The Intercloud: Cloud Interoperability at Internet Scale

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Abstract — Today, Cloud Computing is seen largely as isolated providers or enterprise instances of a special kind of hosting or application container. Virtual Machines, or managed code executing against Cloud API’s, are limited to that provider or that enterprise in terms of direct context or reach. This reminds us very much of the state of networking before the Internet where LANs of various domains and protocols did not interconnect. It will either be history repeating, or our collective manifest destiny, to evolve Cloud Computing to a worldwide, interoperable, transparent platform. In other words, Cloud will become to Computing just what the Internet is for Data. Unfortunately, there are many aspects of the platform on which Cloud Computing depends which are preventing this. For example, for the Internet to work, someone had to invent IP addressing, Domain Name Service, Peering and Routing protocols such as AS numbering, OSPF and BGP, and Certificates to enable SSL. In Cloud, for the broader vision of Cloud Interoperability to work, ranging from VM mobility to storage federation to multicast and media streaming interoperability to identity and presence and everything in between, analogous technologies need to be invented. This talk overviews the “grand challenges” in making such changes on the scale of the Internet, and then speaks to specific work completed to-date and in-progress in standards bodies. The attendee will leave the talk with a new understanding of how following the blueprints of the Internet itself (exchange and peering, geographical dispersion, etc) are enabling Cloud Interoperability at a fundamental level. This is what is being called the “Intercloud.”