

On-demand Provisioning of Workflow Middleware and Services An Overview



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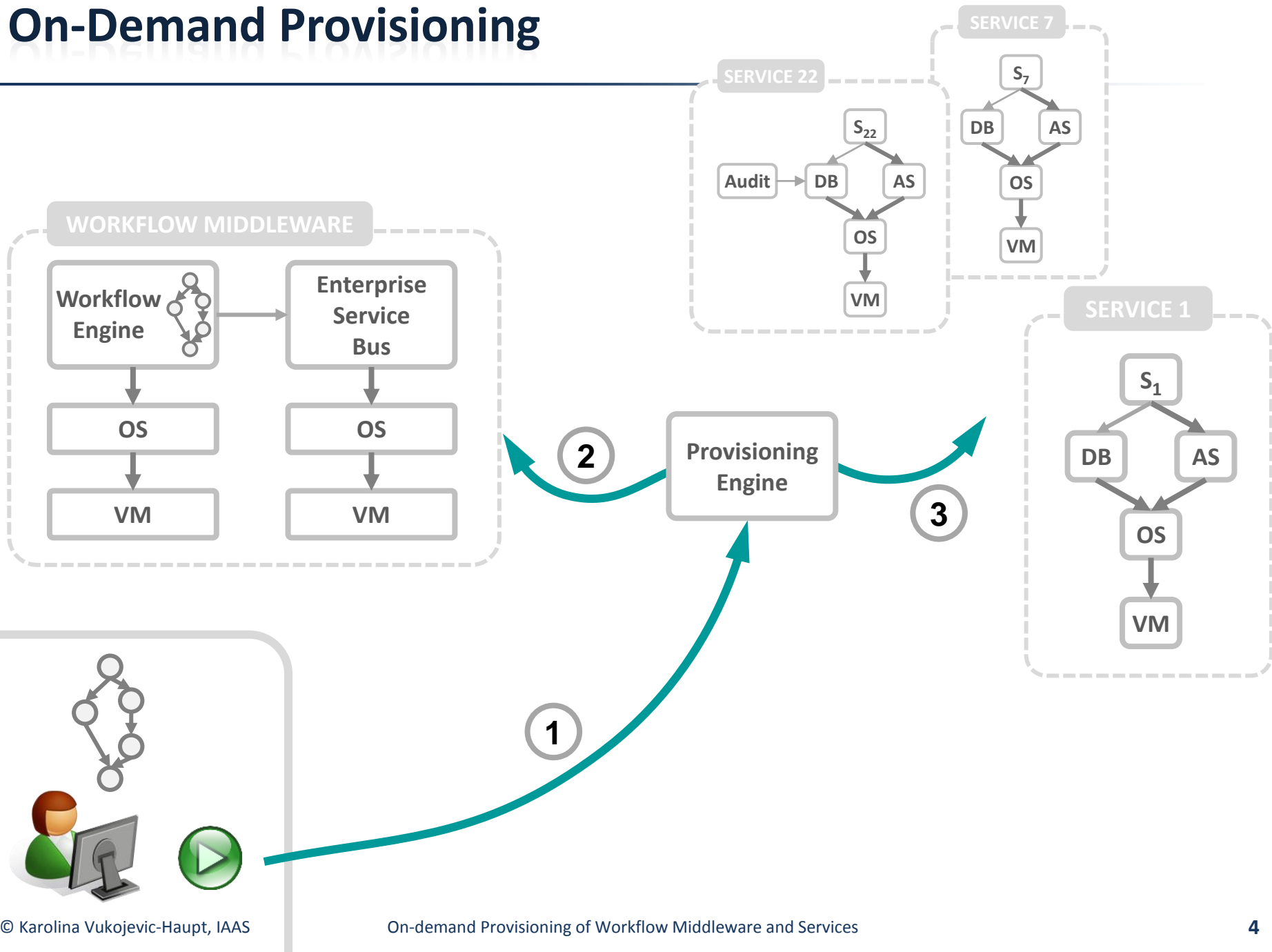
Agenda


- Motivation
- Approach for ODP
- Extended Classification of Service Binding Strategies
- Service Selection and Service Package Selection Process
- Comparison of Service Binding in SOC and ODP

Motivation

- Basic assumption in Service Oriented Computing (SOC)
 - Services always on and available
 - Suitable for production workflows in the business domain
 - Services are typically used continuously
- There are domains where services are used rarely and not regularly
 - E.g. simulation workflows in the eScience domain
 - Keeping services always on and available is a waste of resources
- Our approach to solve this problem:
 - On-demand provisioning of workflow execution middleware and services (ODP)

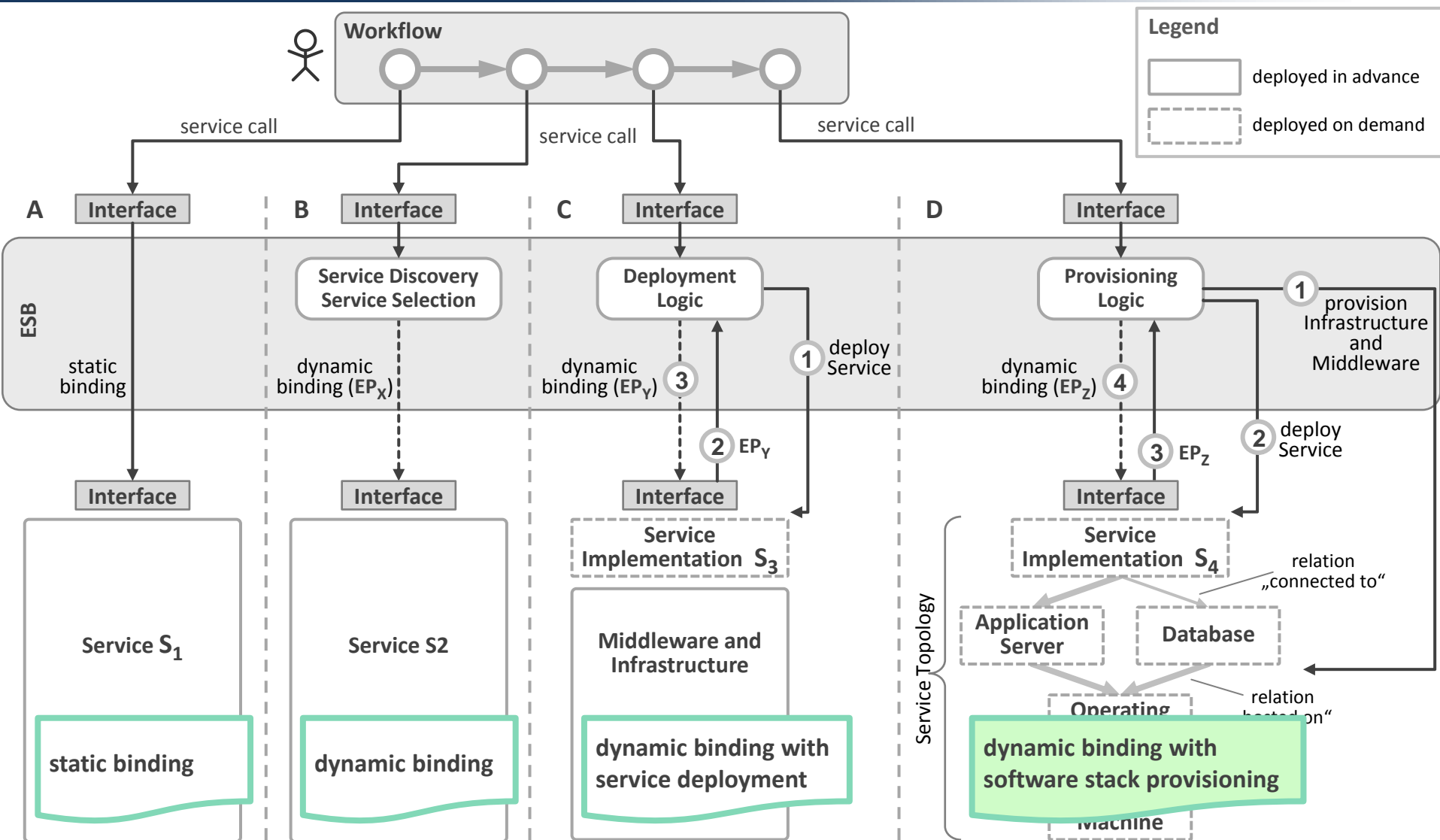
On-Demand Provisioning



- Users can run their simulation workflows in the Cloud with only one click 
 - Only modeling tool and bootware local on user's machine
 - Middleware and services are provisioned on demand
 - Exploiting cloud characteristics
 - Reuse of existing provisioning technologies
 - Optimizing resource allocation
 - Installing and running the workflow middleware and services is handled automatically and invisible in the background

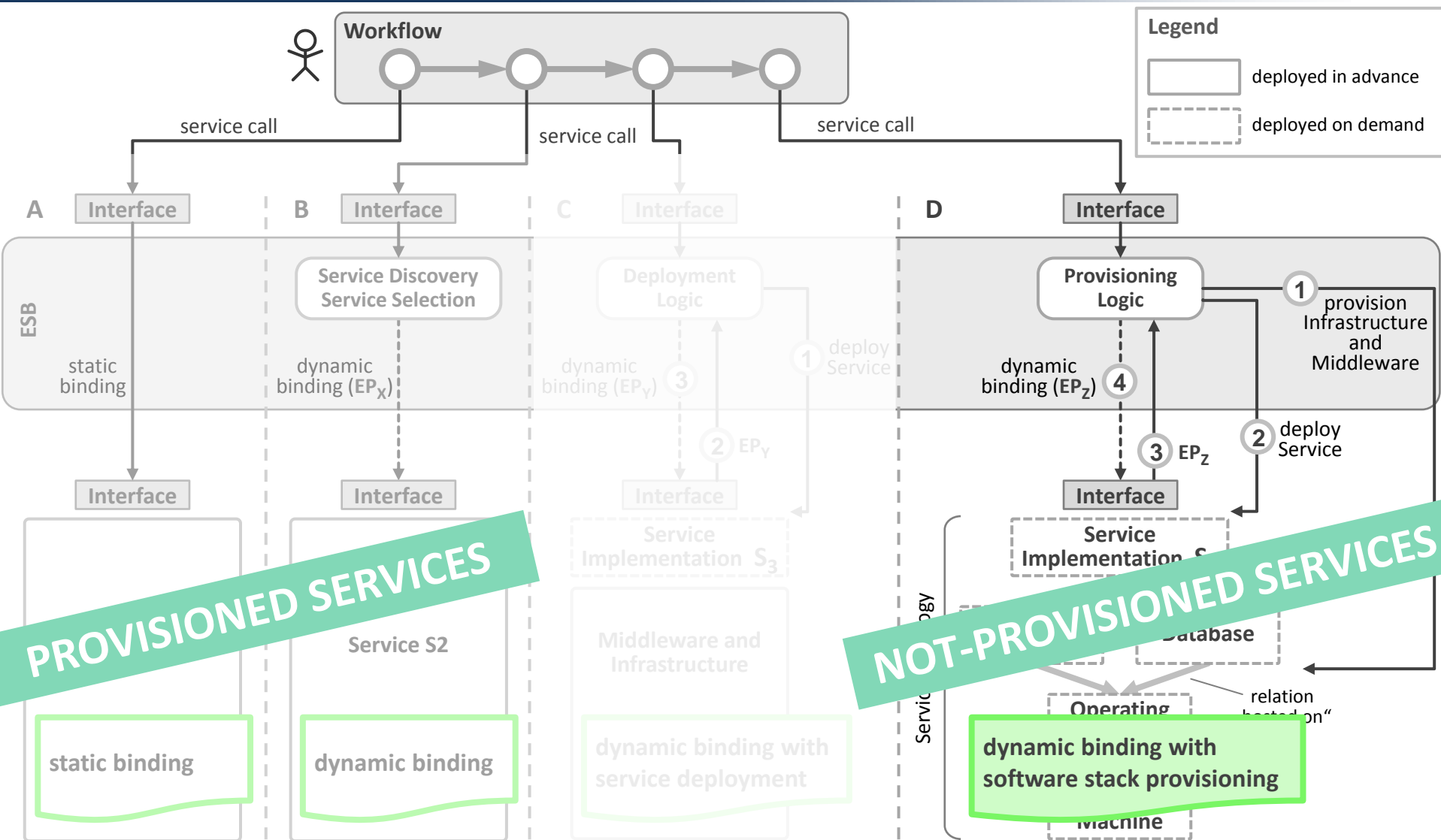


Classification of Service Binding Strategies



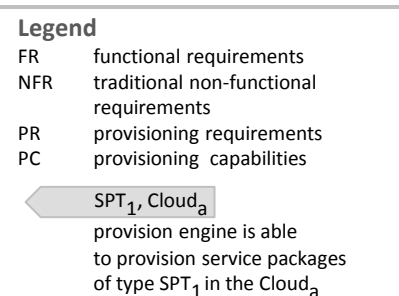
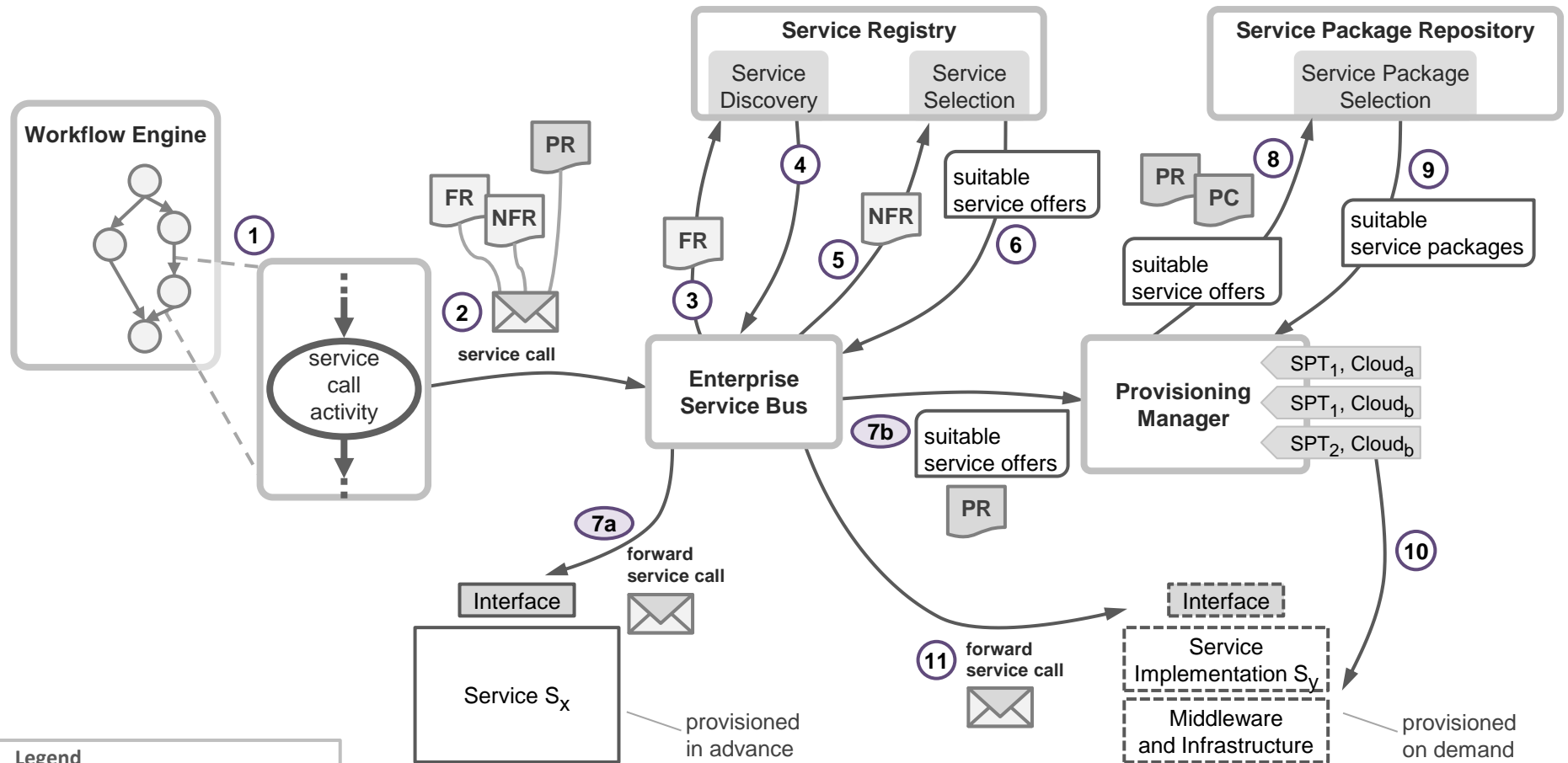
Vukojevic-Haupt, K.; Karastoyanova, D.; Leymann, F.: On-demand Provisioning of Infrastructure, Middleware and Services for Simulation Workflows. In: Proceedings of SOCA 2013

Classification of Service Binding Strategies



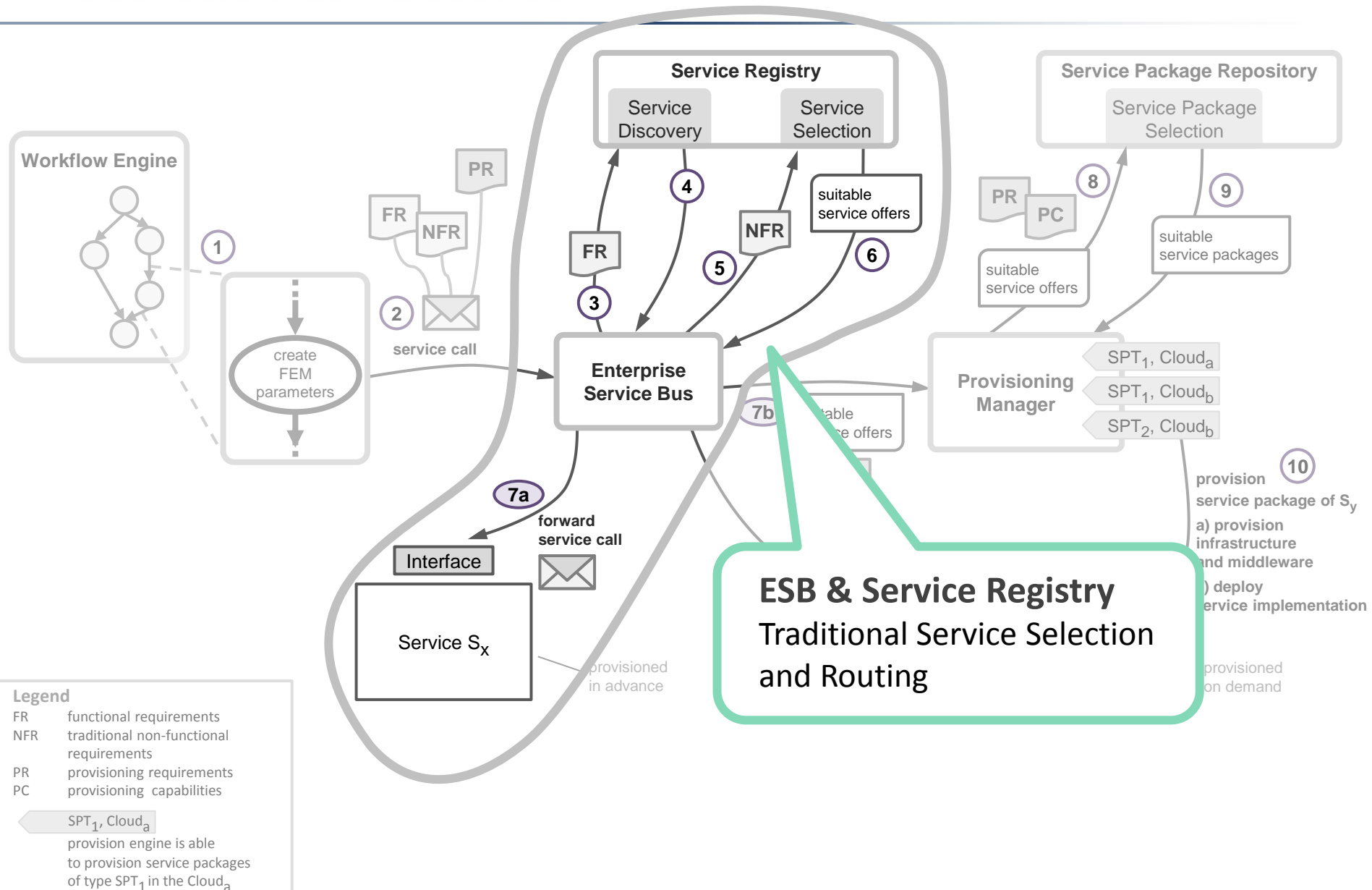
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Service Selection and Service Package Selection Process



Vukojevic-Haupt, K., Haupt, F., Karastoyanova, D., Leymann, F., (2014). Service Selection for On-demand Provisioned Services. In: Proceedings of the 18th IEEE International EDOC Conference (EDOC 2014)

Separation of Concerns



Separation of Concerns

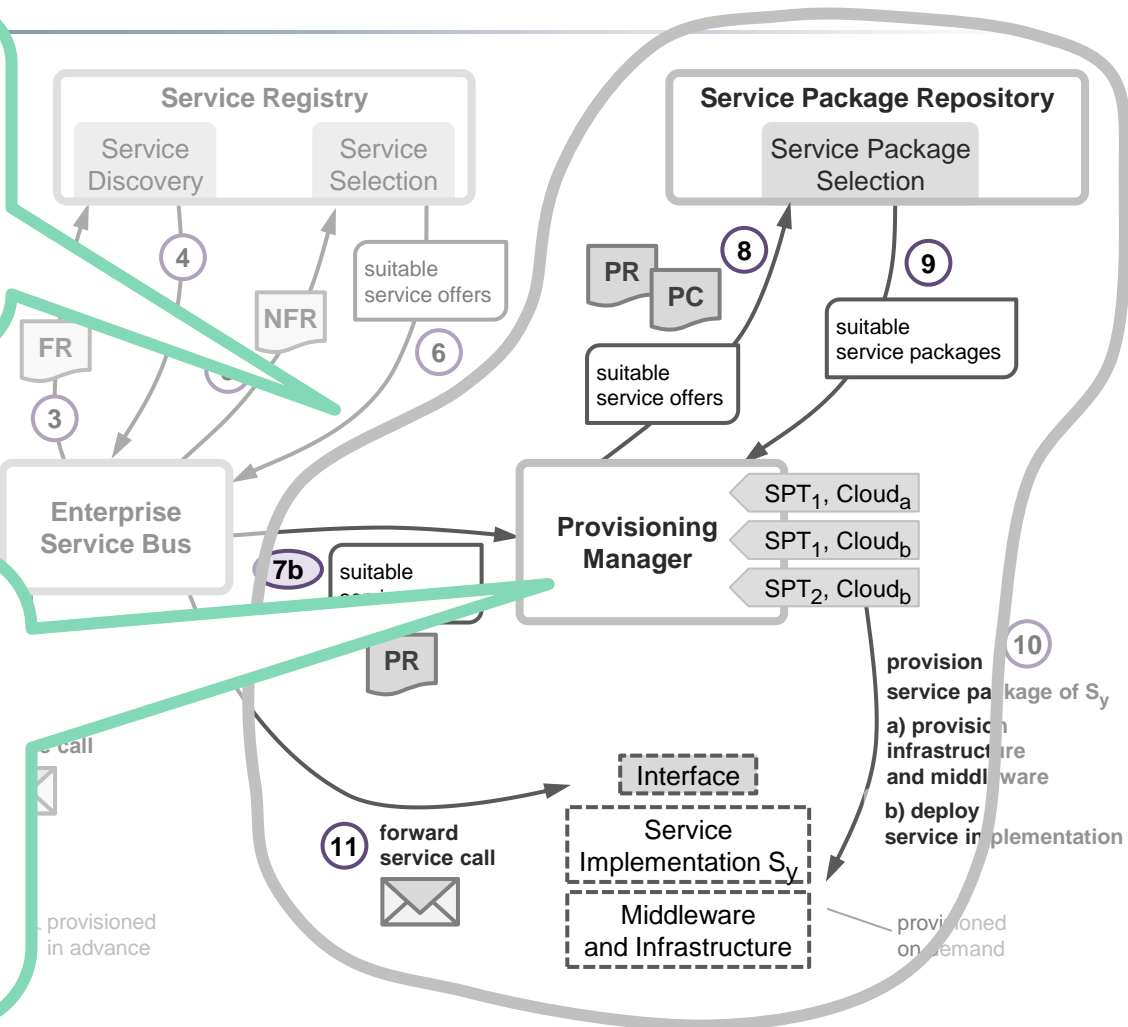
Provisioning Manager & Service Package Repository

Provisioning related functionality

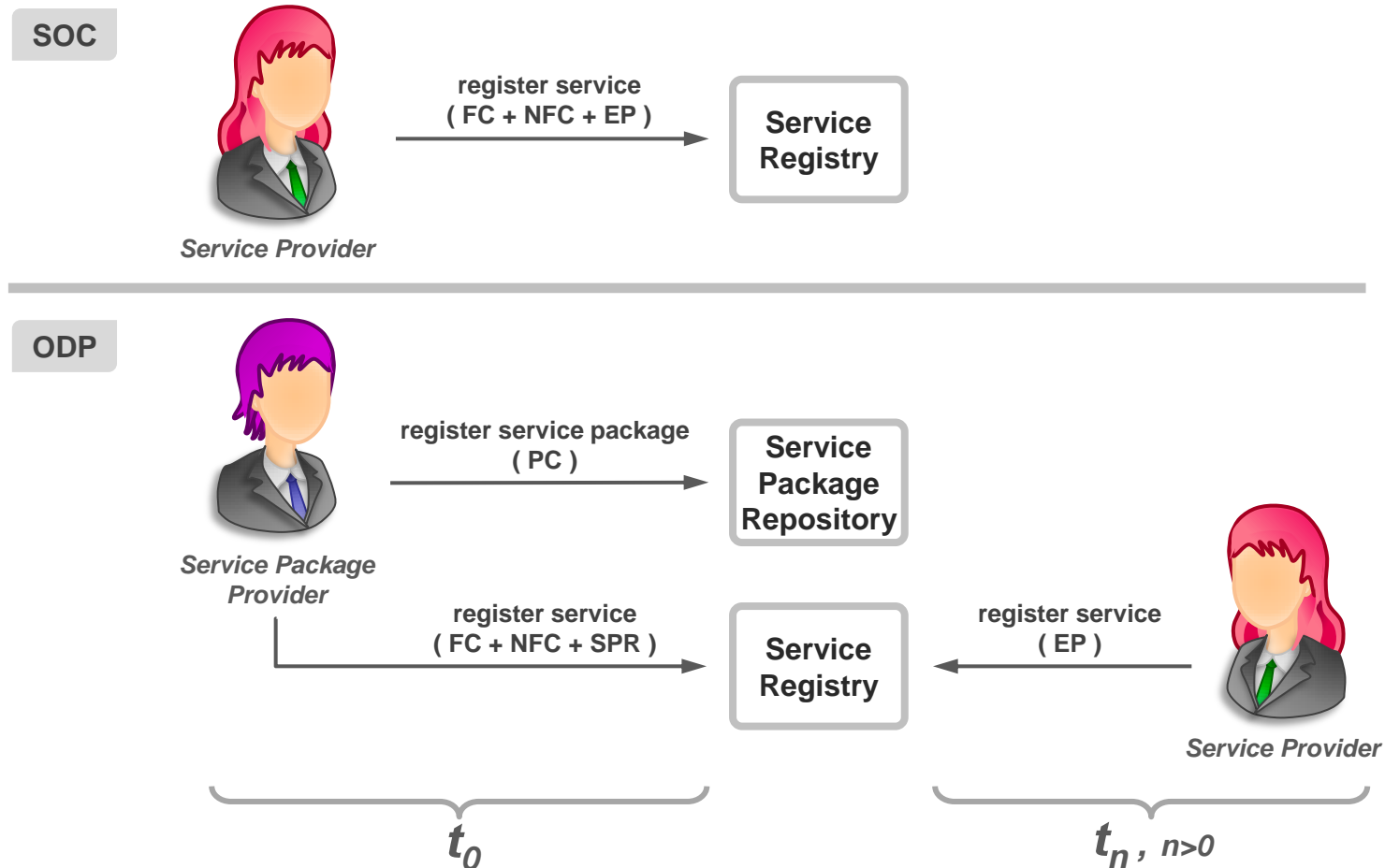
- Service Package Selection
- Provisioning of services

Designed to be extensible

- Support multiple Clouds
- Support multiple service package formats
- Enables reuse of existing service packages available in the web



Service Binding in SOC and ODP: Publishing a Service



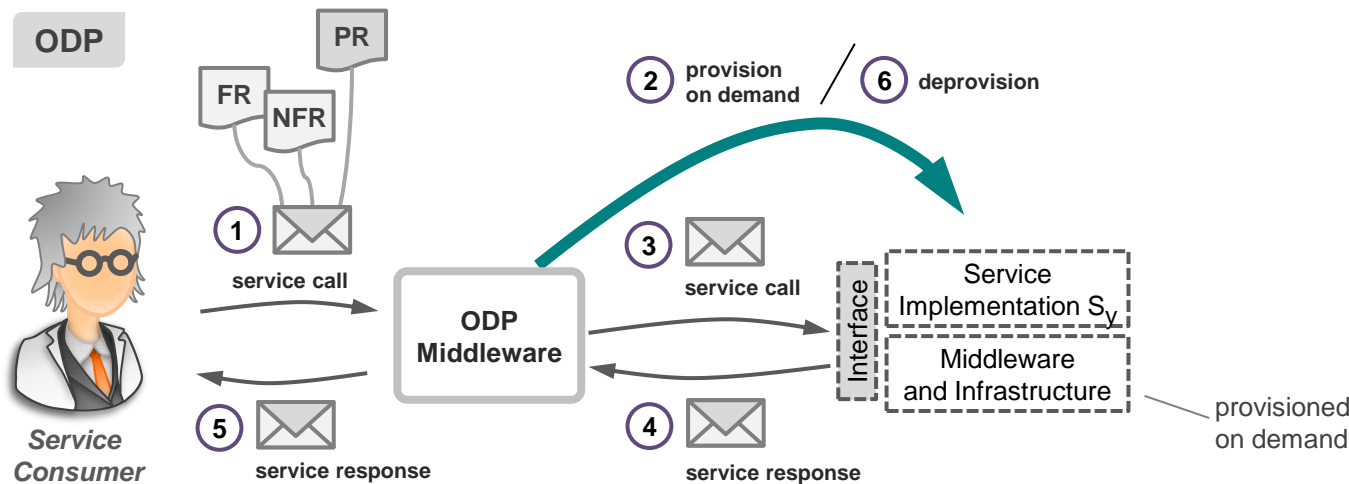
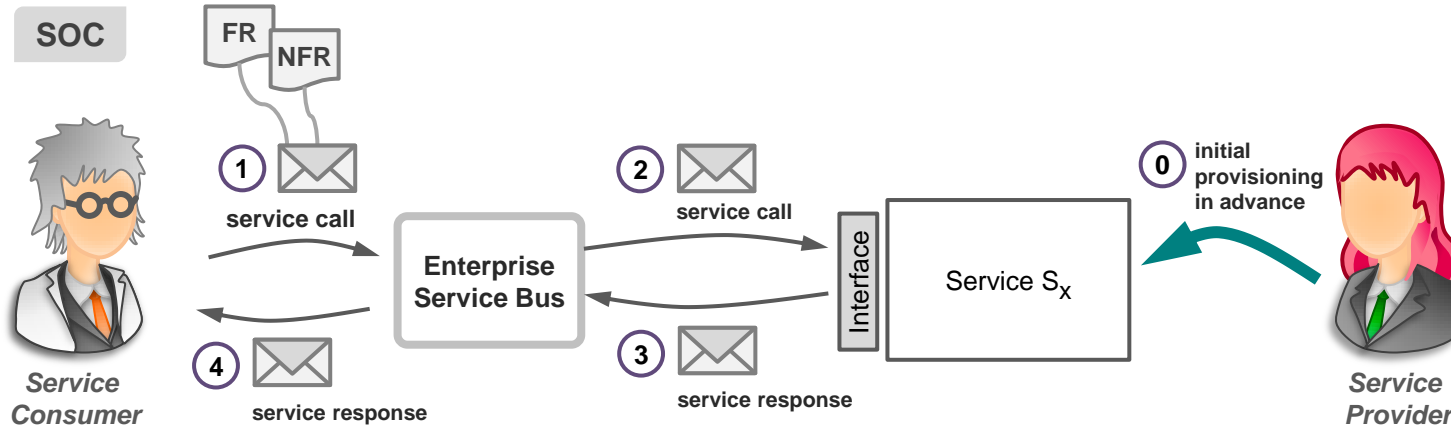
LEGEND

FC = functional capabilities
PC = provisioning capabilities

NFC = non-functional capabilities
SPR = service package reference

EP = endpoint

Service Binding in SOC and ODP: Calling a Service



LEGEND

FR = functional requirements

NFR = non-functional requirements

PR = provisioning requirements

Comparison of SOC and ODP: Publish – Find – Bind

	SOC	ODP
Publish	Functional capabilities Non-functional capabilities Endpoint	Functional capabilities Non-functional capabilities Service package reference
Find	Service selection	Service package selection
Bind	Bind to endpoint	Provision service Bind to endpoint

Summary

- Always on semantics of SOC is not suitable for services that are used rarely and irregularly
- Our approach: On-Demand Provisioning (ODP)
 - Users can run their workflows in the cloud with only one click
 - Complexity is hidden in the middleware (extended ESB)
 - Exploits cloud characteristics & uses existing provisioning technologies
 - Introduces additional challenges
- More ODP-related topics are discussed in the paper
 - And there is also a poster!

Contact

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Thank you 😊

