Chapter XLIII
Policy–Based Mobile Computing

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ABSTRACT

Mobile computing is associated with mobility of hardware, data and software in computer applications. With growing mobile users, dynamicity in catering of mobile services becomes and important issue. Polices define the overall behavior of the system. Policy based approaches are very dynamic in nature because the events are triggered dynamically through policies, thereby suiting mobile applications. Much of the existing architectures fail to address important issues such as dynamicity in providing service, Service Level provisioning, policy based QoS and security aspects in mobile systems. In this chapter we propose policy based architectures and test results catering to different needs of mobile computing

INTRODUCTION

Policies are rules that govern the overall functioning of the system. *Policy computing* is used in a variety of areas. *Mobile computing,* with its ever-expanding networks and ever-growing number of users, needs to effectively implement a policy-based approach to enhance data communication. This can result in increasing customer satisfaction as well as efficient mobile network management.

POLICY COMPUTING AND NEED FOR POLICY-BASED MOBILE COMPUTING

Policies in society and organizations are often captured and enforced as laws, rules, procedures, contracts, agreements, and memorandums. Policies are rules that govern the choices of system behavior. A policy is defined as "a definite goal, course or method of action to

guide and determine present and future decisions." Security policies define what actions are permitted or not permitted, for what or for whom, and under what conditions. Management policies define what actions need to be carried out when specific events occur within a system or what resources must be allocated under specific conditions. They are widely used for the mobile user whose requirements are dynamic.

Policy-based computing is the art of using policy-based approaches for effective and efficient computing; it is widely used because of its dynamicity. Hence in areas such as mobile computing, policy computing can be effectively used.

Much of the existing network systems' are configured statically (Fankhauser, Schweikert, & Plattner, 1999). In the present-day scenario, the number of mobile/wireless network users increases day by day. With the static systems being deployed, it is very difficult to achieve the needed dynamicity for mobile computing resulting from changing user base. In order to achieve efficient communication for fluctuating user base, policy-based systems need to be implemented in different areas of the existing wireless mobile network infrastructure.

POLICY IN MOBILE COMPUTING

Mobile computing is conducted by intermittently connected users who access network resources that need to escalate with increasing computing needs. Mobile computing has expanded the role of broadcast radio in data communication, and with increasing users, providing quality service becomes a challenging issue. The mobile users must be provided with the best possible service so that the service provider can stay in competition with peer service providers. In order for the best possible

service to be provided to the mobile users, there are certain criteria that should be met. They are:

- The quality of service should be guaranteed.
- There should be effective service-level agreement (SLA) between the mobile user and the service provider.
- Security should be foolproof.

With the existing system (without a policy-based approach), it becomes very difficult to achieve the mentioned criteria. It is very difficult to provide a guaranteed quality of service (QoS), which is also dynamic (not statically configured). Moreover SLA is a very static procedure. Because of the mobility and dynamicity of mobile networks, SLAs also must be made very dynamic. Similarly, security should also be made very dynamic and efficient. To overcome all these shortcomings of the existing system, *a policy-based approach should be used in mobile networks.*

Policy computing can be effectively implemented in mobile networks using policy compilers. Policies can be written in different ways. There are different languages for writing policies that are used for different purposes of specifying policies. In order that the "security policies" be specified, languages such as Trust Policy Language (TPL), LaSCO, and so forth are used. In a similar way, for specifying management-related policies, languages such as Ponder, Policy Maker, and so forth are used. Thus for different scopes of application of policies, specific languages are used.

Policy validation checks a solution's conformance to the policy file. The actual process of policy validation has three primary stages. First, a node or hierarchy change event in Solution Explorer (such as add, drag, or delete event) begins the validation process. Then the

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