

OPTIMIZATION OF WEB SERVICE CALLS IN THE AXML DOCUMENT

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May 20, 2008

Road Map

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- Aim and the expected outcomes
- Type of Web service call
- Idea of Grouping

Aim and the expected outcomes

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- Aim: To optimize the number of Web service calls which are in the AXML document
- Expected outcomes are,
 - ▣ Reduction of remote service computation (especially when the Web service is connected with the databases)
 - ▣ Reduction of data transfer between the Web service requester (AXML Doc) and Web service provider
 - ▣ Last but not the least, reduction of marshalling/demarshalling process

Type of Web service call

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- The Web service calls which are targeting the same Web service function
 - ▣ independent i.e. located in leaf nodes of AXML doc
- for example, $sc_1 @ p_1(c_1)$, $sc_2 @ p_1(c_2)$
 - ▣ service calls sc_1 and sc_2 are targeting the same peer p_1 with its own condition c_1 or c_2 as parameter
 - ▣ c_1 and c_2 could be identical or subset/superset or different from one another

Idea of Grouping

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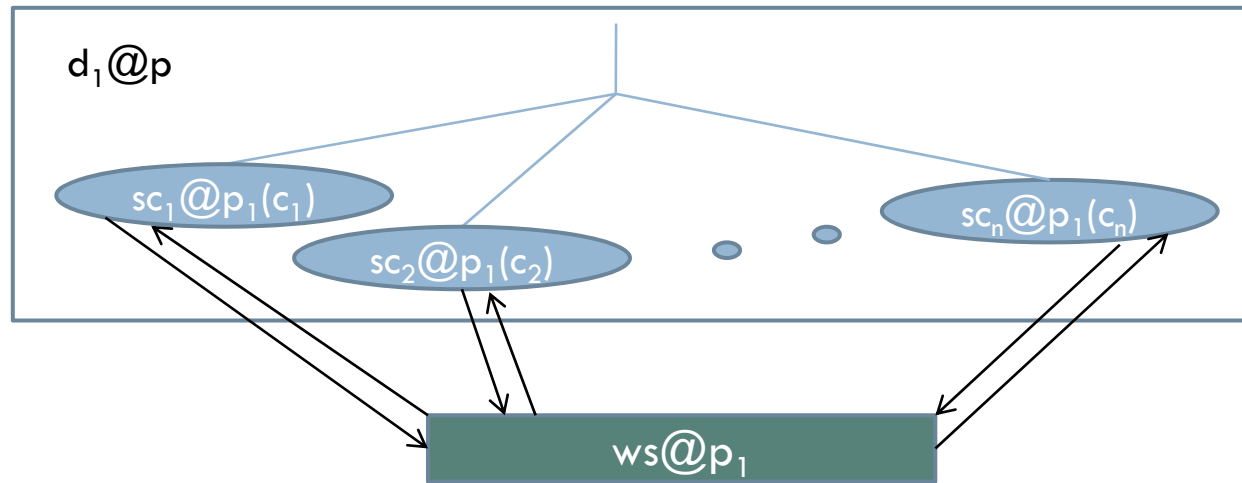


Fig: Before Grouping

Idea of Grouping

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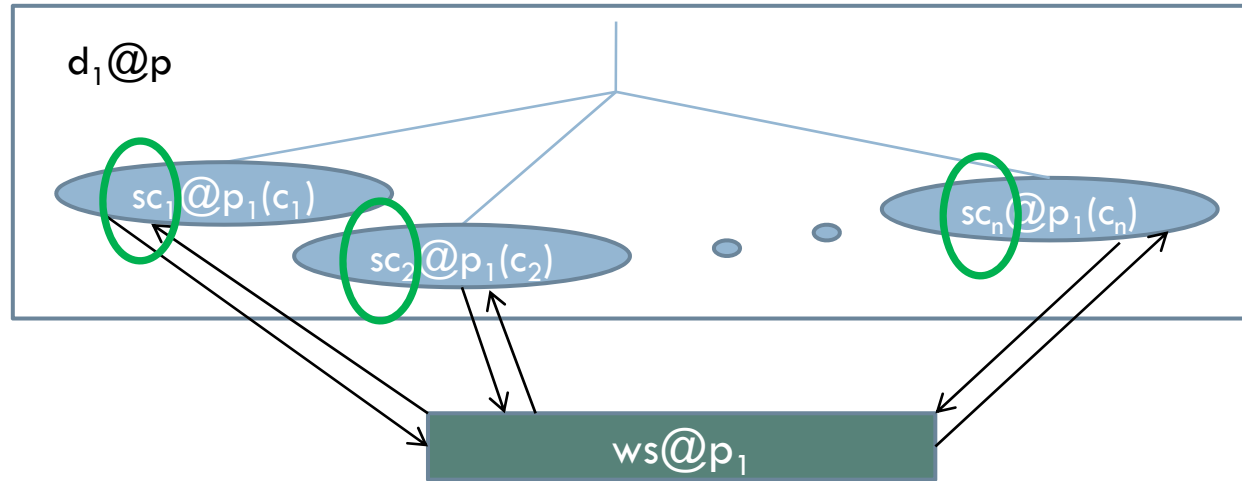


Fig: Before Grouping

sc_1, sc_2, \dots, sc_n are the different id's of the same Web service function

Idea of Grouping

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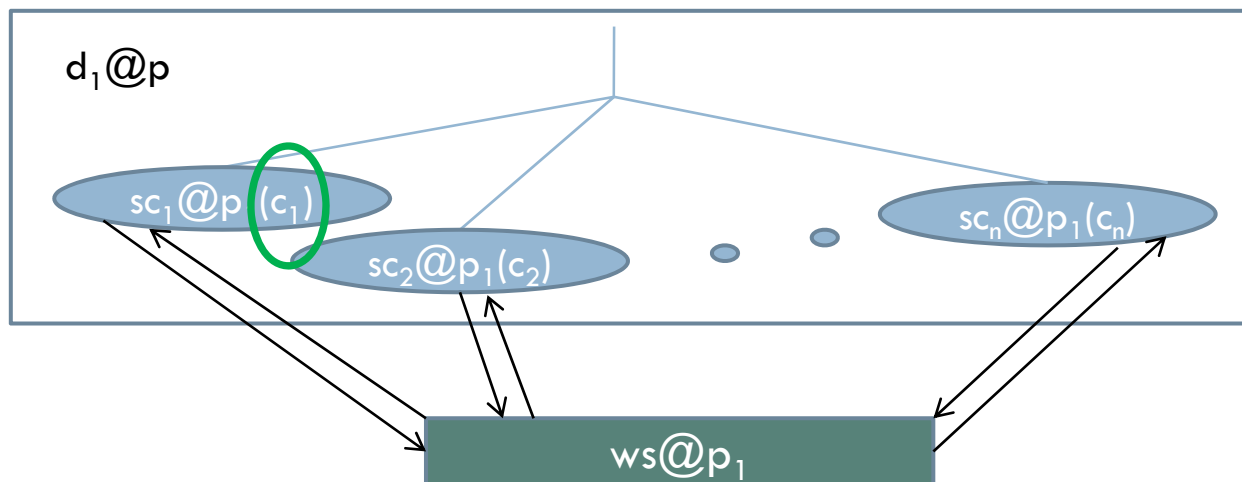


Fig: Before Grouping

Condition c_i is a bool combination of atom in the form of $A_i \theta_i V_i$, where θ_i belongs to $\{=, \neq, <, >, \leq, \geq\}$

Idea of Grouping

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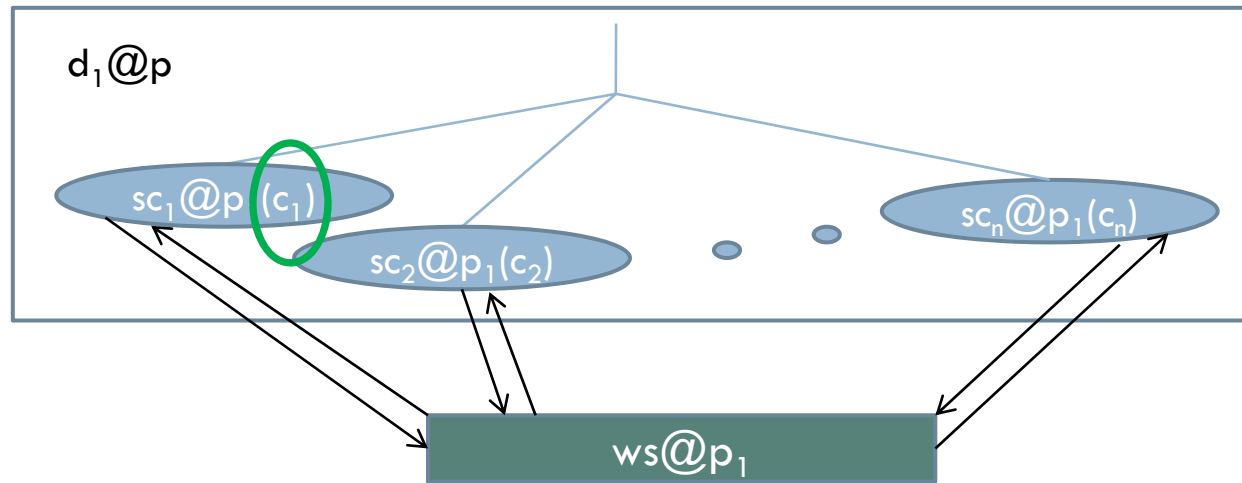


Fig: Before Grouping

Two (or more) conditions are logically connected i.e. $c_i \varnothing c_j$, where \varnothing belongs to $\{\vee, \wedge\}$. For example, condition c_1 could be $c_{11} \wedge c_{12}$.

Idea of Grouping

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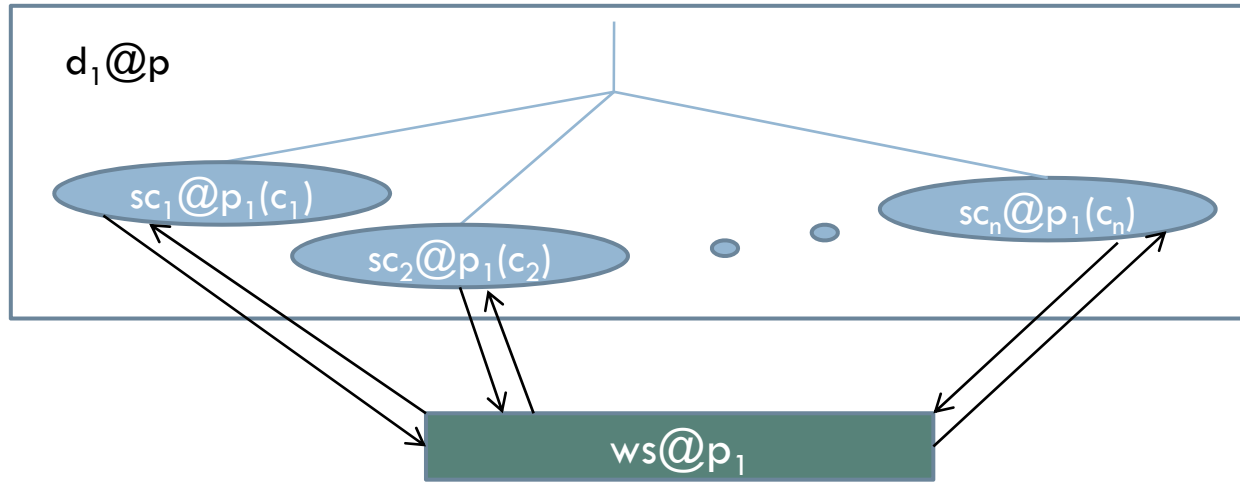


Fig: Before Grouping

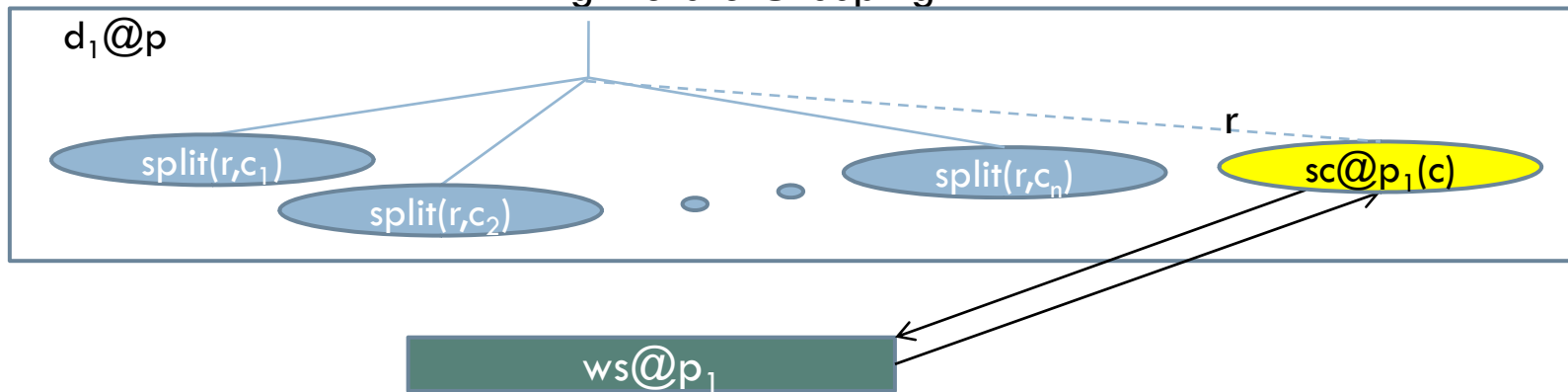


Fig: After Grouping

Idea of Grouping

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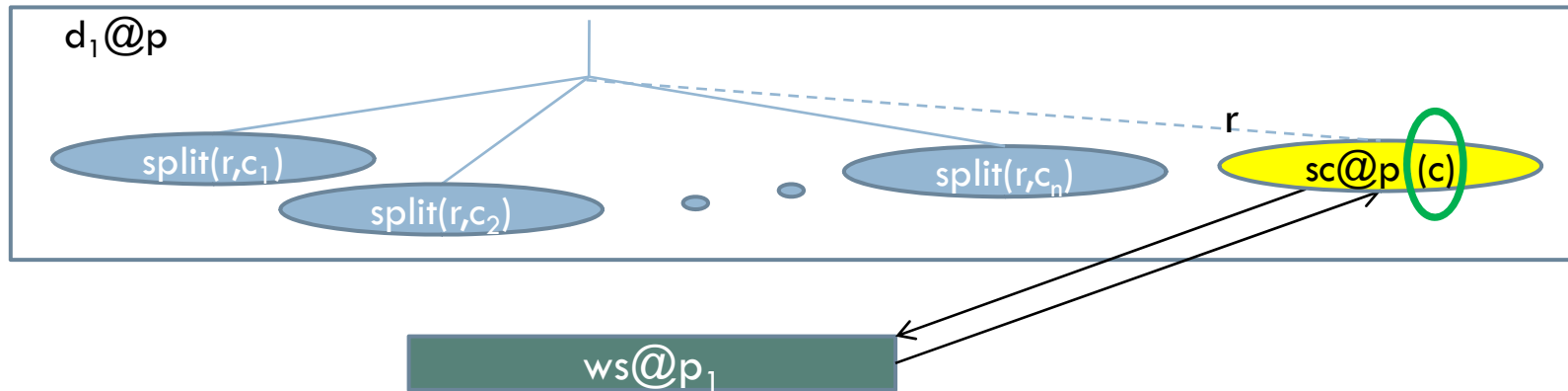
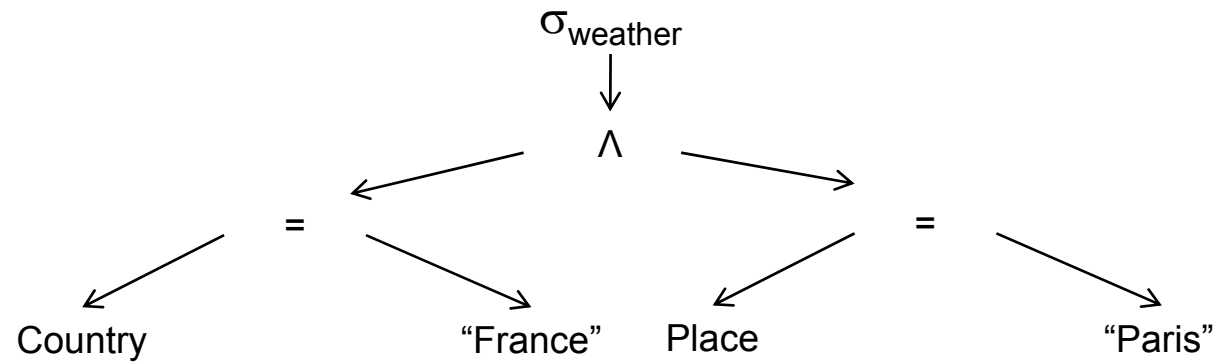


Fig: After Grouping

In the grouped service call sc , condition c is $c_1 \vee c_2 \vee \dots \vee c_n$

Idea of Grouping

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Example of an encoded condition

Idea of Grouping

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- Optimization while grouping the conditions,
 - Given: c_1 of sc_1 , c_2 of sc_2 .
 - Output: c
 - If c_1 and c_2 are exactly same then $c=c_1$
 - Else if c_1 and c_2 are *range type* or *< type* or *≤ type* or *> type* or *≥ type* then
 - update the conditional values of c_1 by looking c_2 (min, max, or both)
 - if the expected results of c_1 and c_2 are different then add those into c_1
 - $c=c_1$
 - Else $c=c_1 \vee c_2$

Idea of Grouping

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□ split could be done in two ways:

1) apply σ_{c_i} or Π_{c_i} in r , where c_i is the condition of service call sc_i

□ It additionally requires the conditional attributes and its values (which are given in c_i) in the service call result r

□ For example,

$sc_1 = \text{select stockRate from StockService where companyType="MNC"}$

$sc_2 = \text{select stockRate from StockService where stockName="dell"}$

$sc_3 = \text{select stockRate from StockService where stockName="yahoo"}$

$sc_4 = \text{select stockRate from StockService where companyType="France"}$

Idea of Grouping

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- After grouping conditions,
 - `sc=select stockRate from StockService where companyType="MNC" or stockName="yahoo" or stockName="dell" or companyType="France"`
 - `sc` could produce the result something like, $r(20\$, 25\$, \dots 15\$)$
 - It is difficult (or impossible) to separate the result r according to the conditions of sc_1 to sc_4
- To solve this, r should also have the conditional attributes and its values, the correct version of `sc` is,
 - `sc=select stockRate, stockName, companyType from StockService where companyType="MNC" or stockName="yahoo" or stockName="dell" or companyType="France"`

Idea of Grouping

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- 2) Web service itself should differentiate the results as per the disjunctive conditions which are supplied in the Web service call
 - For example, $sc(c_1 \vee c_2)$ should get the result in the form of $r(\langle r_1 \rangle, \langle r_2 \rangle)$ where the special brackets $\langle \rangle$ are differentiating the results which are produced with the condition c_1, c_2
 - But, it is difficult to extract the results of hidden condition

Questions?

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Thank you