The Personalized Universal Media Access (PUMA) project at L3S Research Center embraces the vision of accessing multimedia data anywhere anytime from a variety of client devices. Today this is usually facilitated out of a plethora of complex applications. But building and maintaining such complex large scale multimedia systems is always a difficult, costly, time-consuming and challenging problem. Service-based architectures and the possibility to flexibly reuse services for different workflows and compose basic services to implement more complex workflows (or rather execution flows), as proposed in the Web and Grid communities, can provide a possible solution to this problem.

However, due to the special characteristics of multimedia applications and the rich semantic structure of multimedia data and workflows, Web or Grid-based research results still cannot be readily applied. When moving from monolithic applications towards service-oriented Multimedia frameworks, especially the seamless composition of services to form complex multimedia workflows becomes a demanding problem. Networked or mobile client devices show limited capabilities and require a flexible composition strategy as they often have to move computationally complex or power-demanding tasks to powerful servers. Such a strategy also has to consider the changing environment due to movements of the device and it has to adapt to device-specific characteristics, e.g., the current battery level. Hence, the selection, execution and monitoring of chains of Web services and graceful recovery from failures of individual services and network-specific or device-specific alarms are important aspects to realize service-oriented multimedia applications.

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