Specifying Services using the Service oriented architecture Modeling Language (SoaML): A baseline for Specification of Cloud-based Services

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Outline

- Short presentation of the main part of the paper
  - What is SoaML?
  - Experiences and issues
  - Illustrative example
  - Two approaches
- Ongoing and future work
  - A baseline for Specification of Cloud-based Services
  - Towards a Cloud Modeling Language (CloudML)

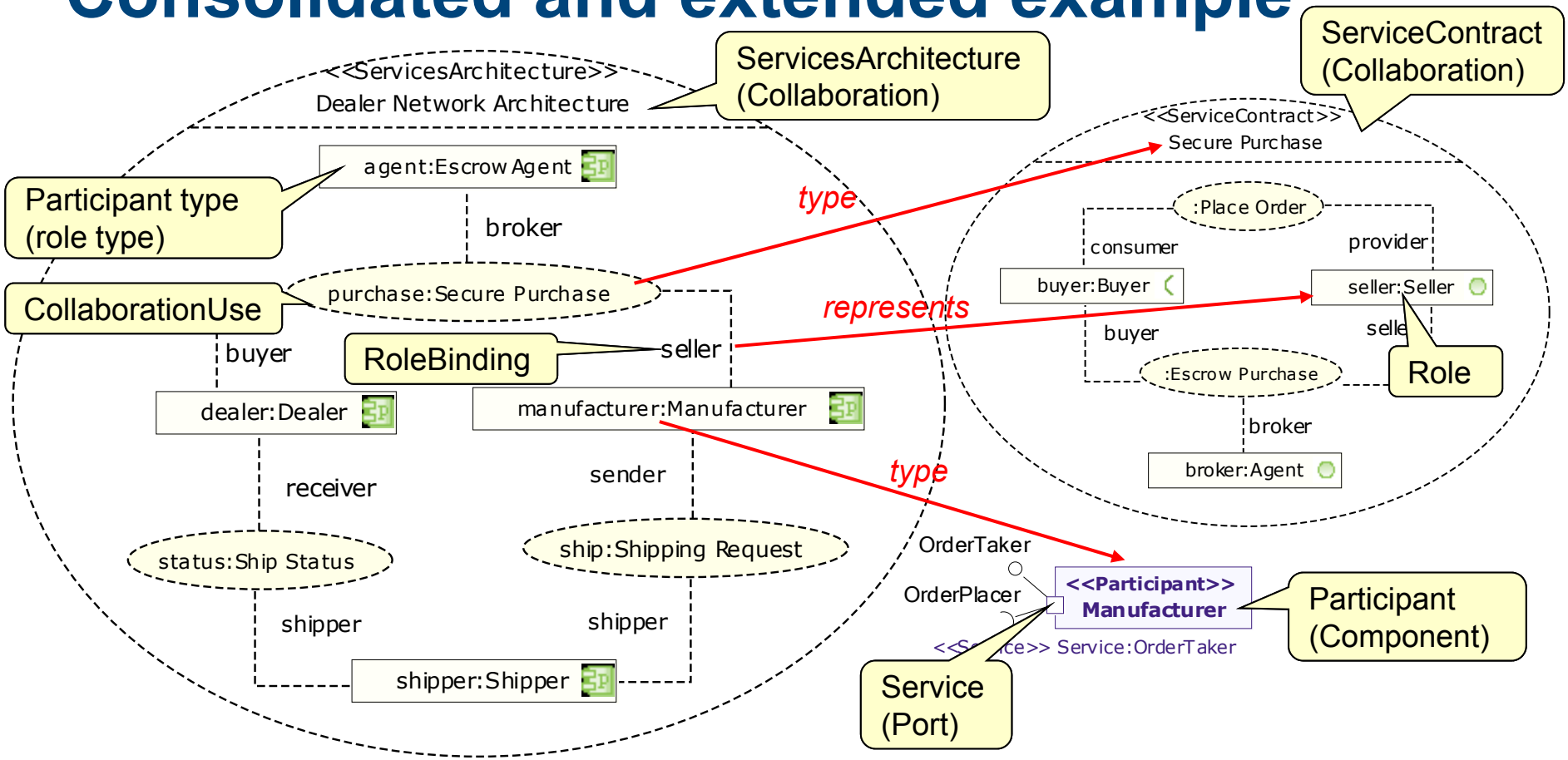
What is SoaML?

- Service oriented architecture Modeling Language (SoaML)
  - Defines language constructs and extensions to UML2 to support service concepts (metamodel and UML profile)
  - Focuses on basic service modelling concepts and structure.
  - A foundation for further extensions and integration with BPMN, BMM and other metamodels.
- Key language constructs
  - Consumer
  - MessageType
  - Participant
  - Provider
  - ServiceContract
  - ServiceInterface
  - ServicesArchitecture

SoaML experiences, identified issues and purpose of our paper

- Our experiences with SoaML
  - Tooling
  - Methods and practices
  - Application in industry projects
- Identified issues
  - Inconsistencies in the specification.
  - Two (three) main approaches to service modelling.
  - Examples illustrating the two approaches are not consistent.
  - No clear separation, the two approaches are somewhat intertwined.
  - Tool support lacking or worse wrongly implemented.
- Purpose of our paper
  - Clarify the differences and similarities between the different approaches.
  - Describe how to align the approaches.
  - Position SoaML as a baseline for specification of cloud-based services.
  - SoaML can be extended with new modelling constructs and integrated with other modelling languages.

Consolidated and extended example



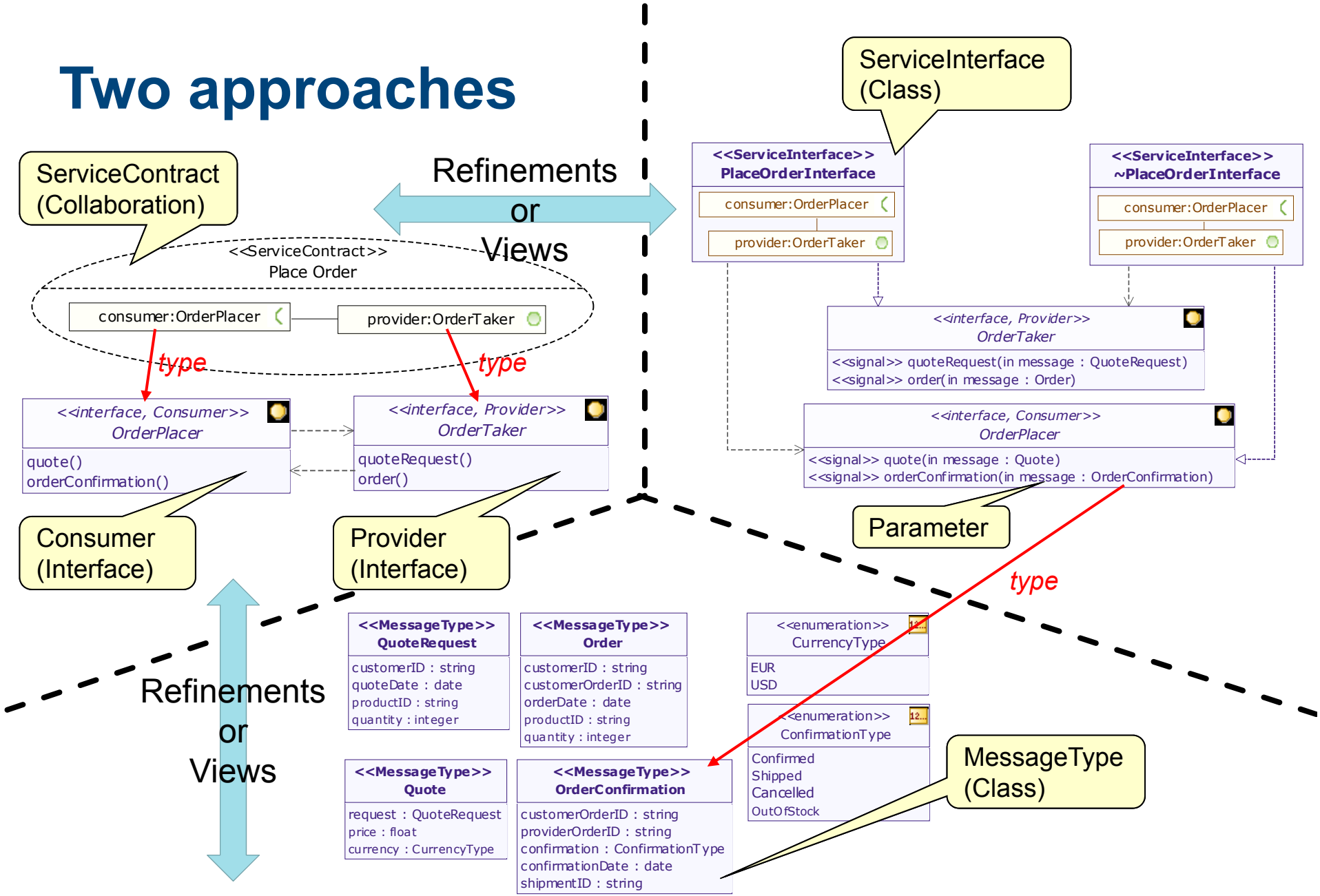
Services architecture:

- High level description of how **participants** work together for a purpose by providing and using services expressed as **service contracts**.

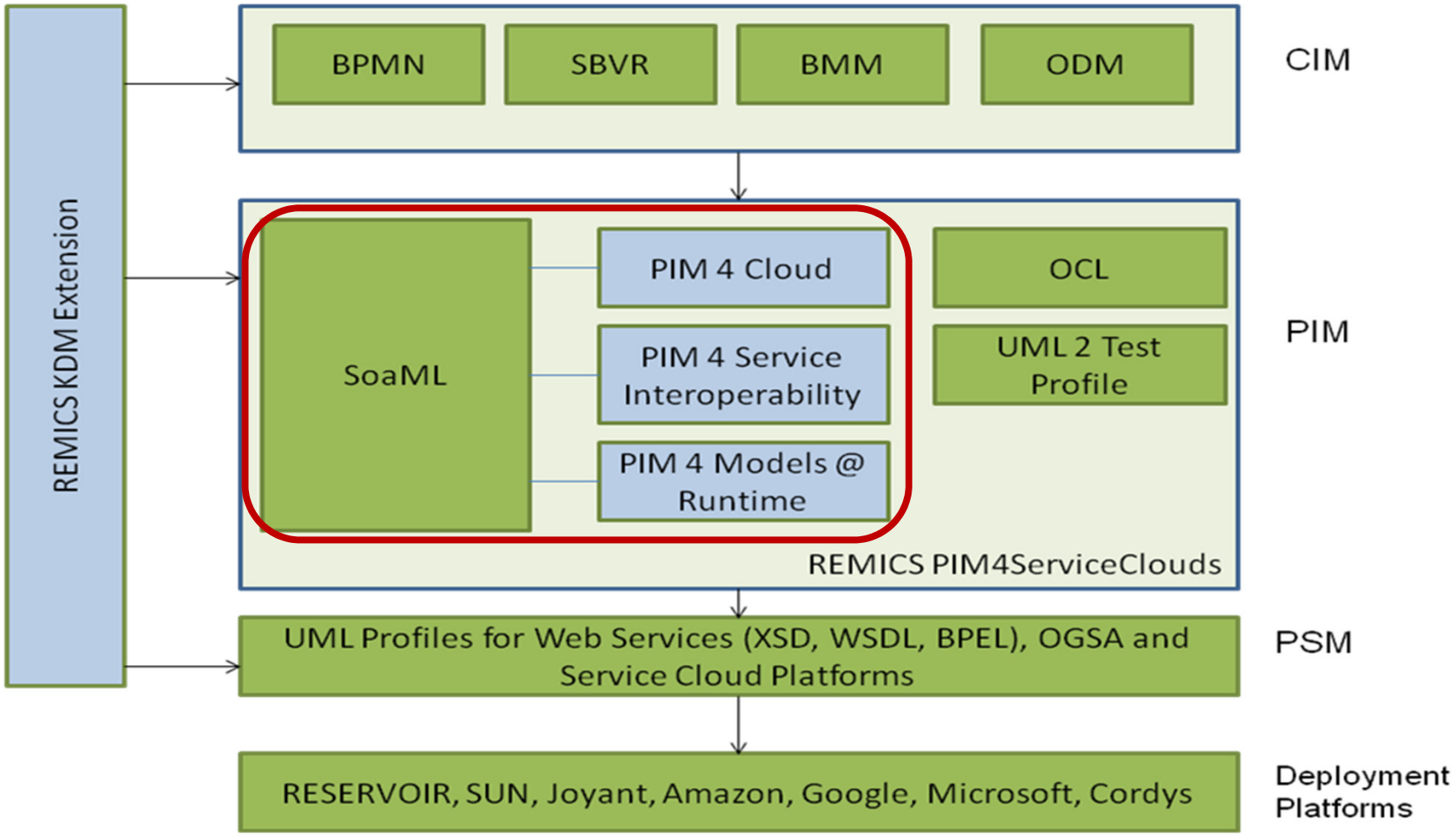
Service contract:

- Service specifications that define the **roles** each participant plays in the service and the **interfaces** they implement to play that role.

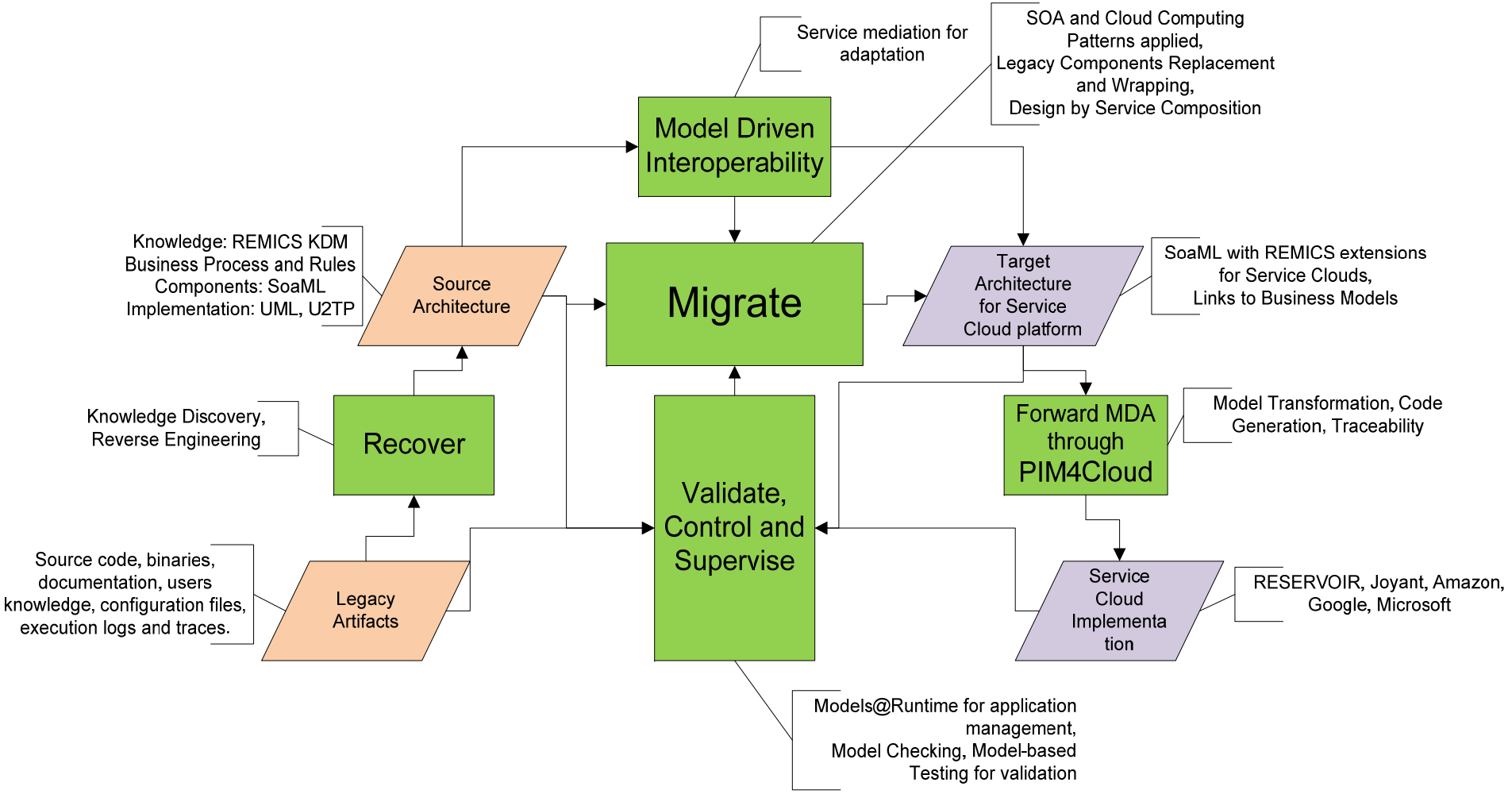
Two approaches



A baseline for Specification of Cloud-based Services in REMICS

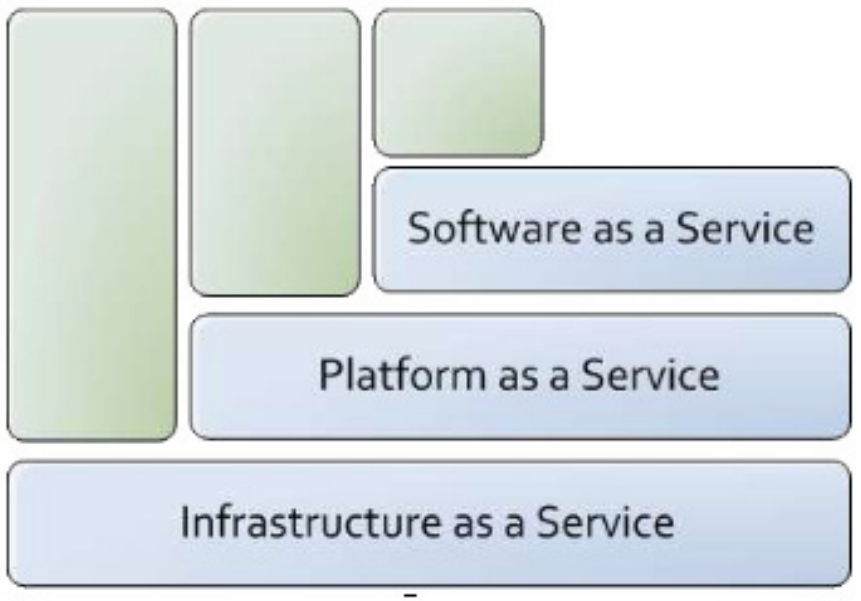


Model-Driven Migration of Legacy Applications to Service Cloud

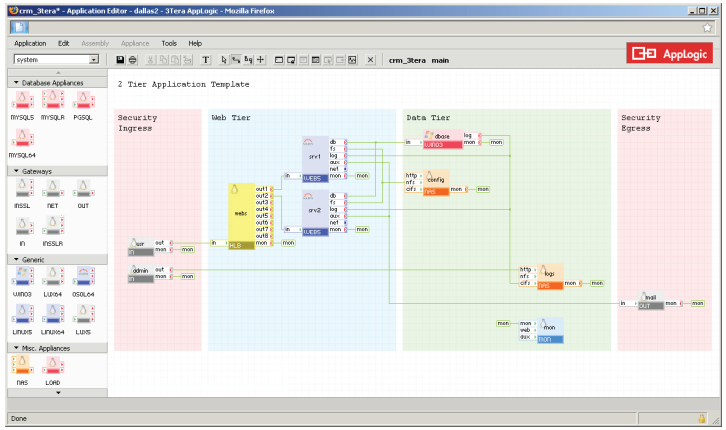


Cloud computing layers

- Cloud computing layers:
  - **Software as a Service** delivers software as a service over the Internet.
  - **Platform as a Service** delivers a computing platform and solution stack as a service.
  - **Infrastructure as a Service** delivers a platform virtualization environment as a service.
- Different issues for each layer:
  - Security
  - Quality of Service
  - Data Storage Interface
  - Client Application Interface
  - Provisioning
  - Development Platform
  - Virtual machine interface
- SoaML4Cloud (PIM4Cloud) can't address all these issues



Cloud models and languages



- We are currently looking at some interesting models and languages:
  - Amazon Cloudformation
    - a textual description language for cloud resources
    - http://aws.amazon.com/cloudformation/
  - CA 3Tera AppLogic
    - a graphical language for Cloud configuration
    - http://www.ca.com/us/cloud-management-console.aspx
  - Elastra – with DSLs for Cloud configuration
    - Elastra Cloud Modeling Language (ECML) is used to describe an application (software, requirements, and policies)
    - Elastra Deyployment Modeling Language (EDML) is used to describe the resources (virtual machines, storage, and network) available in a data center.
    - www.elastra.com

Cloud computing standardisation

Standardisation organisation	Cloud standardisation	Members
Open Grid Forum	Open Cloud Computing Interface	Microsoft, Sun, Intel, HP, AT&T, eBay, etc
Cloud Computing Interoperability Forum	Enable a global cloud computing ecosystem	Cisco, Intel, Thomson Reuters, Orange, Sun, IBM, RSA, etc
Distributed Management Task Force	Open Virtualisation Format Standard & Open Cloud Standards Incubator	IBM, Microsoft, Novell, Oracle, Sun, Vmware, EMC, etc
Open Cloud Consortium	Standards and Interoperability for Large Data & Open Cloud Testbed	Cisco, MIT Lincoln Labs, Yahoo, various colleges
Cloud Security Alliance	Best practices for providing security assurance	eBay, ING, Qualys, PGP, zScaler, etc
Storage Networking Industry Association	Storage Networking	Dell, EMC, Oracle, Juniper Networks, Qlogic, HP, Vmware, Hitachi, NetApp
Object Management Group	Modelling languages for Cloud computing	OMG members (industry consortium)

Future work: OMG standardisation goals

- Specify the REMICS SoaML4Cloud (PIM4Cloud) metamodel and profile
  - extension of the SoaML metamodel and profile
  - platform independent model
  - deployment modelling
  - support for code-generation aimed at cloud computing platforms
- Issue an OMG Request for Proposal (RFP) for CloudML
  - Focus on modelling deployment of applications & services on cloud for portability, interoperability and reuse
  - Address deployment to Cloud Platforms at the Infrastructure and Service level
  - Deployment model to specify infrastructure and QoS and SLA properties for analysis

Thanks for your attention!

- Questions?

- SoaML website:
  - http://www.soaml.org/
- SHAPE website:
  - http://www.shape-project.eu/
- NEFFICS website:
  - http://www.neffics.eu/
- REMICS website:
  - http://www.remics.eu/
- SiSaS website:
  - http://sisas.modelbased.net/