I propose introducing a distinction between physical nodes

and virtual nodes

which I think will perhaps help clarify various discussions around nodes, identities, engines, and naming. Concepts are as follows:

A physical node

is a particular physical computer run within and by an agent. Specifically, we can say that the agent dedicates a certain amount of storage, compute, and bandwidth resources to the node (these can change over time), configures it with their preferences, and the node runs autonomously using those resources, periodically soliciting or responding to inputs from the agent. Physical nodes are addressable only

to other physical nodes who are physically connected to them, who address them by physical connection identifiers (such as an IP address, Bluetooth ID, etc. - but note that we have a weaker naming requirement than IP, we do not require that these names have meaningful semantics to any other physical nodes beyond the one to which they were given). In general, parties external to a particular physical node have no way to verify whether two distinct names correspond to the “same” physical node or not.

A virtual node

is a network subgraph of physical nodes which collectively know a particular internal identity, in the sense that they can produce a valid signature for the corresponding external identity attesting to the association with the physical nodes included in the subgraph. How exactly they produce that signature may vary - it could be from many physical nodes simply keeping copies of the internal identity, or from a more sophisticated kind of threshold cryptography protocol. Note that a single physical node who generates a keypair is also a virtual node (just a subgraph of 1). Virtual nodes are addressable by their external identity, which is a global identifier.

cc @isheff @tg-x @Moonchild @nzarin for feedback here