From the Editor in Chief...

Privacy for Telecom Services

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Third-party services potentially have great value to all concerned — users, service providers, and telecom operators — but significant challenges arise when subscribers can personalize them. The main problem stems from the release of privileged subscriber information to external service providers: if the providers violate subscribers' privacy, telecom operators are liable. Last issue I discussed the charms and hazards third-party services have for telecom operators; in this issue, I'll discuss a technical approach that avoids the liability risk.

Subscribers have subtle criteria for revealing information to service providers.

My approach involves a fairly straightforward application of agent technology and a simple architecture. Each subscriber is assigned an agent, which represents the user's interests. Although it isn't mandatory, each service can also be assigned an agent to derive the most benefit. A service agent could negotiate with subscriber agents regarding information and authorizations versus the quality of the offered service.

Subscribers sign on and off services through their agents, so subscriber agents always know what services their users are signed up for. They also know their users' preferences for each service, particularly in regard to sharing personal information with the service.

Controlling Information Flow

Let's begin with a scenario where the telecom operator is a trusted party that hosts all subscriber agents. The operator's transport and signaling capabilities connect subscribers to their agents. Interactions between a subscriber and a service pass through the subscriber's agent, and the agent conveys available subscriber information to the service provider.

For effective personalization, the service provider needs subscriber information, which the user's agent should be able to supply. Subscribers shouldn't have to enter information such as their name or shipping address every time they sign up for a service, for example. Moreover, subscribers might not have a precise handle on some types of information. An operator's network would know subscriber geographical locations, for example, but there is generally no reason for subscribers to know their latitude and longitude. A service, however, might rely on that information to compute the correct behavior for users in different regions.

If the subscriber agent is responsible for conveying the necessary information to the service, it can ensure that the correct information is gathered and that it releases only the information the subscriber wants the service provider to have.

Capturing User Constraints

Capturing subscribers' wishes would not be easy, however, because users have subtle criteria for revealing information to service providers. A subscriber might have to inform an office groupware service of his or her location, for example, but only during work hours. And, although a subscriber might willingly and happily reveal this information to a follow-me service that redirects incoming phone calls based on location, the subscriber would not want that information revealed to a service that sends advertisements for local vendors.

When there are few services, subscribers can set their preferences manually. If the preferences are more than on/off decisions, however, setting them can quickly become tedious, because the rules involved could be cognitively cumbersome and their ramifications might not become clear until they allow something the subscriber did not expect.

Agents can capture the constraints or policies that subscribers want to enforce with regard to

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their privileged information. An agent-based interface can also suggest the constraints the subscriber might wish to enforce based on the given service's properties. This would require an ontology of services and would benefit from self-describing services. For example, an enterprise service might be given location information during office hours and informed only if the user's phone is on during off hours.

Agents don't have to be placed within the telecom network. They can just as easily be located on the edge of the network, provided they have access to the information they need. In other words, privacy management can be a specially trusted service that is given authority over other services.

Technology Below Policy

Privacy is a critical challenge for the spread of telecom networks and services. Even the regulatory and political aspects of privacy must ultimately be realized through technical means. And for the right technical means to apply, the system architecture must allow it. Sure, the agent-based architecture is obvious. That is the beauty of it.

Farewell to Linda World

Linda World, *IEEE Internet Computing*'s founding managing editor, is leaving the magazine. Linda was a key player in *IC*'s successful launch five years ago, and since then she has helped refine the processes we use today. *IC*'s continuing stature as one of the most popular IEEE publications is due in no small measure to Linda's efforts.

We are consoled by the fact that Linda is not moving far: she will remain with the IEEE Computer Society, working on its flagship magazine, *Computer*. For the next several months, Linda will also continue to help *IC* with acquisitions.

We wish her all the best.

—Munindar Singh

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