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A proposal for the OSA/Parlay network interface and associated QoS guaranteed network architecture

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Abstract

Telcos are adapting their business to address the rapid changing technology landscape (Moodley and van Olst 2011). Telcos require a flexible architecture to allow seamless adaptation and to leverage these new technologies to gain a competitive advantage (Moodley and van Olst 2011). This research is focused on the *transport stratum* as an extension to the OSA/Parlay gateway. The proposed OSA/Parlay Network Architecture and Interface has been designed. The OSA/Parlay Network Interface is characterised by *openness, simplicity, API* based, *QoS* support and *technology independence*. The OSA/Parlay Network Architecture features *simplicity, technology independence, QoS mechanisms; call admission control; intelligent routing* and supporting both *federation* of telcos and interoperation of *legacy* technologies. The OSA/Parlay Network Architecture and Interface has been demonstrated over a Java based Distributed Processing Environment (DPE) using CORBA. These architectural concepts and principles are demonstrated in a simulated environment and illustrate the Next Generation Network architectural characteristics.

The research contribution therefore achieves an open architecture allowing for 3rd party application developers while also ensuring that call and service requests are provisioned end-to-end with guaranteed application level QoS in the transport network. The OSA/Parlay Network Architecture and Network Interface is synthesised from existing architectural standards and provides the following benefits. It is an extension of the OSA/Parlay standard by including the OSA/Parlay Network Architecture and Network Interface realises the OSA/Parlay next generation network. Both the OSA/Parlay Network Interface and the Network Architecture is specified in a technology agnostic manner. This ensures that the architecture remains future proof as it is not reliant on any particular technology. The long sought after Application level QoS is integrated into the architecture. The periodic network state updates inform the central Connection Coordinator object of both topological network changes as well as current performance of the constituent parts of the network. Intelligent routing of connections is achieved by adapting the Dijkstra algorithm to compute the best path based on dynamic network performance and is tested against QoS requirements, while the call admission control decision naturally allows for load balancing of connection paths within the network. This QoS mechanism achieves the goal of guaranteed QoS for a call admitted into the network.