About The Need To Have <Policy/>

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Where we are coming from

Introduction to WS-Policy

Examples

Outlook

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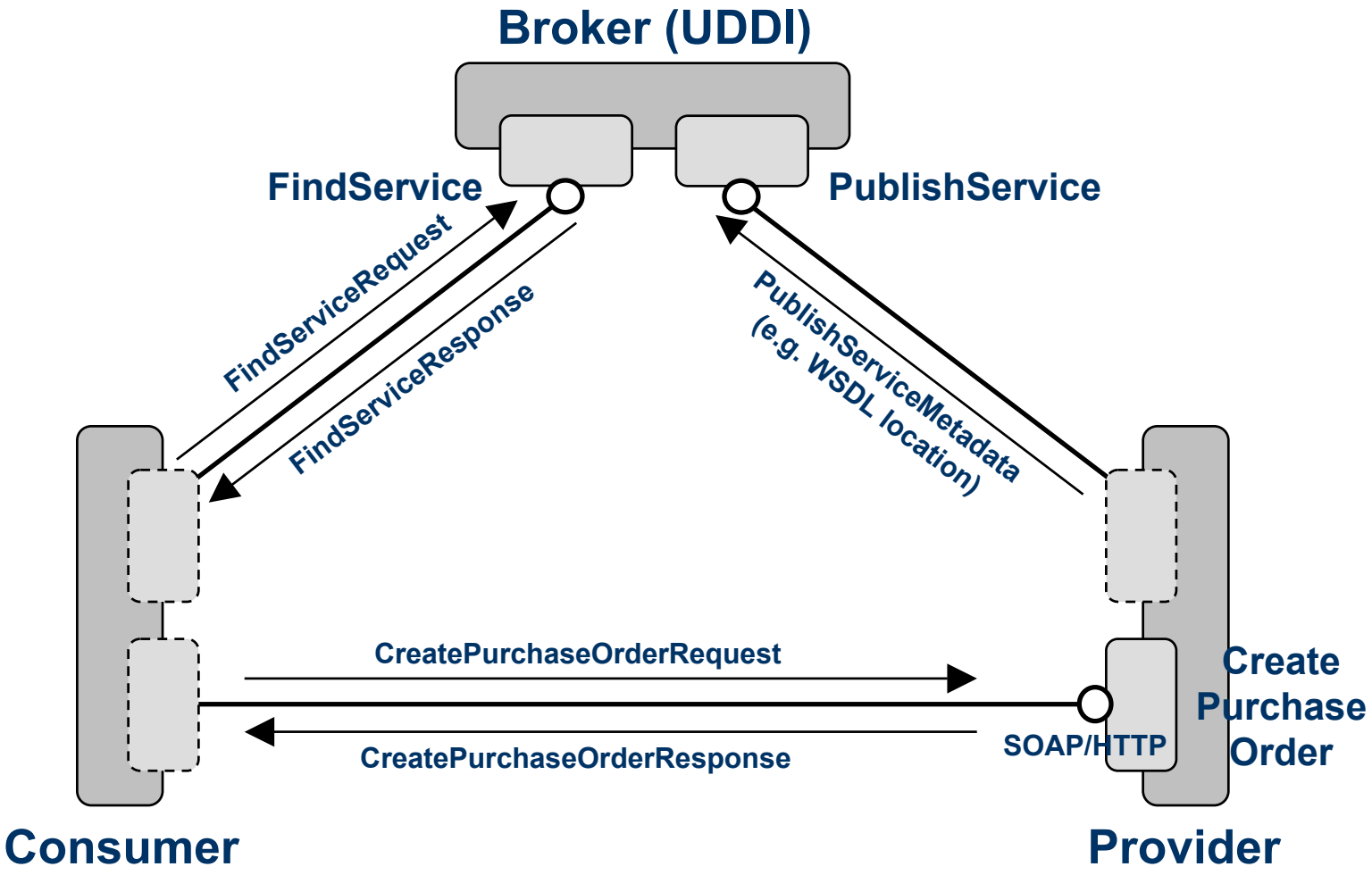
Web Services Model



Additional Requirements

Message Integrity

Authentication

Message Confidentiality

Authorization

Reliable Messaging

Stateful Services

Distributed Transactions

Business Context

How can corresponding Web service features/requirements/capabilities be described?

- Supported security token type (X.509, Kerberos, etc.)
- Reliable messaging retransmission interval
- Etc.

Requirements for a Web services policy language

Expressiveness

- Describe any Web service feature
- Carry parameters

Robustness

- Don‘t change whenever new Web service features are developed

Composeability

- Attach descriptions to WSDL elements and UDDI entities

Non-Goals

- Domain-specific policy attributes
- Policy exchange model

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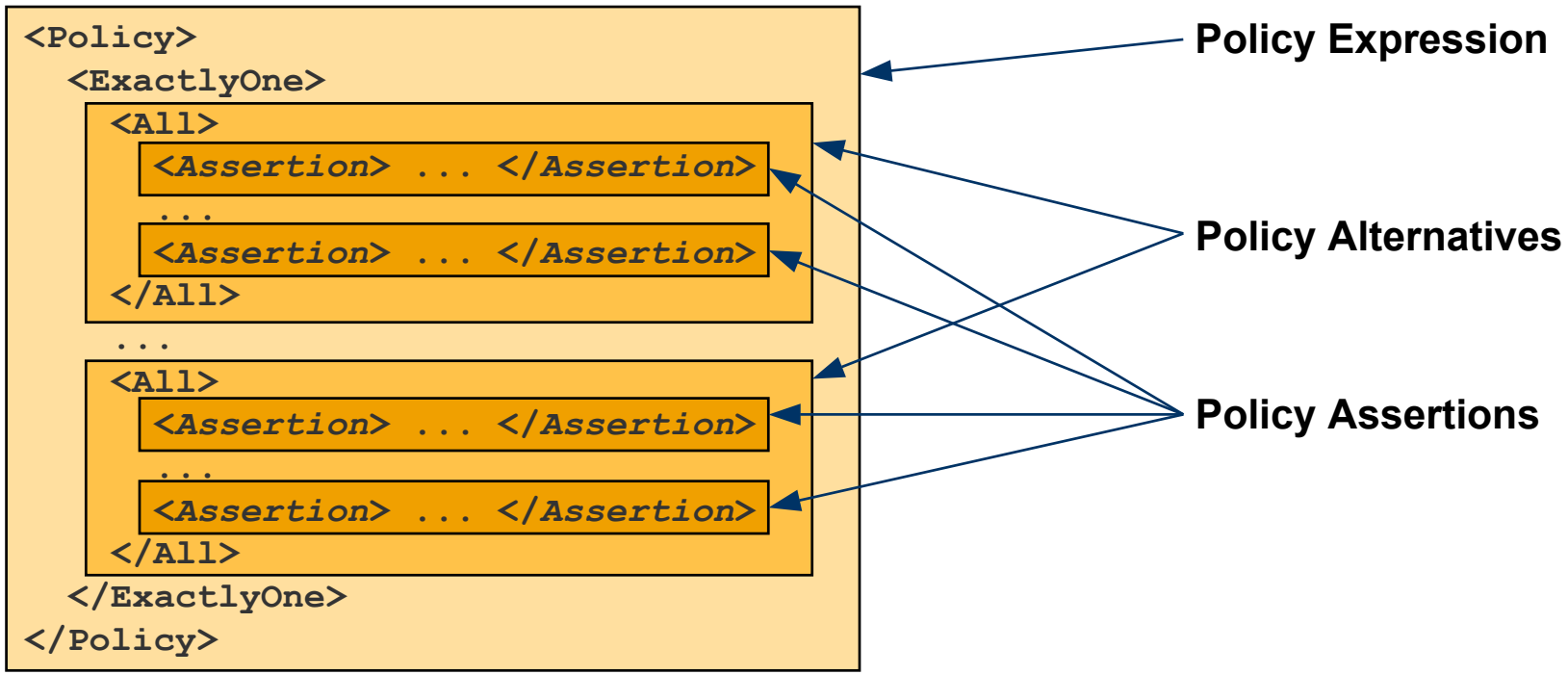
Web Services Policy Framework (WS-Policy)

Core aspects of a policy language for Web services

- How to combine different features (A AND B)?
- How to express alternatives (A_1 OR A_2)?
- How to be extensible for new feature types?



„Policy Normal Form“

WS-Policy Features

Reuse of policy definitions

- URI-based policy identification mechanism
- `<PolicyReference>` element to include externally defined policies

Policy compact form

- Nested `<ExactlyOne>`, `<All>`, and `<OneOrMore>` operators,
- Transformation to normal form using boolean logic (commutativity, associativity, idempotency, distributivity)

```
<All>
  <ExactlyOne>
    <Assertion1>
    <Assertion2>
  </ExactlyOne>
  <ExactlyOne>
    <Assertion3>
    <Assertion4>
  </ExactlyOne>
</All>
```

Is equivalent to ➔

```
<ExactlyOne>
  <All><Assertion1><Assertion3></All>
  <All><Assertion1><Assertion4></All>
  <All><Assertion2><Assertion3></All>
  <All><Assertion2><Assertion4></All>
</ExactlyOne>
```

Web Services Policy Attachment (WS-PolicyAttachment)

Association of policies with Web service subjects

Subject type

- Arbitrary XML elements
- WSDL elements
- UDDI entities

Association type

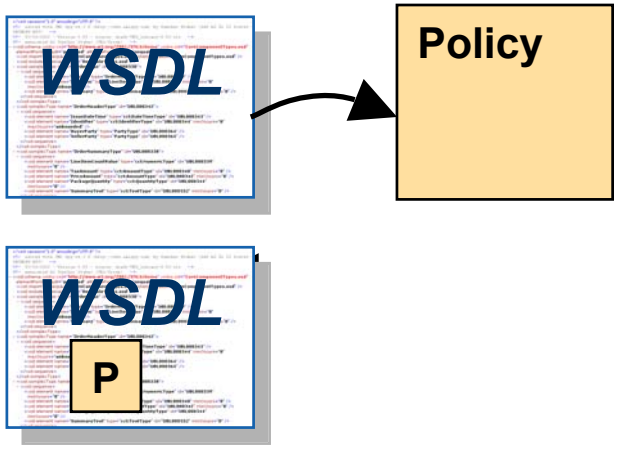
- Internal association (see next slide)
- External association, using domain expressions (identified by URI or QName)

```
<PolicyAttachment>
  <AppliesTo>
    <DomainExpression/> +
  </AppliesTo>
  ( <Policy/> | <PolicyReference/> ) +
</PolicyAttachment>
```

Attaching Policy to WSDL and UDDI

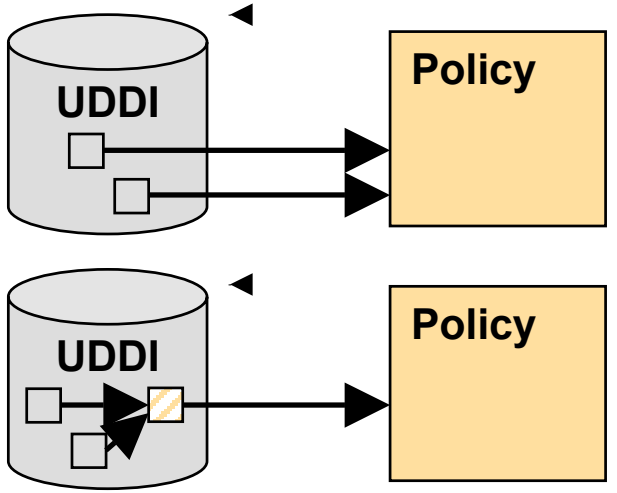
WSDL

- Policy references are made via global attributes or `PolicyReference` element as defined in WS-Policy
- Policy references can be made to policy expressions defined inline, e.g. in `wsdl:definitions` section

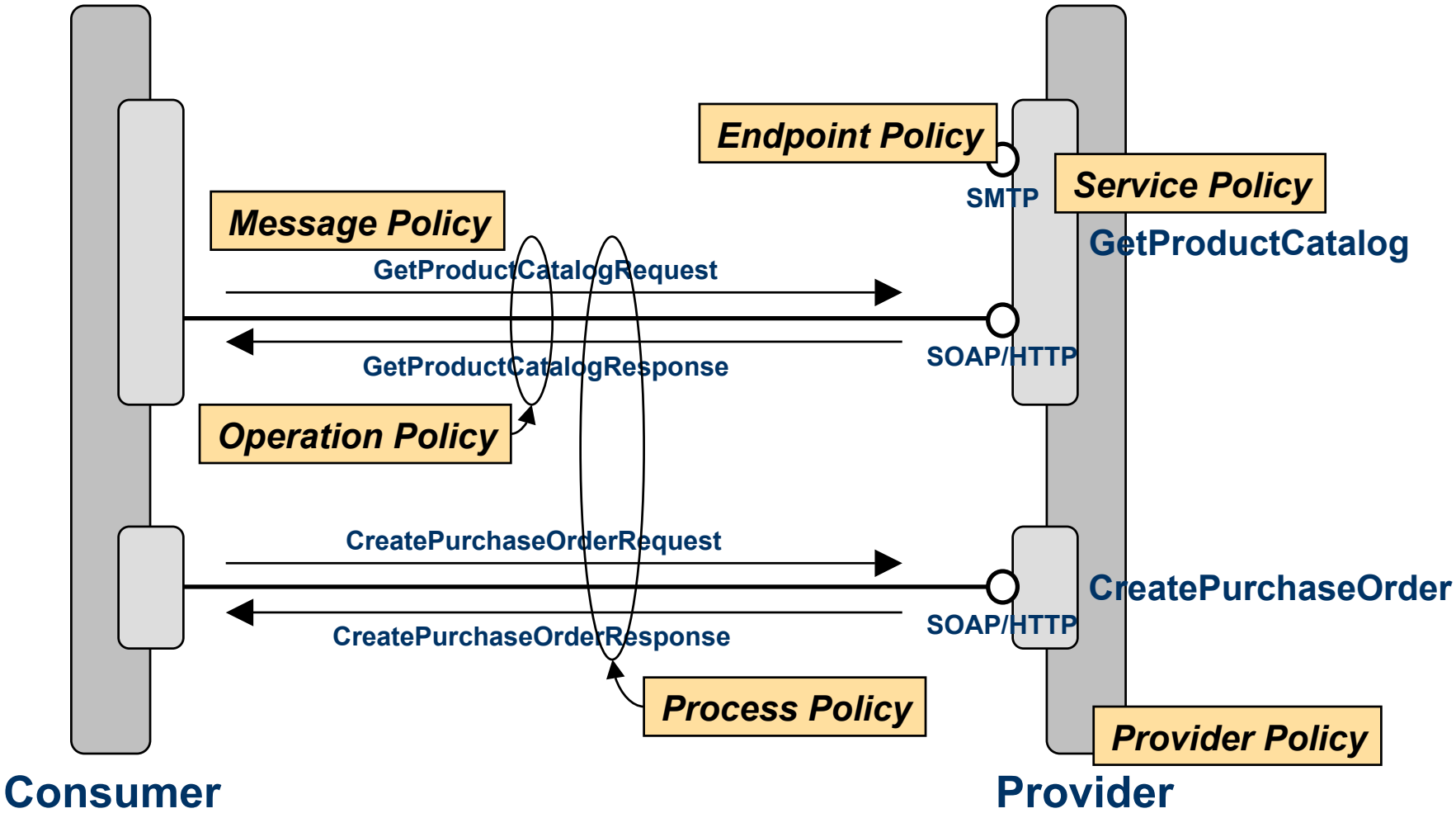


UDDI

- Policy references are made via UDDI categorization mechanism
- Policy expressions are always remote to UDDI entities
- Reusable policy expressions can be registered as distinct tModels
- Policy-based discovery is limited to policy expression URIs



Policy Types



Policy Assertions

Policy assertions are domain-specific

- Separate XML schema (syntax) and specification (semantics)
- Arbitrary nested structure of XML elements and attributes
- Separate namespace

Assertion complexity

- Simple assertions `<Auditing>`
- Parameterized assertions `<BaseRetransmissionInterval MilliSeconds="3000">`

Consequence for policy processors

- Support WS-Policy syntax directly
- Delegate policy assertion processing to assertion-specific handlers
  - How to compare assertions?
  - How to merge assertions?
  - How to validate the support of an assertion?

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Web Service Policy Assertions

Message-level Security

- Security token types
- Message Confidentiality
- Message Integrity

Reliable Messaging

- Delivery assurances
- Timeouts

Transactions

- Statefulness
- Coordinator handling

Service Broker

- Notification Method and Frequency

A Business Scenario

CPG manufacturers and retailers agree to implement a VMI scenario

VMI (Vendor Managed Inventory) means that

- The manufacturer is responsible for the retailer‘s stock replenishment
- The retailer has to send sales figures and stock levels regularly to the manufacturer

The manufacturer can only guarantee appropriate replenishment, if the retailer sends sales figures and stock levels at a certain frequency

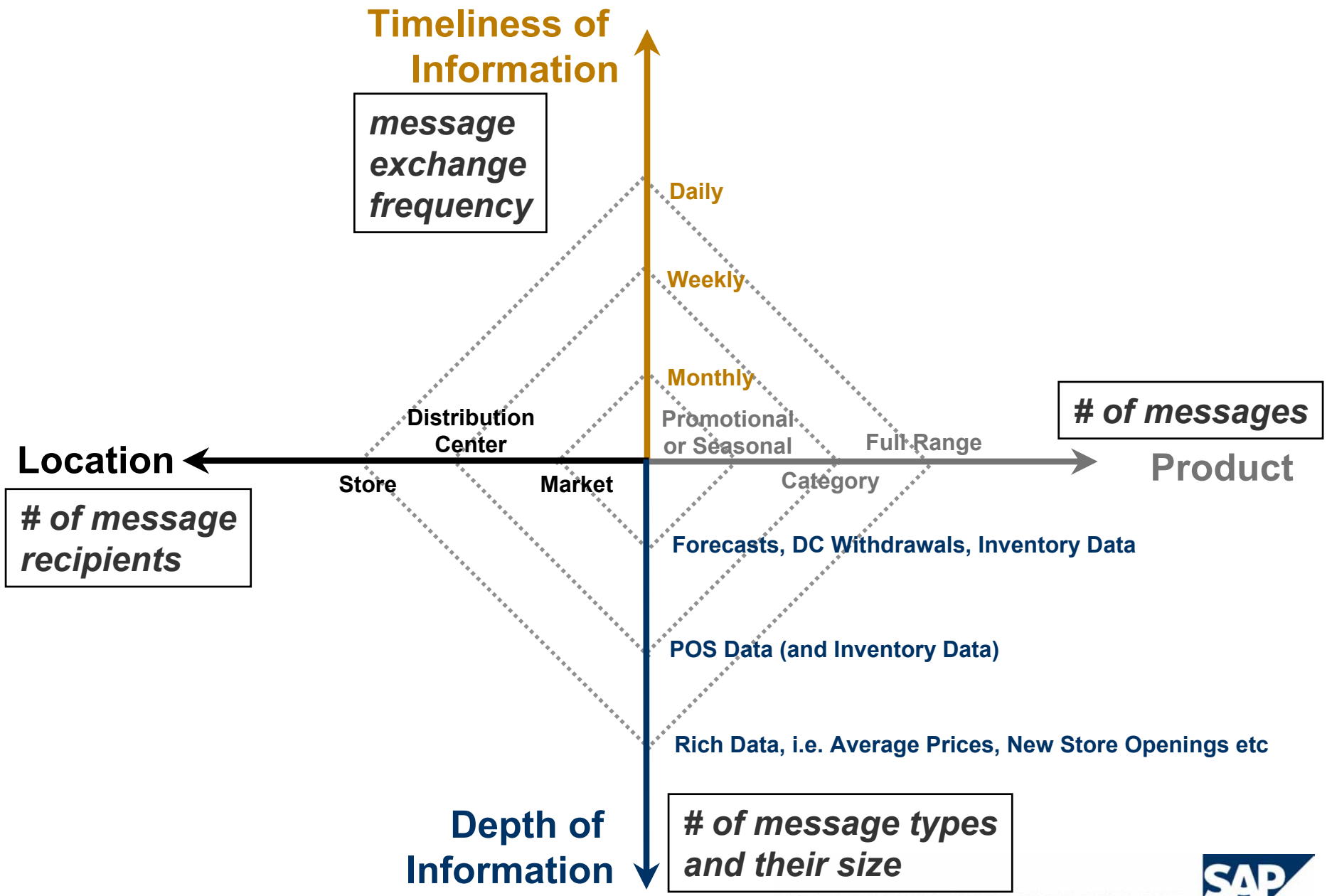
The frequency depends on the merchandise category a given product belongs to:

```
<vmi:UpdateFrequencies wsp:Usage="wsp:Required"
  vmi:CategoryType="GCI">
  <vmi:UpdateFrequency
    vmi:MerchandiseCategory="10000031"
    vmi:Frequency="1">
  <vmi:UpdateFrequency
    vmi:MerchandiseCategory="10000043"
    vmi:Frequency="3">
</vmi:UpdateFrequencies>
```

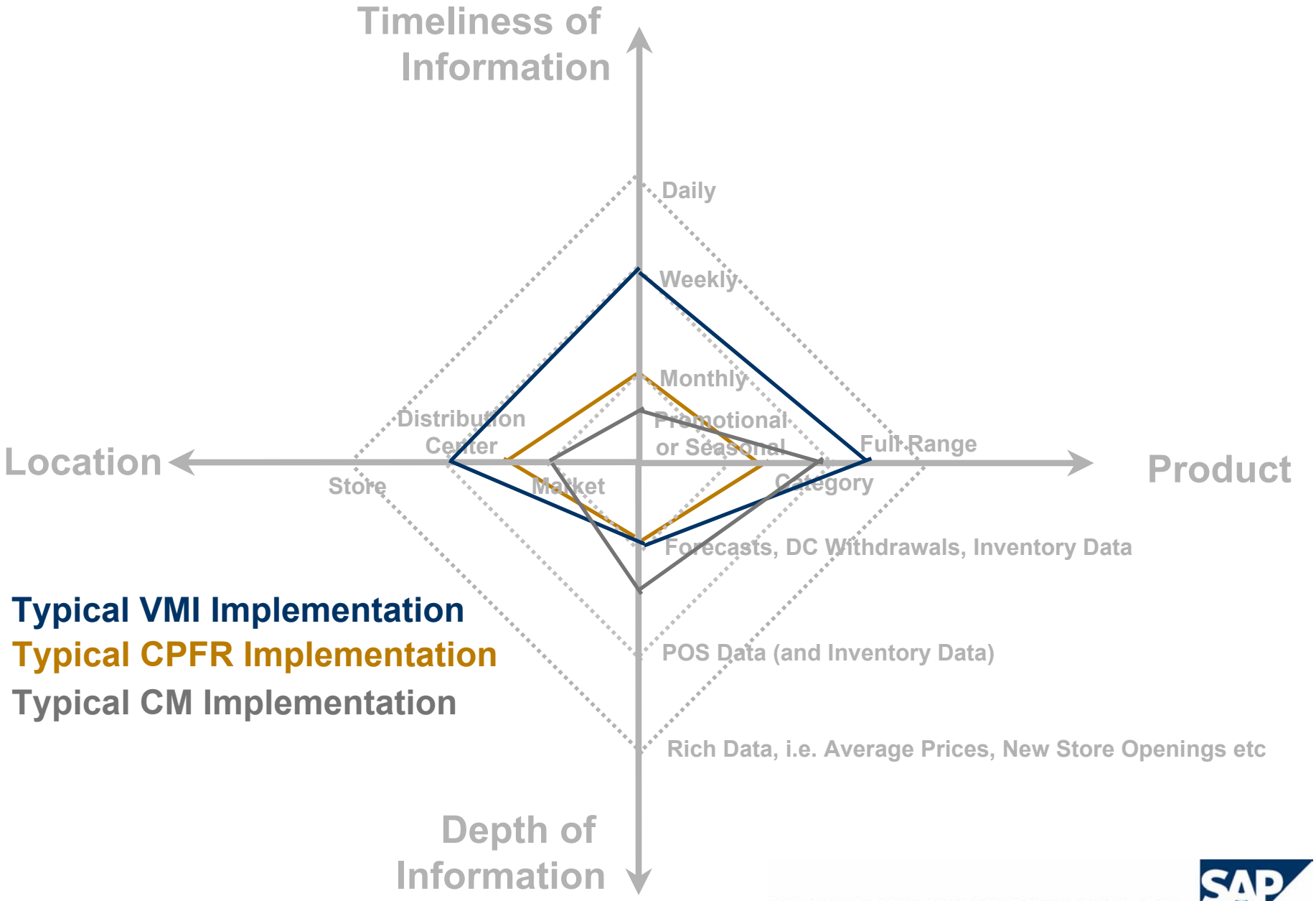
Eggs: daily

Sugar: weekly

Extended Collaborative Business Scenarios



Collaborative Business Scenario Types



Collaborative Business Policy

One policy assertion

```
<c:Collaboration
  ProductRange="…"
  InformationDepth="…"
  LocationType="…"
  ExchangeFrequency="…"/>
```

Scenario-specific profiles

```
<c:Collaboration
  ProductRange="Product"
  InformationDepth="InventoryData"
  LocationType="DC"
  ExchangeFrequency="Weekly"/>
```

Vendor Managed Inventory (VMI) Policy Profile

```
<c:Collaboration
  ProductRange="Category"
  InformationDepth="POSData"
  LocationType="Market"
  ExchangeFrequency="Seasonal"/>
```

Category Management (CM) Policy Profile

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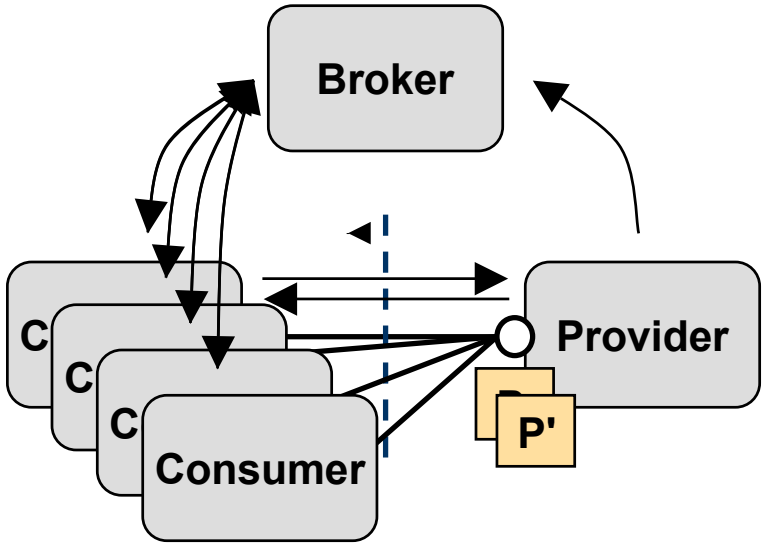
Policy Exchange

Peer-to-peer

- Consumer retrieves policy from provider (e.g. WS-MetadataExchange)

Brokered approach

- Provider publishes policy to broker (e.g. UDDI)
- Consumers subscribe to Web services used
- Broker notifies consumers in case changes occur



Additional Issues

Abstract/Concrete Policies

- Abstract: „I provide confidentiality“
- Concrete: „I support HTTP/S“ or „I support WS-Security“

Policy Versioning/Composition

Standardization

Where we are coming from

- BEA, IBM, Microsoft, and SAP have developed WS-Policy

Specification	2002		2003				2004	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
WS-Policy	V 1.0 Published		V 1.1 Published			V Next Published		..

Next steps

- Open workshop on Web service policy
- WS-Policy submission to standards organization

What is also needed

- Best practices for WSDL and UDDI attachment approaches
- Guidelines for assertion authors
- Domain-specific assertion definitions

Additional Information

Specifications

- WS-Policy http://ifr.sap.com/ws-policy
- WSDL 1.1 http://www.w3.org/TR/2001/NOTE-wsdl-20010315
- UDDI 2.0 http://www.oasis-open.org/committees/uddi-spec/tcspecs.shtml#uddiv2
- UDDI 3.0 http://www.oasis-open.org/committees/uddi-spec/doc/tcspecs.htm#uddiv3
- WS-MetadataExchange http://ifr.sap.com/ws-metadataexchange

Q&A

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