta class, which can be designed by AUTOSAR System Designer, is based on AUTOSAR_TPS_SystemTemplate.
2	AUTOSAR Diagnostic Designer	CP/AP	With help from AUTOSAR Diagnostic Designer, developer can design vehicle diagnostic services and Diagnostic Interface of Adaptive Platform which are based on ISO14229 UDS for AUTOSAR system and ECU. The meta classes, which can be designed by AUTOSAR Diagnostic Designer, are based on AUTOSAR_TPS_DiagnosticExtract.
3	AUTOSAR ECU Resource Designer	CP/AP	AUTOSAR ECU Resource Designer designs Hardware unit which can be defined by AUTOSAR. The meta classes, which can be designed by AUTOSAR ECU Resource Designer, are based on AUTOSAR_TPS_EcuResourceTemplate.
4	AUTOSAR Data Type Designer	CP/AP	AUTOSAR Data Type Designer provides designing features for various datatype, including Application Data Type for system requirements, Implementation Data Type for Classic Platform, and Cpp Implementation Data Type for Adaptive Platform.
5	Adaptive Sub-System Designer	AP	Adaptive Sub-System Designer provides features of Software Cluster Design and Process Design for sub-system designing of AUTOSAR Adaptive Platform.
6	AUTOSAR Service Designer	AP	Adaptive Service Designer supports designing of main meta classes of Service Oriented Architecture in AUTOSAR Adaptive Platform. It provides designing features for 1) Service Interface, 2) service distribution based on SOME/IP, DDS, IPC, and 3) Service Instance.

## AutoSAR.io (3) : Description of Designers

No.	Editor Name	Platform	Description
7	AUTOSAR Machine Designer	AP	Details of Machine of AUTOSAR Adaptive Platform and Functional Clusters which are specially defined in the specifications (PHM, PER, TSYNC, for example) can be designed through Adaptive Machine Designer.
8	Adaptive Application Designer	AP	Adaptive Application Designer of AutoSAR.io provides designing features for Executable and Adaptive Application Software Component of AUTOSAR Adaptive Platform. Adaptive Application Designer can also help developer design mapping of related meta classes to allocate user-defined services to PortPrototype.
9	Adaptive Execution Designer	AP	Adaptive Execution Designer can set up Process and Startup of AUTOSAR Adaptive Platform.
10	Adaptive Package Designer	AP	Adaptive Package Designer supports designing of Software Cluster, Software Package and Vehicle Package for software distribution.
11	Software Component Designer	CP	Software Component Designer can design Atomic Software Component and Port Interface of AUTOSAR Classic Platform. The meta classes, which can be designed by Software Component Designer, are based on AUTOSAR_TPS_SoftwareComponentTemplate.
12	Ecu Configurator	CP	Ecu Configurator, which is based on AUTOSAR_TPS_ECUConfiguration, is a special editor for ECU Configuration of AUTOSAR Classic Platform. Module Definition ARXML needs to be imported to the project to use ECU Configurator. Developer can import AUTOSAR STMD (STandard Module Definition) or VSMD (Vendor Specific Module Definition) to set up BSW according to Module Definition.
13	AUTOSAR Document	AP	AUTOSAR Document is used for editing “Documentation” meta class for additional documents except designing meta classes.



## AutoSAR.io (4) : Spread sheet type GUI

- 直观的图示化操作界面带来更高的开发效率。

**AUTOSAR System Designer**

[Project] SYSTEM

AUTOSAR Element

- SystemDesign
  - System
    - SYSTEM
      - VFB
      - Mappings
    - Composition
    - InterfaceMapping
    - State
    - Pnc
    - Topology
      - Machine
        - Machine
        - Gateway
        - Ecu
          - Ecu
          - Connection
            - Ethernet
              - EthernetCluster
              - Switch
                - Can
                - NetworkManagement
                - GlobalTimeDomain
                - ServiceInstance
              - Protocol
                - SecureCommunication
                  - Property
                  - CryptoService
                - Signal
                  - SystemSignal
                  - ISignal
                  - Pdu
                - DataTransformation
                  - SOME/IP

[Ethernet Cluster] EthernetCluster

Configurations

| EthernetPhysicalChannel | Category                             | Vlan |
|-------------------------|--------------------------------------|------|
| PhysicalChannel         | WIRED                                | VLAN |
| CommConnector           |                                      |      |
| ConnectedConnector      | [ECU]Ecu::EthConn                    |      |
| ConnectedConnector      | [MACHINE]Machine::eth0               |      |
| NetworkEndpoint         |                                      |      |
| NE_Ecu_EthConn          |                                      | 4    |
| NetworkEndpointAddress  |                                      |      |
| Ipv6Address             | 2001:db8:85a3:8d3:1319:8a2e:370:7348 |      |
| Ipv6AddressSource       | FIXED                                |      |
| DefaultRouter           | -                                    |      |
| HopCount                |                                      |      |
| EnableAnycast           | -                                    |      |
| IpAddressPrefixLength   |                                      |      |
| AssignmentPriority      | 5                                    |      |
| IpAddressKeepBehavior   | -                                    |      |
| InfrastructureServices  |                                      |      |
| IPSecConfig             |                                      |      |
| NE_Machine_Etho         |                                      | 0    |
| NE_Multicast_SD         |                                      | -    |
| SocketAdapter           |                                      |      |
| SoAdConfig              |                                      |      |
| SocketAddress           |                                      |      |
| SoAD_Ecu_EthConn        | [ECU]Ecu::EthConn                    | -    |
| MulticastConnector      |                                      |      |
| SocketOptions           |                                      |      |
| ApplicationEndpoint     |                                      |      |
| AE_EcuApp_9087          | 2001:db8:85a3:8d3:1319:8a2e:370:7348 | 4    |
| TpConfiguration         |                                      |      |
| UdpTpPort               | 9087                                 | -    |
| SD-Options              |                                      |      |
| FrameTriggering         |                                      |      |
| PduTriggering           |                                      |      |
| ISignalTriggering       |                                      |      |

[Ethernet Cluster] ETHCluster\_CarArch

Configurations

| Physical Channels         | Coupling Port Connections | Mac | Multicast Groups |
|---------------------------|---------------------------|-----|------------------|
| IPSecConfig               | IPSecConfigProps          |     |                  |
| PhysicalChannel           | WIRED                     |     | UNTAGGED         |
| CommConnector             |                           |     |                  |
| ConnectedConnector        | [MACHINE]Machine::eth0    |     |                  |
| NetworkEndpoint           |                           |     |                  |
| NetworkEndpoint_etho      |                           |     |                  |
| NetworkEndpointAddress    |                           |     |                  |
| Ipv6Address               | 192.168.0.7               |     |                  |
| Ipv6AddressSource         | FIXED                     |     |                  |
| DefaultGateway            |                           |     |                  |
| NetworkMask               |                           |     |                  |
| Ttl                       |                           |     |                  |
| AssignmentPriority        |                           |     |                  |
| IpAddressKeepBehavior     |                           |     |                  |
| DnsServerAddresses        |                           |     |                  |
| InfrastructureServices    |                           |     |                  |
| IPSecConfig               |                           |     |                  |
| IPSecConfig               |                           |     |                  |
| NetworkEndpoint_multicast |                           |     |                  |
| SocketAdapter             |                           |     |                  |
| FrameTriggering           |                           |     |                  |
| PduTriggering             |                           |     |                  |
| ISignalTriggering         |                           |     |                  |

| Class                            | Package  | Note  | Base  |   |
|----------------------------------|--|---|---|---|
| <<atpVariation>> EthernetCluster | M2-AUTOSARTemplates::SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology | Ethernet-specific cluster attributes.<br><b>Tags:</b><br>atp.ManifestKind=MachineManifest<br>atp.recommendedPackage=CommunicationClusters | ARObject, CollectableElement, CommunicationCluster, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable |   |
| Attribute                        | Type   | Mult.   | Kind  | Note  |
| couplingPort Connection          | CouplingPort Connection  | *   | aggr  | Specification of connections between CouplingElements and ECUInstances.<br><b>Stereotypes:</b> atp.Splittable; atp.Variation<br><b>Tags:</b><br>atp.Splitkey=couplingPortConnection, variationPoint.shortLabel.vh.latestBindingTime=postBuild |
| couplingPort SwitchoffDelay      | TimeValue  | 0.1   | attr  | Switch off delay for CouplingPorts in seconds. It denotes the delay of switching off couplingPorts after the request to switch off a couplingPort was issued. (e.g. switch off of Ethernet switch ports).                                     |
| macMulticast Group               | MacMulticastGroup  | *   | aggr  | MacMulticastGroup that is defined for the Subnet (EthernetCluster).   |

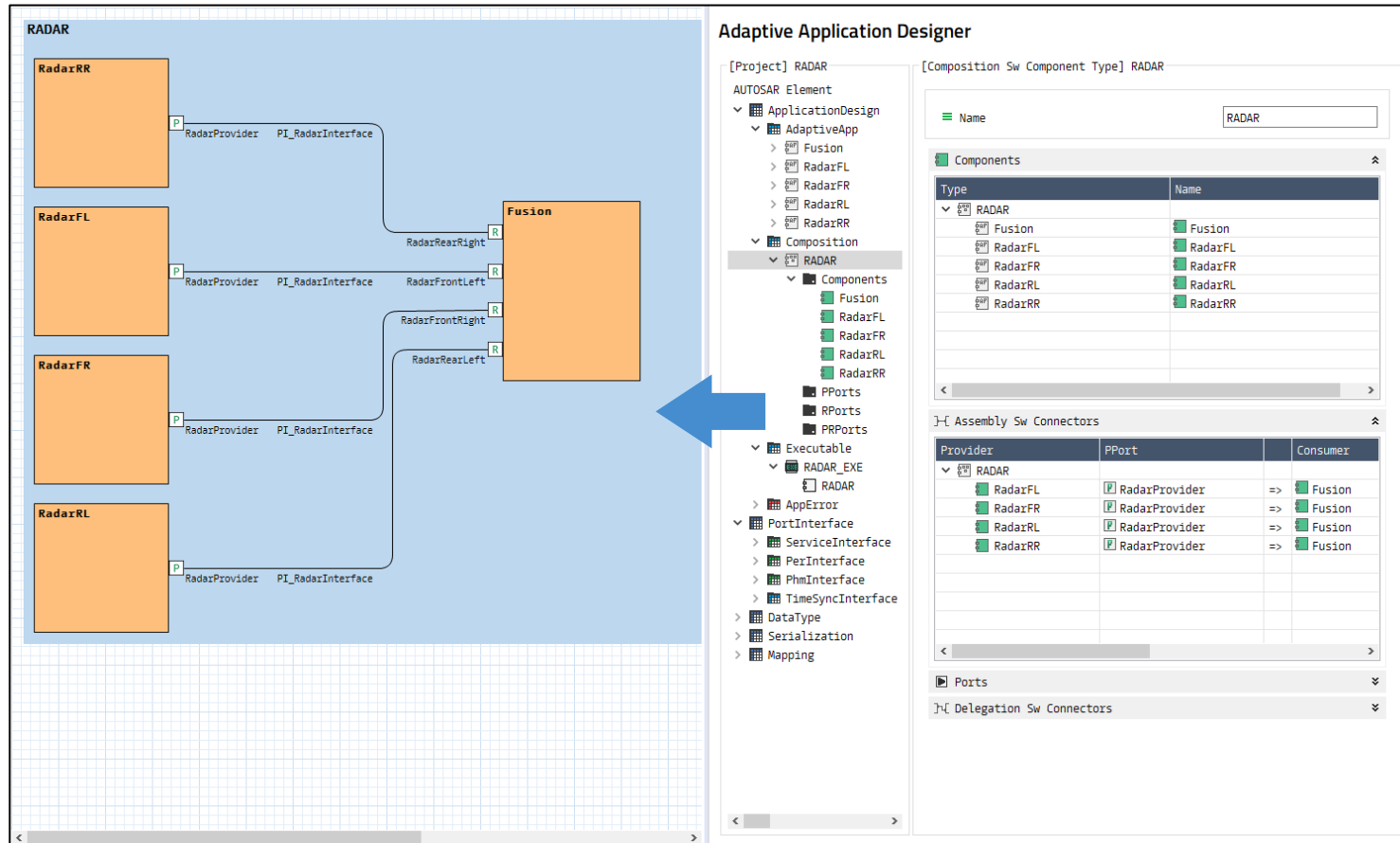
**Table 3.46: EthernetCluster**

| Class  | Package   | Note   | Base  |  |
|--|---|--|---|--|
| <<atpVariation>> CommunicationCluster (abstract) | M2-AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreTopology                 | The CommunicationCluster is the main element to describe the topological connection of communicating ECUs.<br>A cluster describes the ensemble of ECUs, which are linked by a communication medium of arbitrary topology (bus, star, ring, ...). The nodes within the cluster share the same communication protocol, which may be event-triggered, time-triggered or a combination of both.<br>A CommunicationCluster aggregates one or more physical channels.<br><b>Tags:</b> vh.latestBindingTime=postBuild | ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable |  |
| Subclasses                                       | AbstractCanCluster, EthernetCluster, FlexrayCluster, LinCluster, UserDefinedCluster |  |   |  |
| Attribute  | Type  | Mult.  | Kind  | Note   |
| baudrate   | PositiveUnlimitedInteger  | 0.1  | attr  | Channels speed in bits/s.  |
| physical Channel                                 | PhysicalChannel   | 1..*   | aggr  | This relationship defines which channel element belongs to which cluster. A channel shall be assigned to exactly one cluster, whereas a cluster may have one or more channels.<br><b>Stereotypes:</b> atp.Splittable; atp.Variation<br><b>Tags:</b><br>atp.Splitkey=shortName, variationPoint.shortLabel.vh.latestBindingTime=systemDesignTime |
| protocolName                                     | String  | 0.1  | attr  | The name of the protocol used.   |
| protocolVersion                                  | String  | 0.1  | attr  | The version of the protocol used.  |

**Table 3.7: CommunicationCluster**

## AutoSAR.io (5) : Composition View

- 通过composition viewer, 用户可查看 CompositionSwComponentType 架构组成。

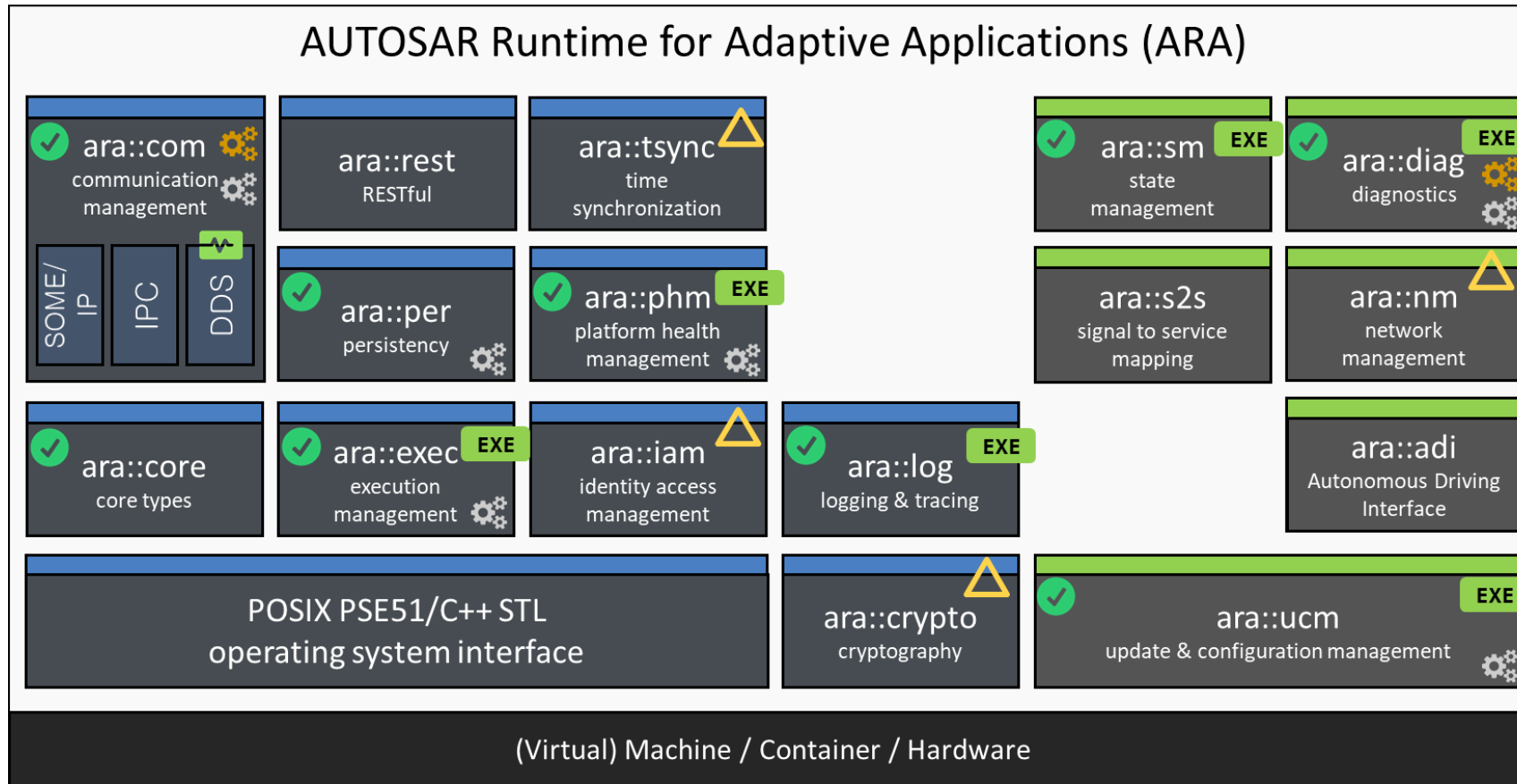


### AutoSAR.io 安装需求配置

- OS : Windows 7/8/10 或 Linux Ubuntu 18.04 (64bits)
- RAM 不低于 4GB
- 推荐使用 1920 x 1080 分辨率 (100% 缩放比率)
- Java JDK 1.8 (推荐使用 Open JDK)

# 4. PARA

## PARA : P<sub>opcornSAR</sub> A<sub>UTOSAR</sub> R<sub>untime</sub> environment for A<sub>daptive</sub> Applications



✓ Available On 3Q 2021
⚙️ C++ Source Code Generator
⚙️ Manifest Generator
EXE Platform Level Application
⚡ Further negotiation
⚠️ Need requirements

- AUTOSAR 版本: R20-11 (3Q. 2021)
- OS Support: Linux (Ubuntu 8.04)
- HW support: Nvidia, Intel, R-car, NXP (3Q. 2021)
- 销售模式
  - 可提供9个基础 FCs (com, core, exec, per, phm, log, sm, diag, ucm)
  - 根据客户需求进行配套开发 (tsync, iam, crypto)
- 产品优势
  - PopcornSAR自主研发的代码自动生成器 (Generators)
  - 适用于CI/CD的Manifest自动生成器
  - 支持ARXML validation
- 于2021年3季度提供产品试用
- PopcornSAR 可根据客户需求, 开发并提供 AA SDK。

# Thank you

Q&A : [ykang@popcornsar.com](mailto:ykang@popcornsar.com)