

Semantic Web Services Hands-On Session with IRS-III and WSMO Studio

Barry Norton and John Domingue

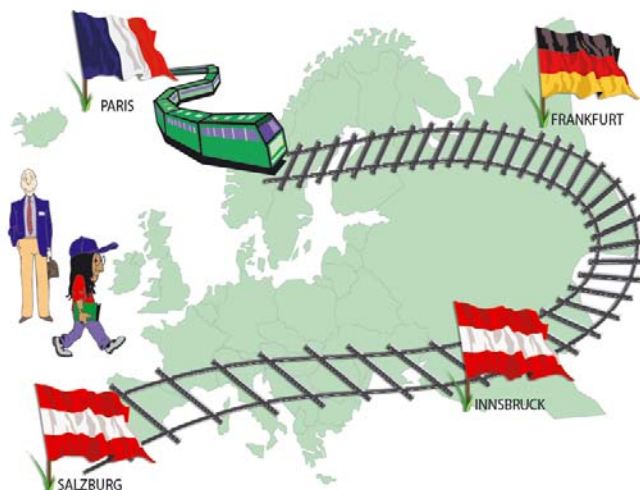
Knowledge Media Institute,
The Open University, UK



The Sixth Summer School on Ontological Engineering and the Semantic Web (SSSW'08)



European Travel Scenario



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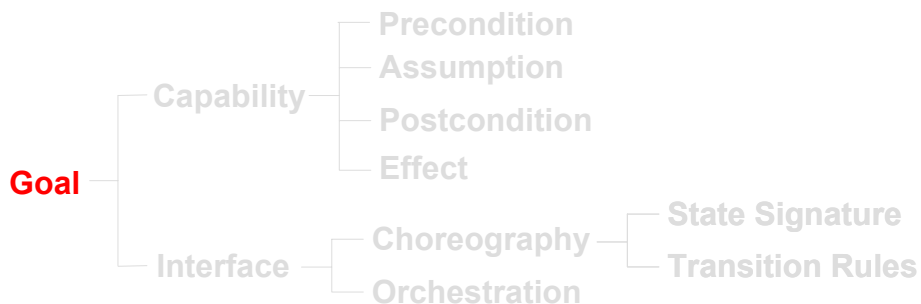
European Travel Demo



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Goal Description



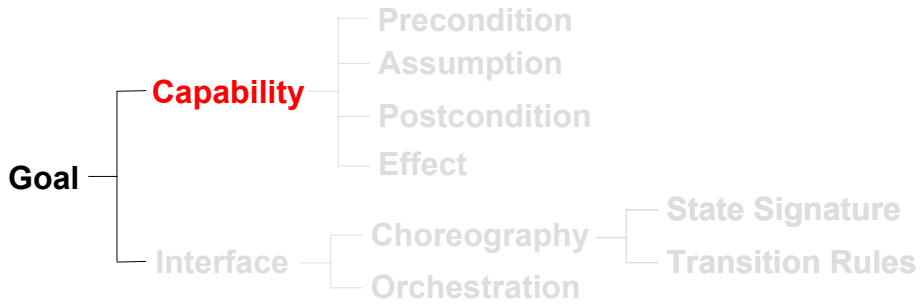
- Goals describe requirements from client perspective...



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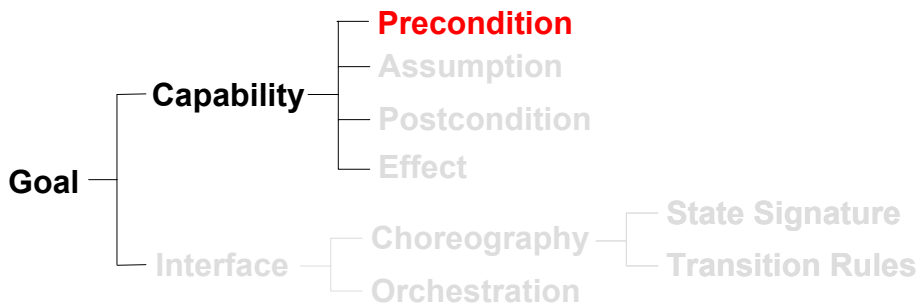
Goal Description



- Their Capabilities describe the functional requirements...



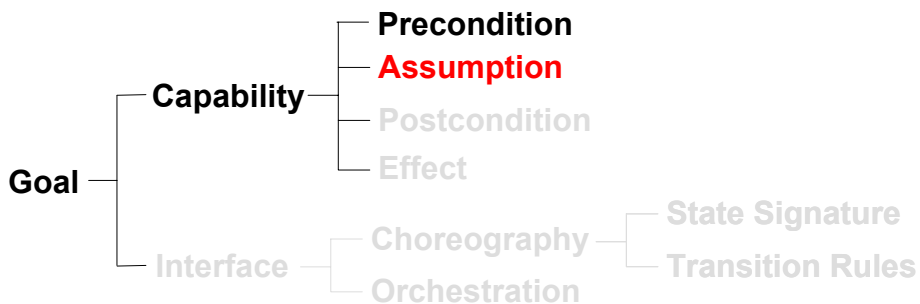
Goal Description



- Preconditions express guarantees client can make, purely over information they can communicate, in order that functional



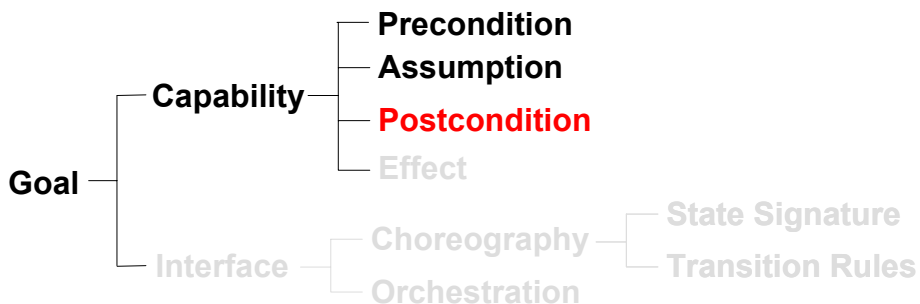
Goal Description



- Assumptions express general guarantees client can make, involving communications and environment, in order that functional



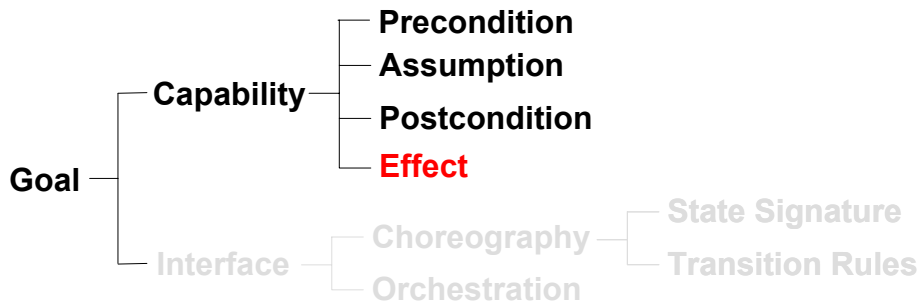
Goal Description



- Postconditions express guarantees client would like over information communicated back in order that functional requirements



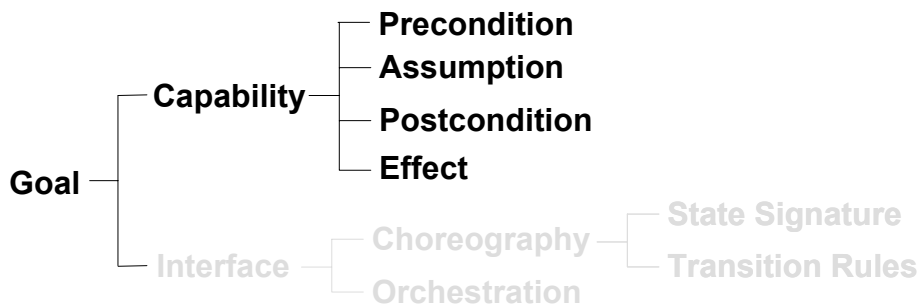
Goal Description



- Effects express the general guarantees the client would like after the goal has been achieved



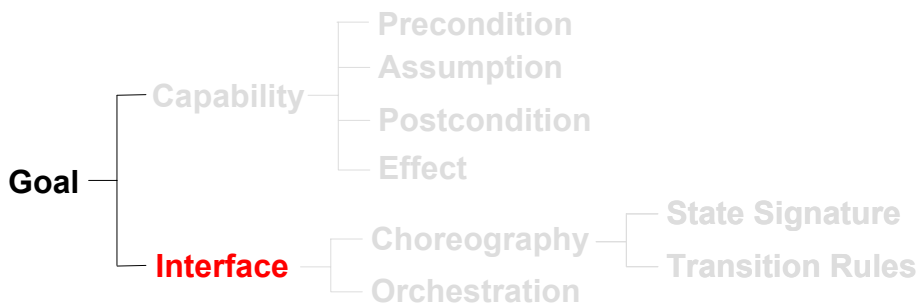
Goal Description



- Capabilities can be used for one or more of: representing a client-oriented perspective, advertising and service



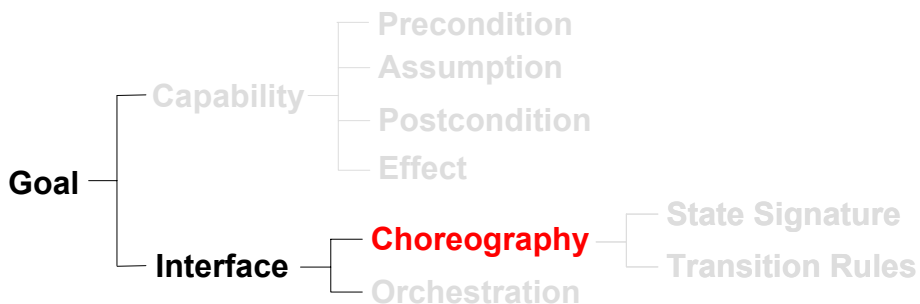
Goal Description



- The interfaces of goals describe the behavioural requirements of clients, *i.e.* constraints over communication



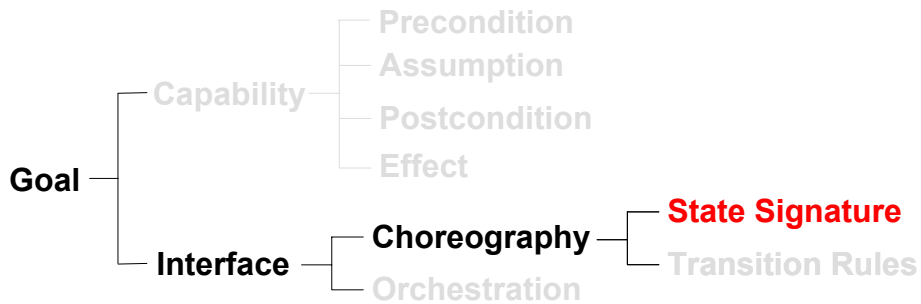
Goal Description



- The choreography expresses communications the client is able to engage in.



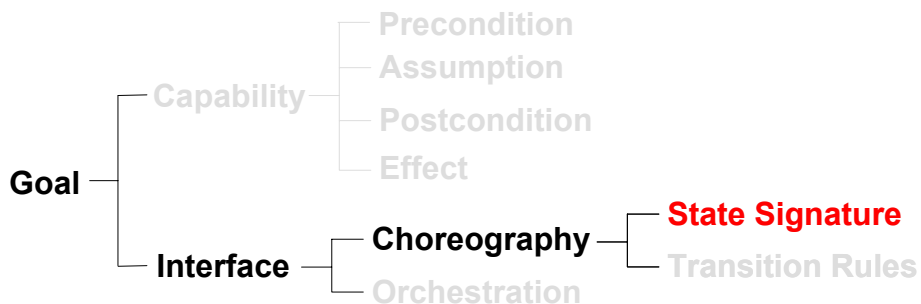
Goal Description



- The state signature describes these communications semantically, by linking modes to ontological concepts



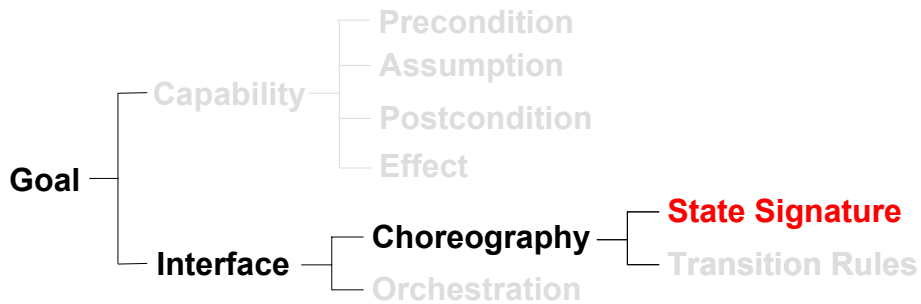
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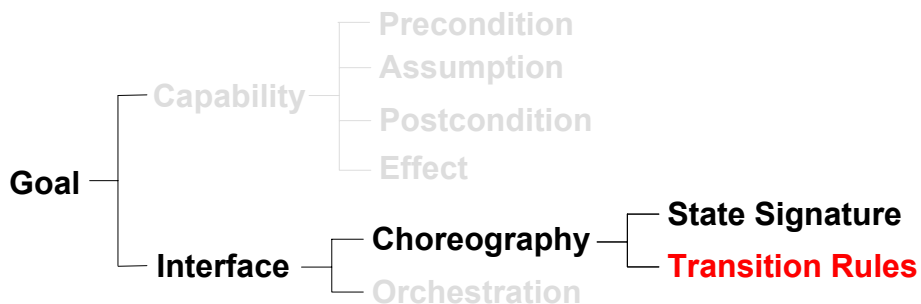
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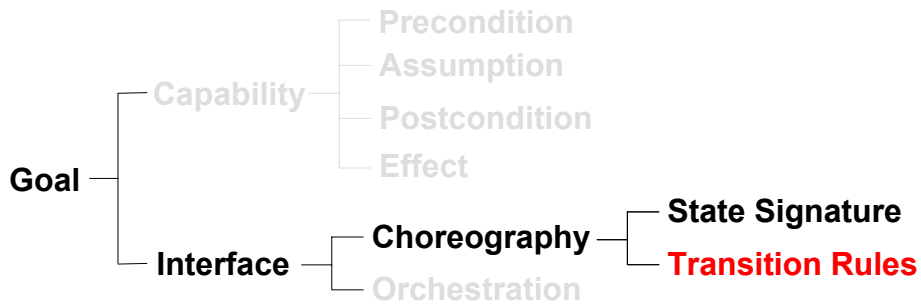
Goal Description



- Transition rules link communications into a stateful interaction



Goal Description



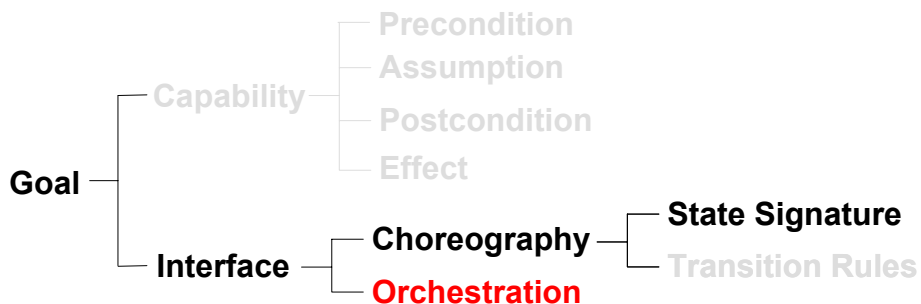
- Transition rules link communications into a stateful interaction:
 - Transition rules can be used to constrain the stateful behaviour of matching services, or define the process mediation a priori. We do



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Goal Description



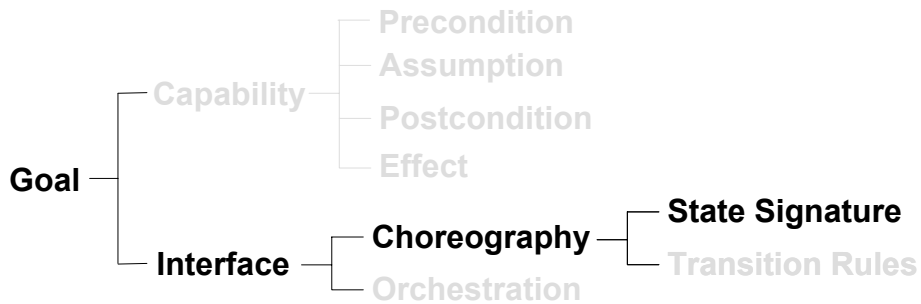
- Orchestrations govern over the composite behaviour that is required to go into meeting the goal – the technology to exploit this is not yet available



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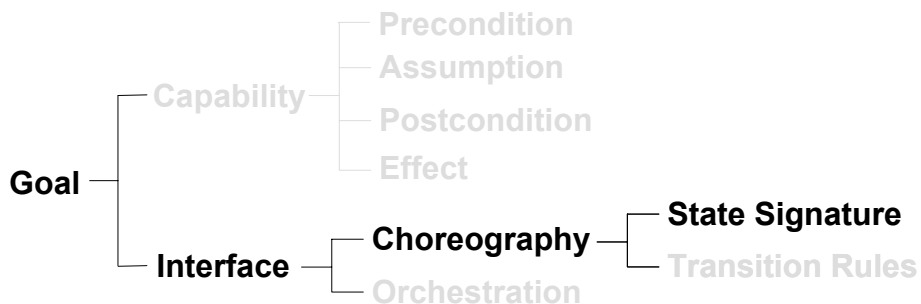
Goal Description in Tutorial



- The steps that go into describing a goal in the tutorial are:



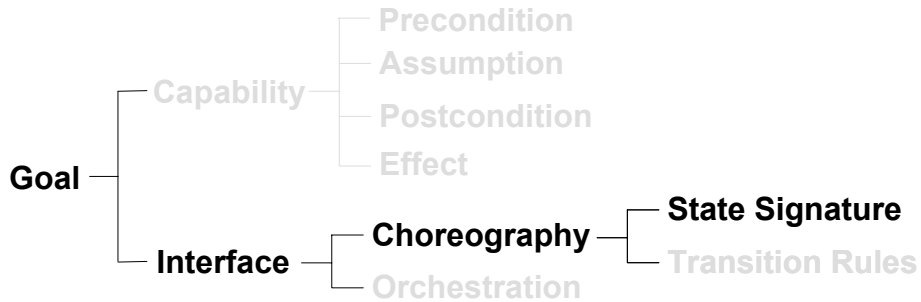
Goal Description in Tutorial



- The steps that go into describing a goal in the tutorial are:
 - Ontological description of the communications (request and response)



Goal Description in Tutorial



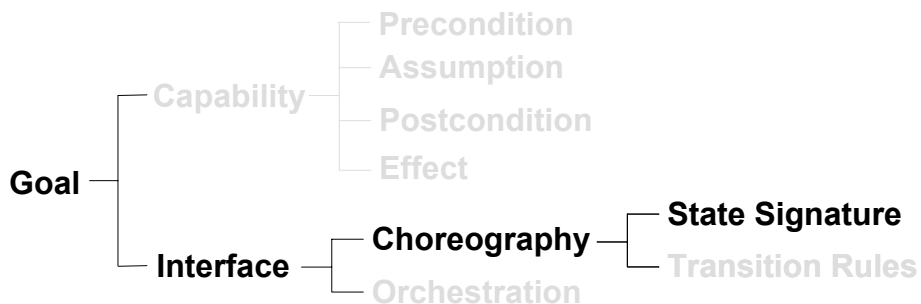
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Goal Description in Tutorial



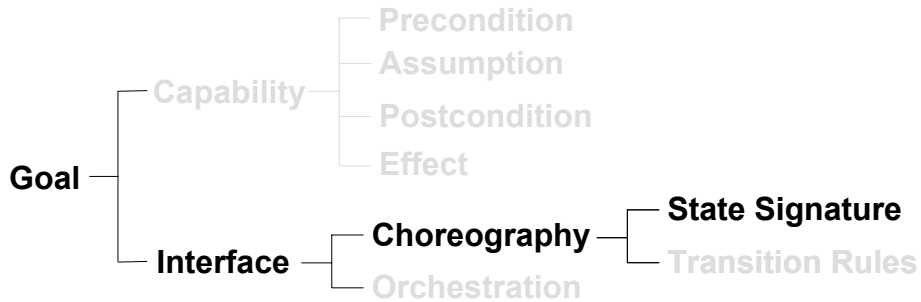
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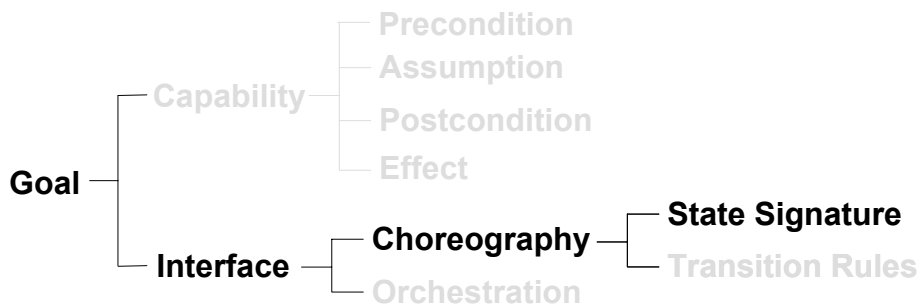
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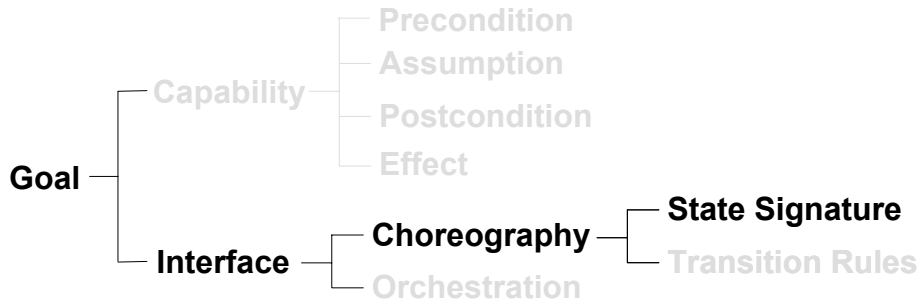
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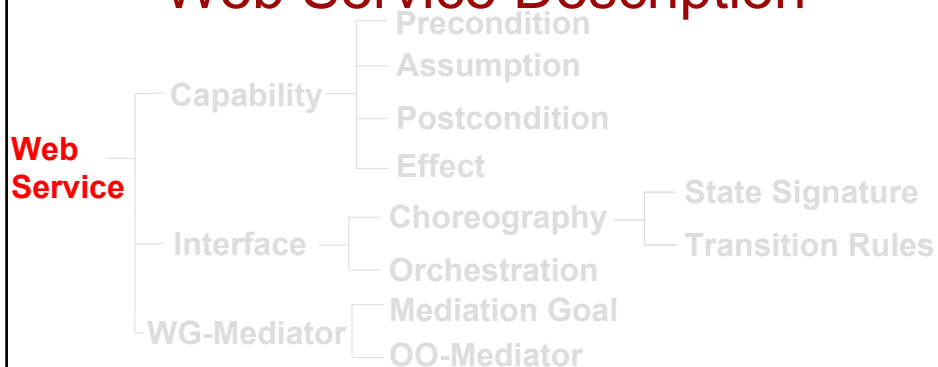
Goal Description in Tutorial



- The steps that go into describing a goal in the tutorial are:
 - Ontological description of the communications (request and response);
 - Creation of a goal;



Web Service Description



- WSMO Web Services describe abilities of deployed services...



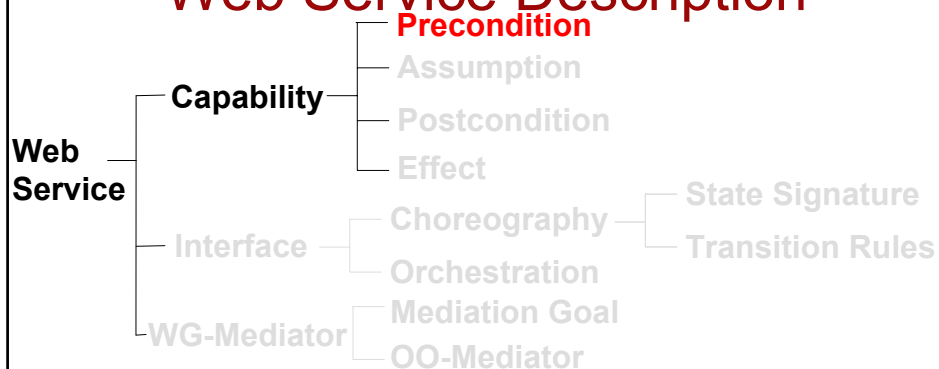
Web Service Description



- Their Capabilities describe their functional abilities...



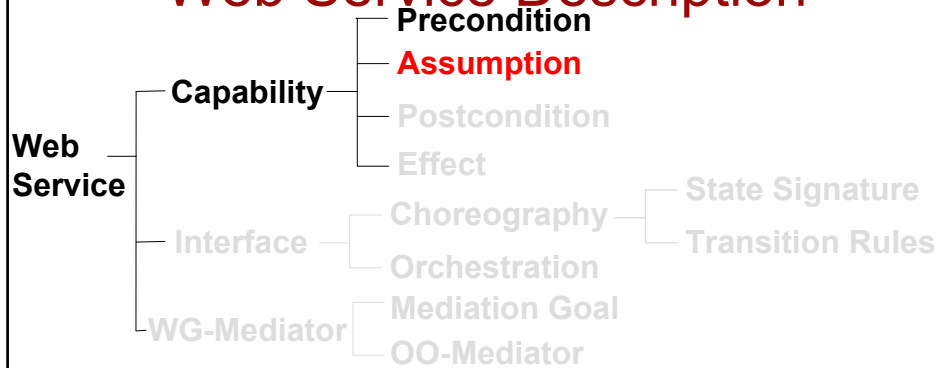
Web Service Description



- Preconditions express guarantees they expect from clients, purely over information they communicate.



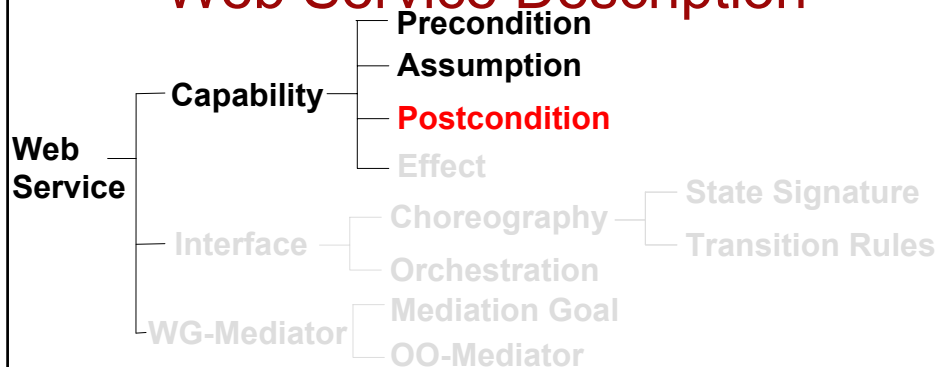
Web Service Description



- Assumptions express general guarantees they expect of clients, involving communications and environment



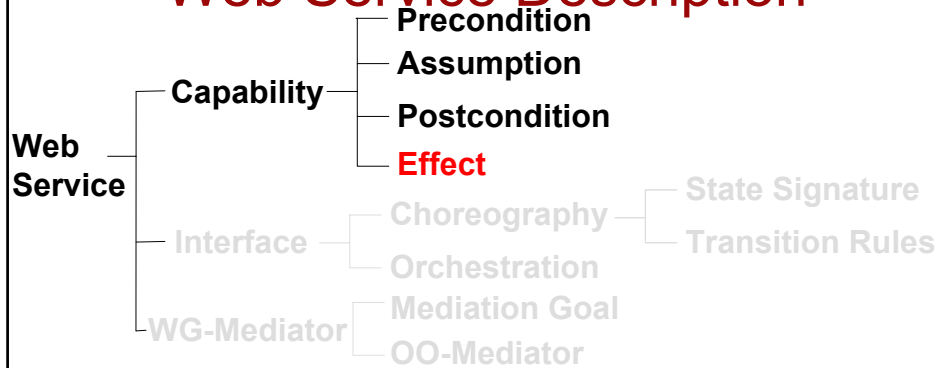
Web Service Description



- Postconditions express guarantees they make over information communicated back, providing the preconditions and



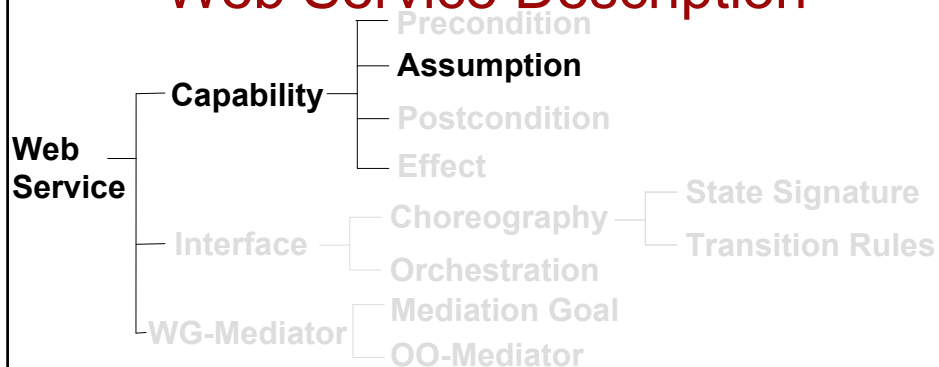
Web Service Description



- Effects express the general guarantees made, over communicated and changes to the environment, providing the



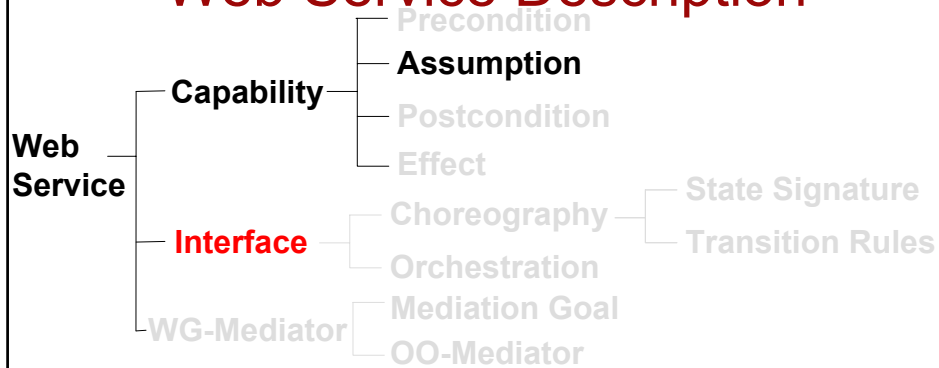
Web Service Description



- The last part of the hands on session uses the assumption for web service selection.



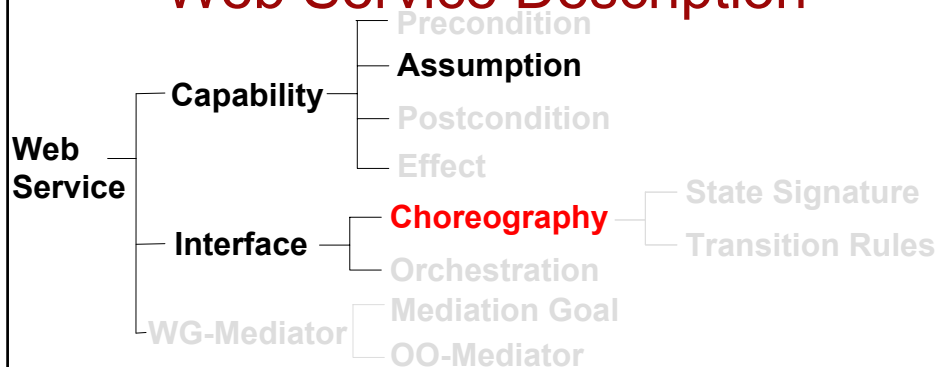
Web Service Description



- The interfaces of web services describe their behavioural characteristics, *i.e.* the communications they engage in



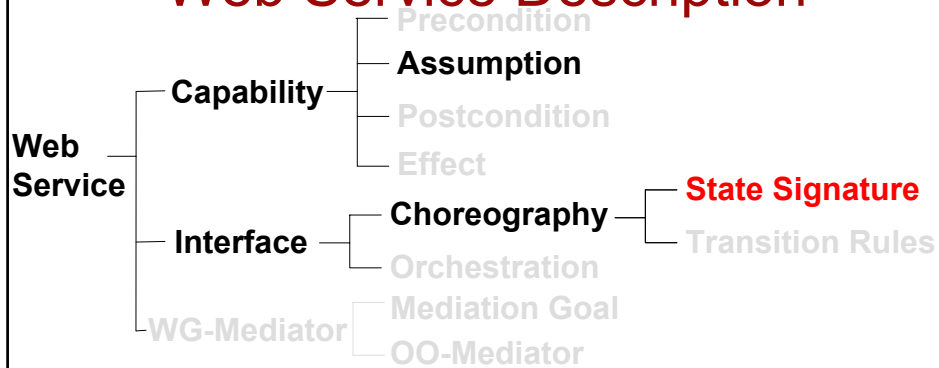
Web Service Description



- The choreography expresses communications the service engages in with its clients



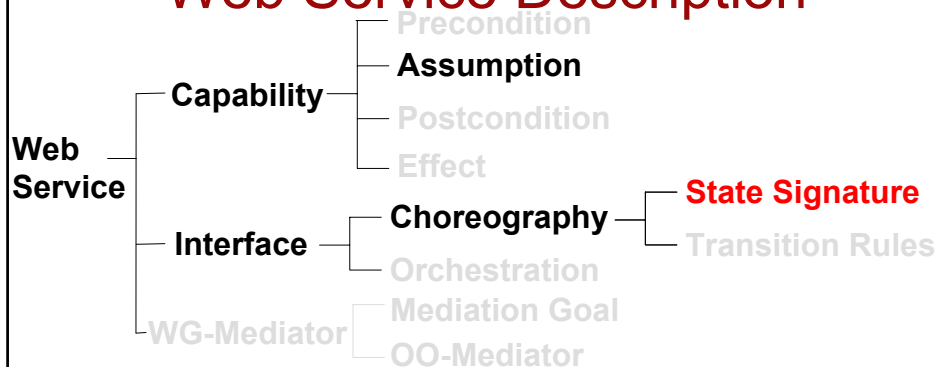
Web Service Description



- The state signature describes these communications semantically, by linking modes to ontological concepts



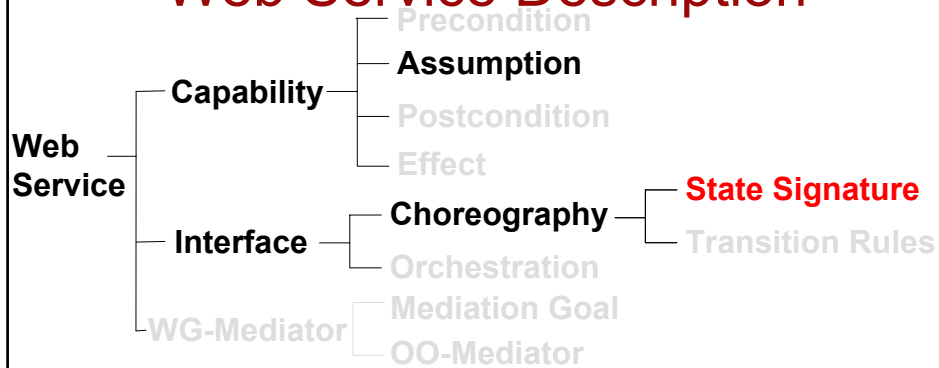
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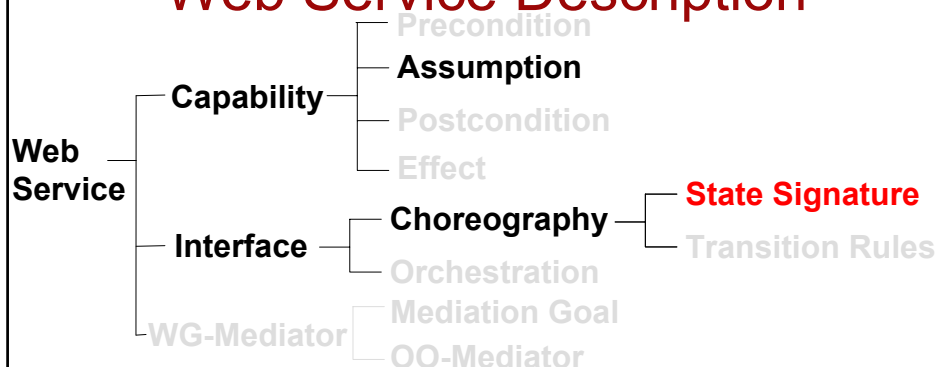
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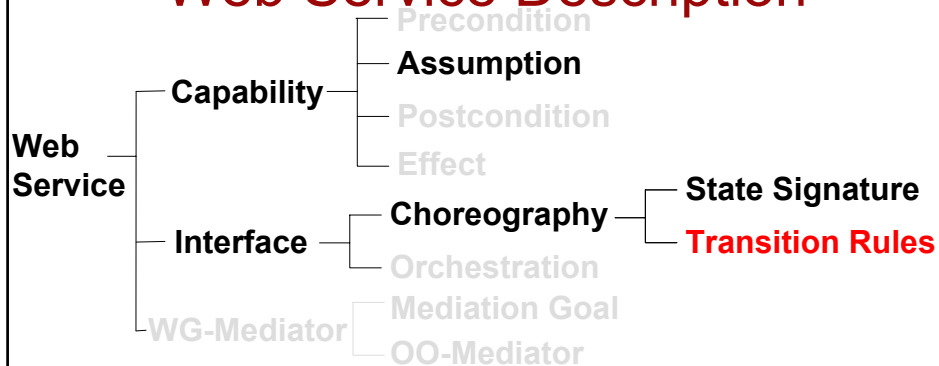


- The state signature describes these communications semantically, by linking modes to ontological concepts:

– IN modes describe communications the client would like to receive:



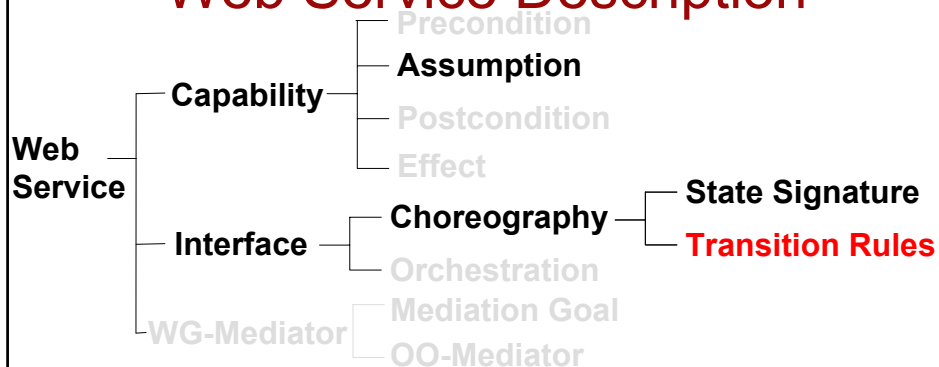
Web Service Description



- Transition rules link communications into a stateful interaction



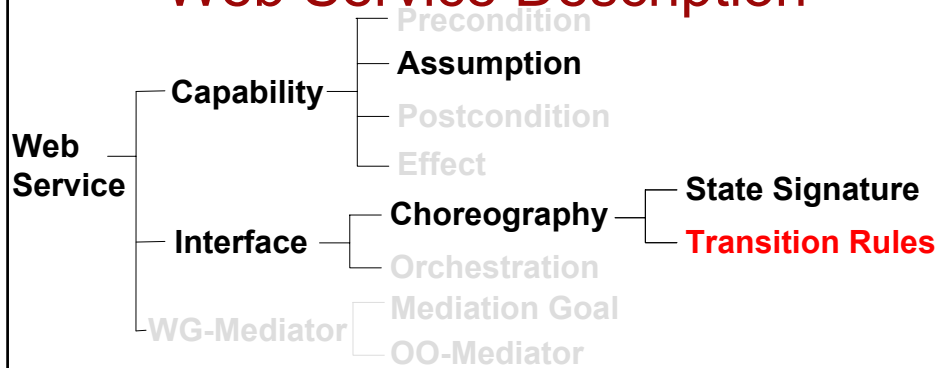
Web Service Description



- Transition rules link communications into a stateful interaction:
 - Transition rules may be used in matching and (process) mediation against goals,



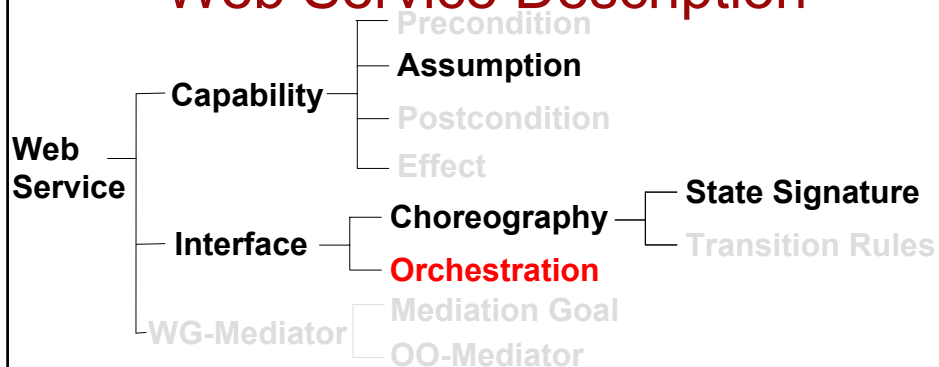
Web Service Description



- Transition rules link communications into a stateful interaction:
 - Transition rules may be used in matching and (process) mediation against goals, or for
 - In process mediation between IRS-III/WSMX



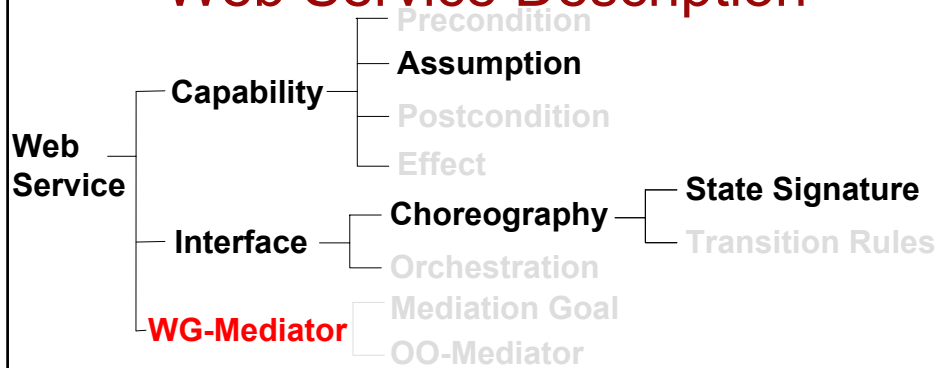
Web Service Description



- Orchestrations describe how composite services achieve their behaviour in terms of communications between its components, which may be goals or



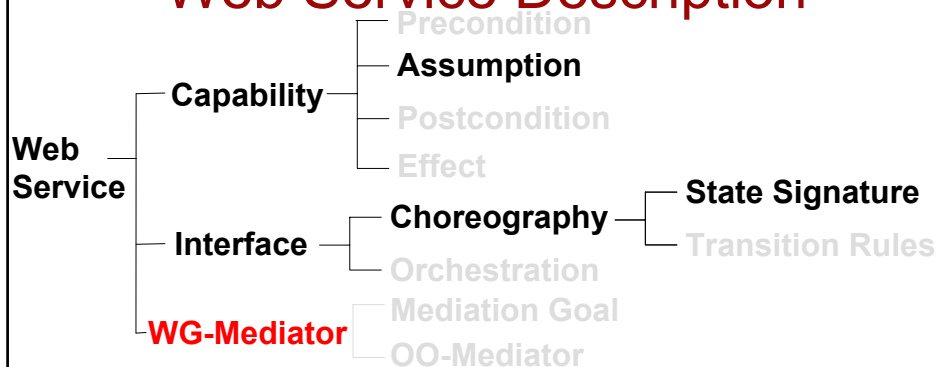
Web Service Description



- WG-Mediators describe which goals are met by a web service



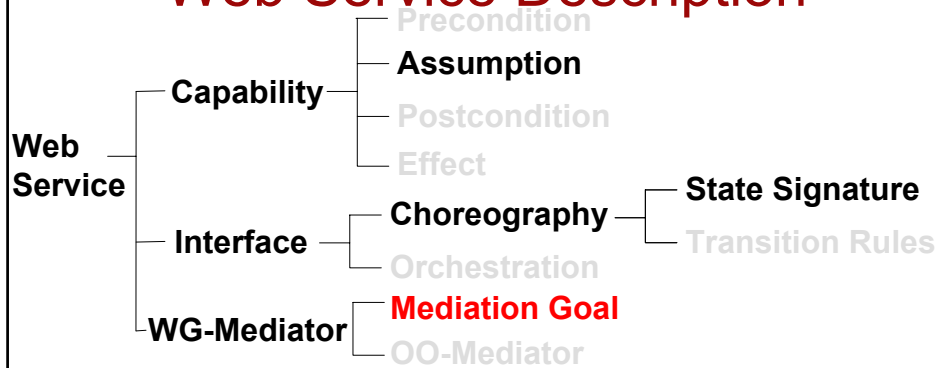
Web Service Description



- WG-Mediators describe which goals are met by a web service;
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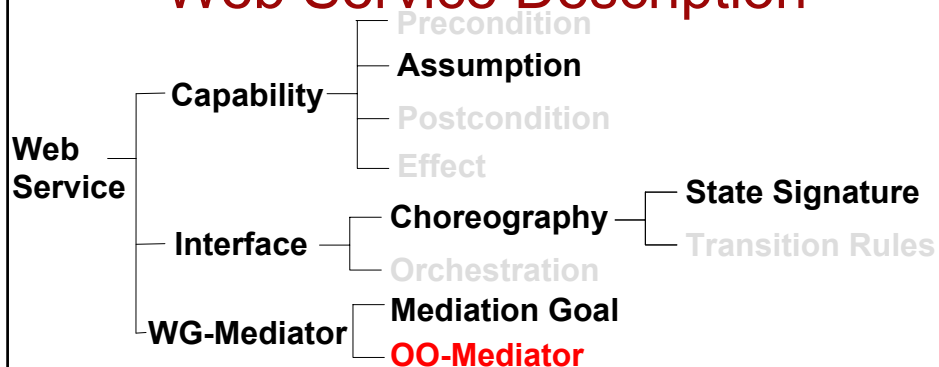
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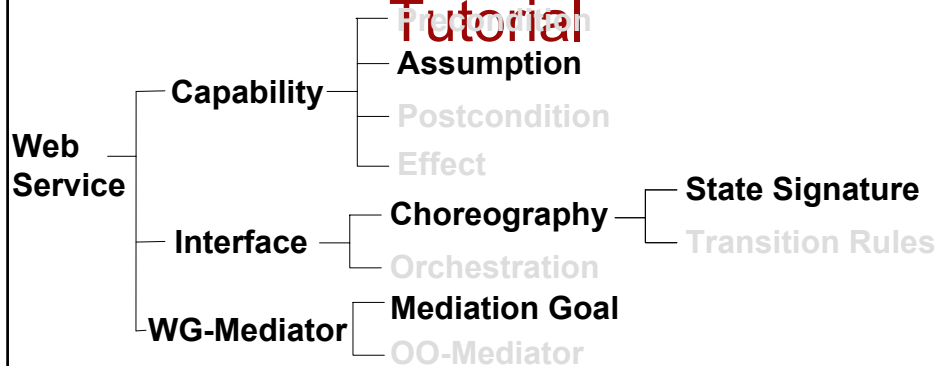
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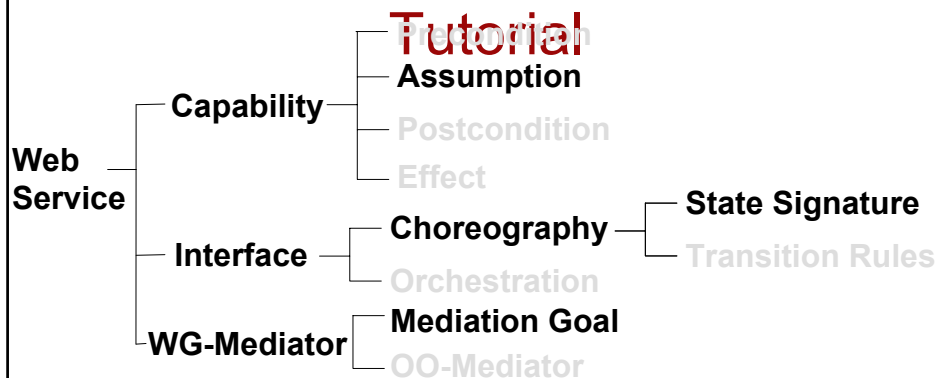
Web Service Description in Tutorial



- The steps that go into describing a service in the tutorial are:



Web Service Description in Tutorial

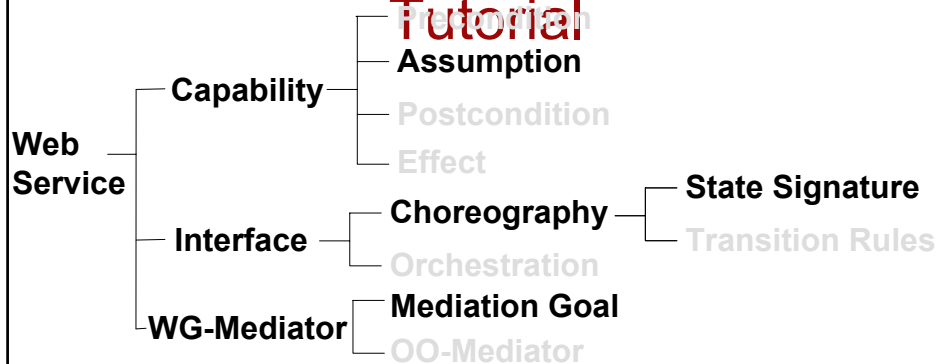


- The steps that go into describing a service in the tutorial are:
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Web Service Description in

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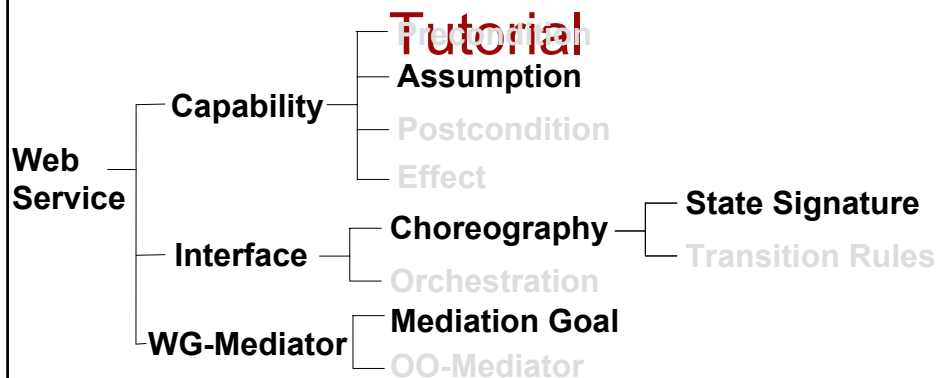


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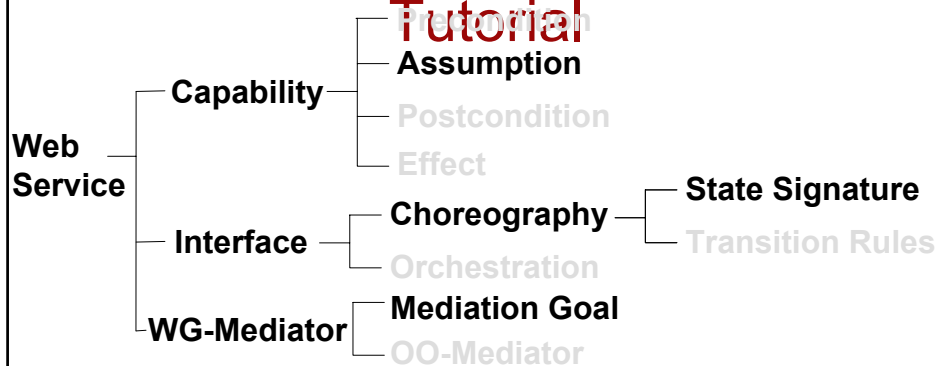


- The steps that go into describing a service in the tutorial are:
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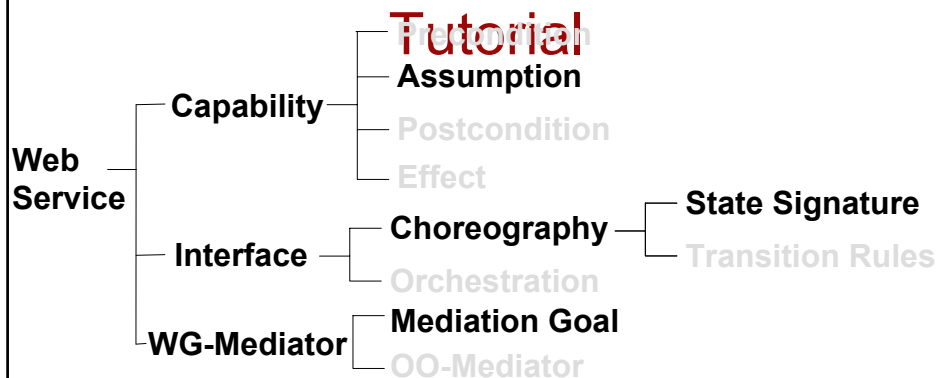


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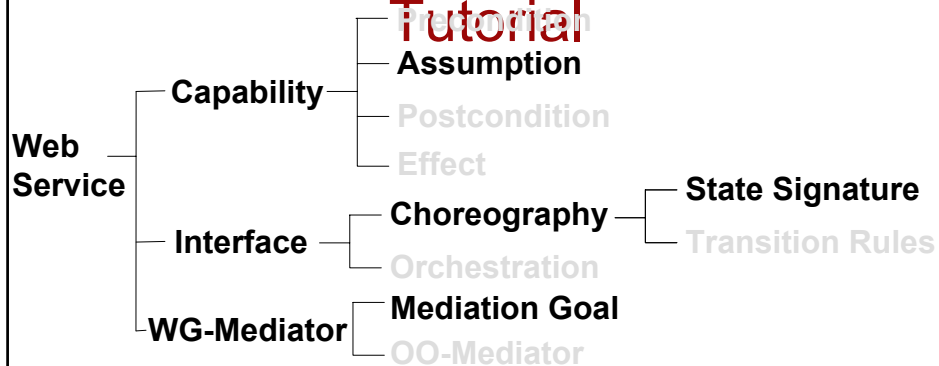


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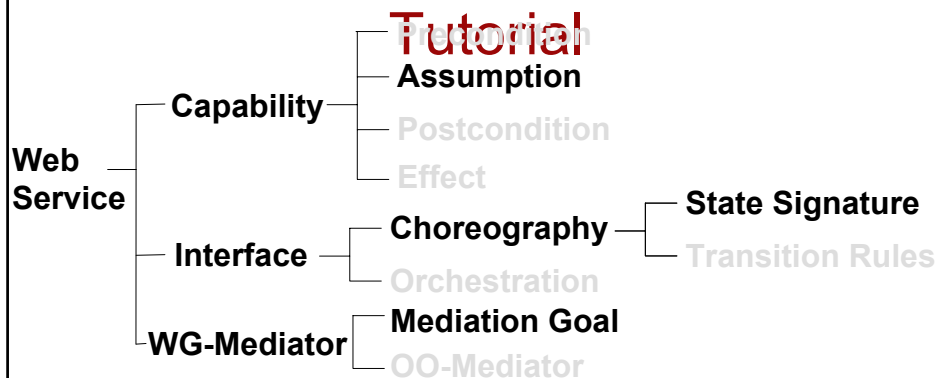


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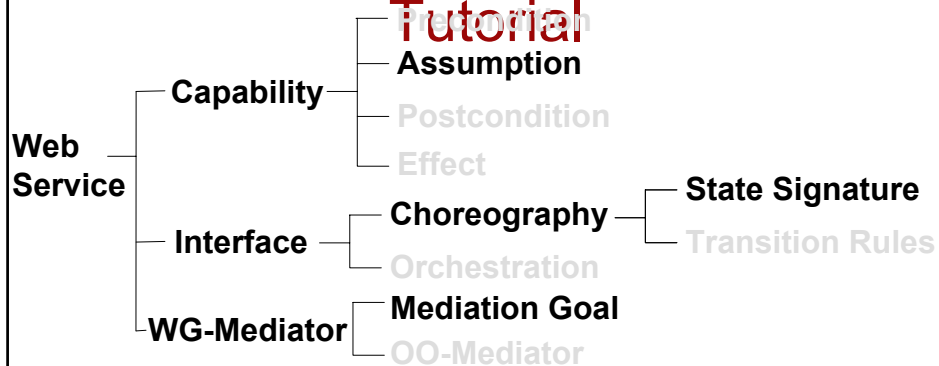


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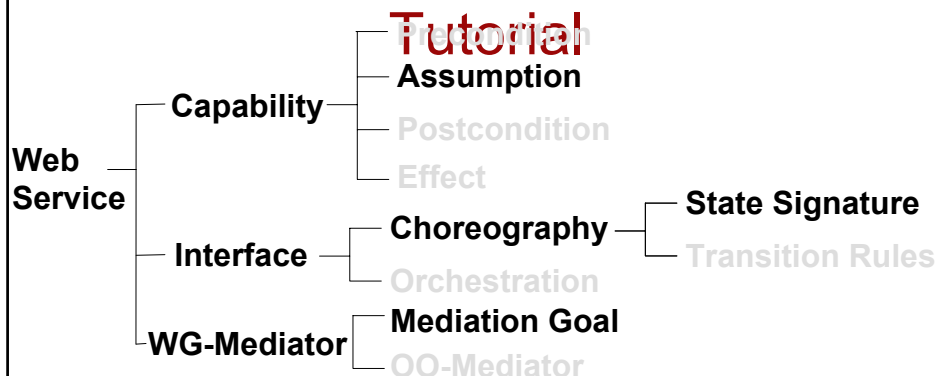


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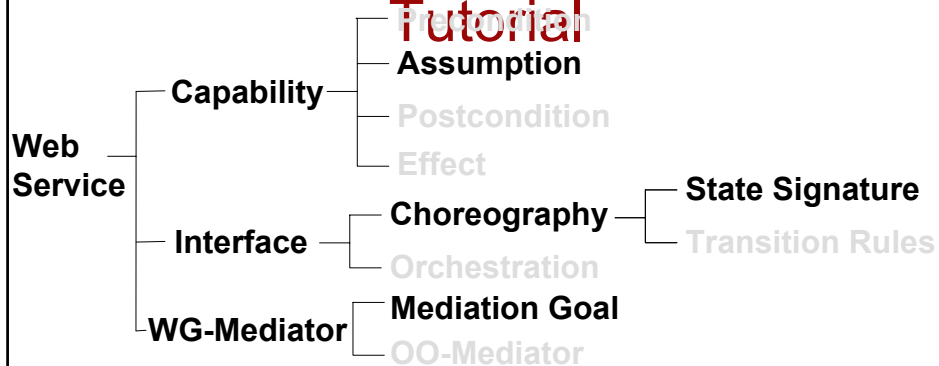
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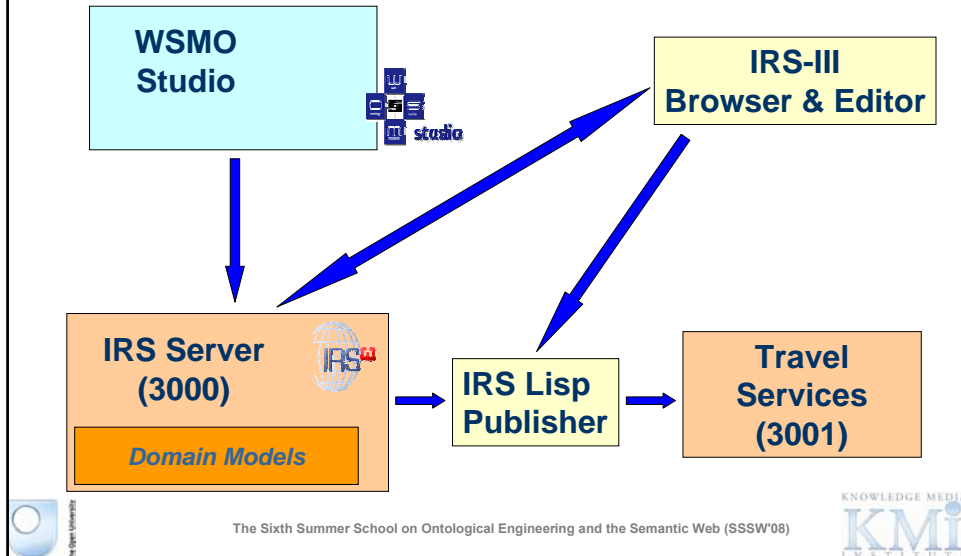


IRS-III Hands On Task

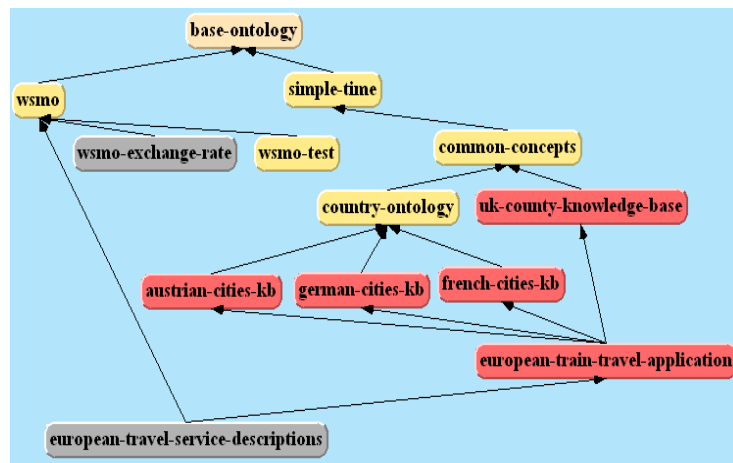
- Develop an application for the European Travel scenario based on SWS. The application should support a person booking a train ticket between 2 European cities at a specific time and date
- The following WSMO Studio tasks are involved:
 - Retrieve domain ontology from IRS;
 - Create WSMO ontology concepts to describe communications;
 - Create WSMO descriptions for Goals, WG-mediators and Web service descriptions;



Tutorial Setup



Travel Related Knowledge Models



Key Classes, Relations, Instances



is-in-country <city> <country> e.g.
 (is-in-country berlin germany) -> true

(student <person>) -> true, for john matt michal
 (business-person <person>) -> true, for liliana michael



Goals

1- Get train timetable

- Inputs: origin and destination cities (city), date (date-and-time, e.g. (18 4 2004))
- Output: timetable (string)

2- Book train

- Inputs: passenger name (person), origin and destination cities, departure time-date (list-date-and-time, e.g. (20 33 16 15 9 2004))
- Output: booking information (string)



Services

- 1 service available for goal 1
 - No constraints

- 6 services available for goal 2
 - As a provider write the constraints applicable to the services to satisfy the goal (assumption logical expressions)

- 1 wg-mediator mediation-service
 - Used to convert time in list format to time in universal format



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Service constraints

- Services 2-5
 - Services for (origin and destination) cities in determined countries

- Service 4-5
 - Need a mediation service to map goal time-date to service time-date

- Services 6-7
 - Services for students or business people in Europe



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Available Functions (1/3)

1- get-train-times

paris london (18 4 2004)

"Timetable of trains from PARIS to LONDON on 18, 4, 2004

5:18

...23:36"

2- book-english-train-journey

christoph milton-keynes london (20 33 16 15 9 2004)

"British Rail: CHRISTOPH is booked on the 66 going from MILTON-KEYNES to LONDON at 16:49, 15, SEPTEMBER 2004. The price is 169 Euros."

3- book-french-train-journey

sinuhe vienna innsbruck (20 33 16 15 9 2004)



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Available Functions (2/3)

4- book-german-train-journey

christoph berlin frankfurt 3304251200

"First Class Booking German Rail (Die Bahn): CHRISTOPH is booked on the 323 going from BERLIN to FRANKFURT at 17:11, 15, SEPTEMBER 2004. The price is 35 Euros."

5- book-austrian-train-journey

sinuhe vienna innsbruck 3304251200

"Austrian Rail (ÖBB): SINUHE is booked on the 367 going from VIENNA to INNSBRUCK at 16:47, 15, SEPTEMBER 2004. The price is 36 Euros."



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Available Functions (3/3)

6- book-student-european-train-journey

john london nice (3 4 6 18 8 2004)

"European Student Rail Travel: JOHN is booked on the 916 going from LONDON to NICE at 6:44, 18, AUGUST 2004. The price is 94 Euros. "

7- book-business-european-train-journey

liliana paris innsbruck (3 4 6 18 8 2004)

"Business Europe: LILIANA is booked on the 461 going from PARIS to INNSBRUCK at 6:12, 18, AUGUST 2004.

The price is 325 Euros."

8- mediate-time (lisp function) or



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