SOAP Message Serialization with Templating & Caching

Degree of MSc in Computer Science

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I hereby declare that the work included in this dissertation has not been submitted in part or whole for any other academic qualification at any institution.

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Abstract

Web services marked a remarkable milestone in the field of distributed computing. Its predecessors like, Java RMI and .NET Remoting had their own ways of communication and optimized to suit their individual frameworks. The gain was in performance – which led web services to be behind. SOAP message serializing process itself contributes 90% of the performance bottlenecks found in web service communication [11].

The research focuses on improving SOAP message serialization process with Templating and Caching. With Templating, we use a given WSDL to generate SOAP message templates at the time of code generation and in runtime the generated templates will be substituted with input arguments to the web service APIs . These substituted templates will be cached in the SOAP message template repository, with a unique key to identify each web service request. Cached SOAP message requests will be used in subsequent web service calls, if a match found.

With the performance test results obtained, we could witness that Templating & Caching improves the web service performance and the factor of improvement depends on the complexity of objects involved in the web service API call. Also the performance gain due to Templating & Caching increases as the object complexity increases and Templating itself contributes in a larger percentage to the performance gain than the Caching, as the object complexity increases

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Symbols, Notation, Abbreviations and Acronyms

API	Application Programming Interface
AXIOM	Apache aXIs Object Model
CORBA	Common Object Request Broker Architecture
DCE	Distributed Computing Environment
HTTP	Hypertext Transfer Protocol
IDL	Interface Description Language
IIOP	Internet Inter-ORB Protocol
OM	Object Model
ONC	Open Network Connectivity
ORB	Object Request Broker
REST	Representational State Transfer
RMI	Remote Method Invocation
SOAP	Simple Object Access Protocol
StAX	Streaming API for XML
TCP	Transmission Control Protocol
WS-*	Web Service Specifications
WSDL	Web Service Description Language
XML	eXtensible Markup Language