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Service Platforms:
Finding Needles in Haystacks

Strategic Business Relevance: The explosion in smartphone sales, Apple's App Store and the Android Marketplace give today's consumer unparalleled choice when choosing services that might meet their needs. This is only the tip of the iceberg. New NFC enabled phones, 2D barcodes and technologies like Bluetooth give consumers ad-hoc access to services embedded in their environment. All of this begs two questions: How do consumers find the best services for them? How do companies differentiate their services and enable consumers to find them?

Rich Services in an Interactive World

To enable companies to publish services and help consumers to find them, an underlying platform is needed to support the necessary actions. Current service platforms fall into two major groups:

1. B2B platforms based on SOA middlewares. These allow rich descriptions of services, and enable automated service to need matching, but aren't consumer facing.

2. Consumer facing markets such as Apple's App Store and the Android Marketplace. These offer a simple publishing API, and are ranked by users of the markets. They don't allow sophisticated value-based discovery.

Neither group supports ad hoc discovery of services embedded in the environment, e.g. Bluetooth beacons advertising real world services will not show up in a consumer's Android Marketplace, even though a consumer might be standing next to the source.

Middleware and architectures that take these three key elements - rich service descriptions, ad-hoc service discovery and consumer facing markets – are being explored to provide companies with the tools to publish services in ways that allow consumers to discover them based on values and service capabilities.

Core Research:
User Interactions for Breakthrough Services

This research addresses the ways in which users interact with portable and mobile devices (and other devices in their physical and logical environment – not just mobile phones) in order to enable new types of personalised and highly contextualised services.

This part of the programme – Simplifying Service Awareness & Transparency - aims to provide tools that engage the consumer, better capture his needs, and enable him to discover services that meet those needs in an intuitive way.

Virtual Centre of Excellence in mobile and personal communications

MOBILE VCE

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Service Platforms for ad hoc service discovery and rich service descriptions

This work is focused on two areas - technologies that can enable rich service descriptions and those that enable ad hoc service discovery.
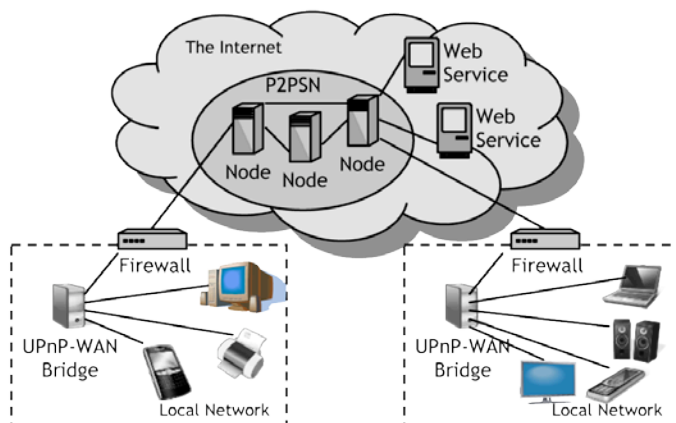
Rich service descriptions allow companies to express the capabilities of services they wish to publish in such a way that we can automatically reason about those services, match them to consumer needs, and create service markets where machine-based agents can negotiate appropriate service contracts. Drawing on the Semantic Web and associated technologies, we are developing OWL-S based ontologies that allow descriptions including inputs, outputs, pre-conditions and effects.

Ad hoc service discovery allows users to discover and use services they come across in their day-to-day environment. At the same time we wish to make globally published services available to mobile users and allow users to pick and choose the most appropriate. We have looked into a number of existing technologies and are pursuing solutions that fuse peer-to-peer networks, existing service technologies and local-discoverytechnologies like UPnP to provide a unified platform for local and global service discovery.

In our ongoing research, we are building composition tools, and conducting studies to investigate appropriate user interfaces for such tools. Research will concentrate on how these tools interpret user inputs and build appropriate semantic searches to find services for composition, as well as how such tools represent the composition process – e.g. which services can be composed with which others? How does a user know that the composite service meets her requirements?

Proof-of-concept implementation is underway to support service discovery, access and usage across domains – for example, use of personal services from a user's domestic environment whilst visiting friends. The implementation currently supports UPnP device discovery between two private networks, each behind firewalls, with support of access, usage and service filtering as planned next steps.

An example architecture connecting local and global service networks

Key Points

- Creating rich service descriptions allows companies to better specify their services and differentiate them from other offerings. Such descriptions better allow consumers to identify services that meet their needs, based on requirements and values they hold.

- Existing service platforms do not provide mechanisms for ad hoc service discovery. Enabling ad hoc discovery enables more 'infrastructure-lite' services embedded in the environment.

- VCE's evolving toolkit enables platforms that are extensible and scalable, allowing future appearance of new service types and growth in numbers..

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