Wireless World Research Forum (WWRF)

(a) Title of the research item: A Search Engine for a Wireless Internet

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II Subject Area: Co-operative Networks (WG3 – New Communication Environment and Heterogeneous Networks)

III Motivation for research

Emerging trends point to more intelligent networks that dynamically configure themselves in an Ad-hoc fashion. Visionary surrealists have toyed with our imagination, suggesting alternative human machine interaction.However intelligent Machine-Machine interaction is as yet, not here. The vision we see is that of a Wireless Internet that is quite different to the current Internet visionaries. Key to this vision is the idea of having an environment that is presence aware and populated with dynamic content provision provided through ad-hoc network formation.

Central to this vision is the concept of intelligence or put more simply how the wireless devices and humans interact with each other. Today in the fixed Internet world when we look at content delivery we are immediately presented with the idea of web services. Key to this, is the idea of interoperability and communication of services. Much work has been done in the area of Service discovery which could be over simplified as meta data modeling combined with standard interfaces. Put simply the problem of describing interfaces we believe can easily be solved, and has been solved, in many incompatibly standard ways, i.e. Corba IDL, XML, etc. The problem we want to see solved is bridging the semantic gap between what users want and what computers can handle. In the new wireless age we see service discovery as a much more ambitious goal than mere interface description.

Today the Internet users are all to fimilar with the trials and tribulations of information retrieval and searching on the internet[1]. Combine this experience and add the dynamic nature of a ubiquitous wireless environment, we invision a greater degree of complexity for the user unless inroads are made into this vast area. Ambient Intelligence is one such research area that has emerged in recent times which is attempting to make a breakthrough into this domain. Crucial to this endevour is the challenge of providing a combined machine/human – machine sevice interactive enviroment.

IV Current Techniques

There are a plethora of different techniques employed today in the area of sevice discovery, some of which many people will be familiar with, LDAP, Jini Lookup Services, UDDI, JXTA[2] etc. Although quite different technologies, they display many similar characteristics and fall prey to many of the same shortcomings. Some the the defining characteristics that apply to the current generation of service discovery mechanisms is the underlying network on which they are hosted. The fixed internet as we know it today is a fairly reliable medium, at least in comparison to the world of wireless . There is a general assumption of always connected, centralised, high availablility points of reference. These points of reference as applied to service discovery can be search engines, lookup servers, directory servers (such as LDAP), databases, etc. The two general approaches to service discovery are to either contact one of these well known directory/lookup services or broadcast a message in the hope that one such service will reply.

V Possible approach

Looking at what has come before us is some times a good idea in gaining insight into the future. However when it comes to the wireless internet we believe this could be a bad thing. The evolution of the internet could be summarised as an *after thought*. Most of the advances have been bolt-ons to existing weak technical approachs[5]. This has created a landscape of disparity when it comes to the differing approaches.

When we think of the future wireless internet we should immediately think of decentralised dynamic networks, leaving behind the hierarchical approach of 2G/3G radio networks. We should of course realise that resource constraints are all around use. The concepts of perception of quaility should be paramount in this new world, service classification : {fast,.. slow} should not be thought of in bits and bytes but in terms of user experience. Wireless service should be delivered over whatever infrastructure is available to you. The ability of delivering these services to the user in a context aware manner should be central to service discovery and deployment.

For the successful creation of such an environment the software paradigms by which we create this information have to be re-addressed. Encapsulating human interaction with search and discovery activities will be key to resolving this challenging dilema. The combination of

peer-2-peer computing with intelligent service discovery provides a perfect enviroment for wireless searching. Utilising these tools a smarter user connectivaty patterns can be established over a time sensentive domain, allowing more precise information reterival.

List of References

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