Content-Centric Networking Protocol:
A solution to radically reduce the cost of content distribution in IP/TV networks

PARC has developed a communications protocol complementing existing IP infrastructure to dramatically reduce the cost of distributing video and other content in IP/TV networks. Content-Centric Networking (CCN) uses a unique architecture that caches content at the packet level, at every node, as part of the network itself. This provides superior performance to application layer Content Distribution Networks because content is cached closest to users who request it most, and with very fine grained responsiveness to changes in both location and traffic mix—all available as part of a network layer, not the application. Wherever IP is extended to the edge, CCN can be deployed to significantly reduce network capital cost, at the lowest operating expense. The CCN protocol can be deployed as an overlay on IP or as a standalone protocol.

OVERVIEW:
IP/TV network operators are being challenged by conventional competitors as well as by unconventional players such as over-the-top (OTT) vendors and Google. While operators of IP/TV networks have been able to jump ahead in this race by securing premium content deals and providing guaranteed Quality-of-Experience (QoE), they will have to address the challenge of how to more efficiently distribute content, especially Video on Demand (VOD), if they are to reduce the capital expense of operating their network to stay in the game. As price pressures accumulate, incremental improvements in network efficiency will not suffice, and a fundamentally new architecture will be required. Caching popular content as far out at the edge of the network as close to the user as possible is the desired new architecture.
**PARC Solution**

PARC’s CCN solution is a caching architecture that re-imagines the way data is stored and transmitted across networks. Because the content is stored in each node (for a period of time), the number of repeated trips across the entire network to fetch the same content can be significantly reduced. CCN offers significant advantages beyond just caching content at the edge. CCN secures content by cryptographically binding the content bits with the content name, along with the identity of its publisher, and uses encryption to protect the content, thus not relying solely on attempts to secure the content container or pipe it travels across. Content producers and distributors will find this security model much more attractive than a conventional one.

Because CCN abstracts machine addresses by using packets to address content itself instead of its location, much of the deployment cost associated with configuring server addresses when setting up new hardware such as a set-top box (STB) subscribers can become obviated. Based on the caching advantage alone, it is believed that CCN can reduce the network bandwidth requirements by up to 60% or more and can bring the cost of transporting 1Gig of content below one-tenth of 1 cent.

In comparison to any other software method for edge caching, CCN can provide:

- Faster, cheaper, more automated response to dynamically changing traffic patterns
- Software implemented in a B-RAS line card, as opposed to a server
- Far stronger security of content, to benefit producers and distributors
- Caching of *ANY* type of content

**Commercialization Status**

PARC released an early stage open source implementation of the core CCN protocol in September 2009. PARC is interested in expanding its partnerships with leading IP/TV equipment manufacturers and network operators to co-develop IP/TV specific CCN applications.

**More Information**

Business Development
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