CSC2231 – Internet Systems and Services

Paper Review – The Sybil Attack
Name: **Alex Wun**
Date: **Nov. 16th, 05**

Douceur presents the argument that in practical large-scale distributed systems, it is not possible to distinguish two physical entities without relying (either explicitly or implicitly) on a centralized trusted authority of some kind. Fundamentally, Douceur's arguments are based on the claim that two physical entities can be distinguished if and only if they can perform some task that would be impossible for a single entity to perform. As such, all entities in the distributed system must have similar resources. Otherwise a single entity can abuse its additional resources to spoof multiple entities. The highly heterogeneous nature of distributed systems coupled with the impractical requirements of the identification algorithm form the proof of the author's argument.

The paper's conclusion implies that truly distributed systems will not be possible if being able to identify distinctness is a requirement. They will forever (at some level) depend on a centralized component for correctness.

It is interesting to note that there is a great deal of work in distributed systems that focus on *hiding* distinctness. Virtualization, translation mapping, and proxies are all examples that enable a single entity to masquerade as multiple entities. These concepts are widely deployed in all distributed systems and are completely opposite to the concept of identifying distinctness. This questions whether distinctness is a compelling pursuit.

Additionally, there is an abundance of centralized authorities to depend on. Fundamentally, distributed systems will always be able to rely on the implicit authorities that provide MAC addresses, serial numbers, and other deeply ingrained uniqueness identifiers. This brings into question whether there will ever be a true distributed system. Even sensor networks will likely employ IPv6 or a similar scheme to identify every single mote.