Imagine a true digital home where an Ethernet backbone carries all kinds of content and control information (multi-room entertainment, hi-def video, automation, security, online gaming, etc.)

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NETSTREAMS.

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What's all this you've been hearing about IP?

It wasn't so long ago that technical terms like IP, short for Internet Protocol, were heard only in the conversations of techies, geeks, and other digitally-driven individuals delving deeply into cyberspace.

Times have changed. Today, IP, while not quite as common an acronym as PC, is clearly working its way into the mainstream lexicon. From wildly popular services like VoIP (voice over IP) to fast emerging businesses like television over IP (hawked as IPTV by your local phone company), IP is beginning to penetrate the public consciousness as a key enabling technology for a wide range of digital consumer applications, including entertainment, communications, and high speed broadband Internet access.

Why the sudden frenzy? The truth is, it's not so sudden. Momentum for IP-based technologies has been building steadily for a long time and on a global level. Developed as a rule set for data communications on the Internet, IP technology was originally conceived for use in academia and government, and later moved into the corporate office. Ethernet and Internet Protocol, as open standards for networking and communications, gained a worldwide following in the technical community and became de facto standards for networks large and small.

As digital convergence took root in the ‘90s and technologies like video and communications began migrating from analog to digital (finally!), Ethernet and IP became practical for carrying any content that could be converted into a digital code – which is to say, just about anything: language, graphics, sound, video, etc. As computers and networks became more powerful and achieved blazing data transmission speeds, it became practical to consider using IP for interactive, on-demand, and

streaming applications on a very large scale. The applications arose, first again, in academic, government, and business arenas, but spread relatively quickly into the consumer domain, aided by the increased residential availability of broadband Internet access (faster the 128K).

Fast forward to the present. Today, the final frontier for Ethernet and IP is the home. All commercial and public networks are digitally based and most operate using IP as a data transmission protocol. Cable TV and phone companies are racing to bring IP-based services, providing TV, telephone, and broadband Internet access to tens of millions of customers.

And while home-based Ethernet-based data networks have become more common, many homes haven't wed their communications or entertainment systems with their computer network. Most use Internet access for web surfing and messaging. The so-called legacy household products (your phone, analog TV, audio systems, heating & AC, and security systems), even if they employ digital technology, weren't made to "plug 'n play" on a digital network and operate as isolated systems in the home.

The development of clever interfaces, such as those used by Vonage and other VoIP services, was a first step for many consumers to realize the benefits of using a digital network for something other than basic computing and Internet access. Suddenly, it became possible to have the full slate of premium phone services – caller ID, call waiting, 3-way calling, voice mail, etc. – plus long distance throughout North America, all for less than someone was likely to pay to get conventional basic service and local calling.

Imagine a true digital home where an Ethernet backbone carries all kinds of content and control information (multi-room entertainment, hi-def video, automation, security, online gaming, etc.). Imagine changing the thermostat, adjusting room lighting, or even ordering take out with the same touch screen or remote you use to play music or watch TV. Imagine using your PDA on vacation to program your Tivo or watch a real-time video feed from security cameras around your home. Until recently, these capabilities were only possible with very expensive proprietary systems requiring extensive custom programming.

IP is leveling the playing field and removing barriers to make these products and capabilities practical and affordable to significantly greater numbers of people. Delivering entertainment over IP in a home or commercial system does pose some unique and difficult challenges, since there is a need for precise synchronization – making sure all signals play simultaneously in every room or zone – that doesn't exist in other network applications. (For example, two people in different homes wouldn't know or care if the streaming live concert they were hearing reached their homes several seconds apart; however, if streaming music reached two adjacent rooms even 1/100 of a second apart, the gap would be quite audible and very displeasing). Fortunately, advancements such as the patent-pending StreamNet™ technology developed by our company NetStreams, has solved this dilemma – automatically synchronizing audio so that the maximum delay between any two rooms is 1/1000 of a second apart!.

As readers of this site will know, there are some significant technology companies, such as Microsoft, HP, Intel, and Cisco, now creating IP-based products for entertainment, communications, and home control over a digital IP-based network architecture (whether it's Ethernet over CAT5 and WiFi, HPNA over twisted pair, or MoCA over coax). Though none of these companies has yet developed (or licensed) a technology like StreamNet to provide the system synchronization customers expect and demand, their dedication to digital technology - not to mention the muscle they can put behind product development and marketing – can only help hasten the arrival of a time when homes and buildings of all types run all systems over an IP-based network.

However, as the rest of the industry races to embrace the IP-based network architecture, NetStreams is leading the way now with products that not only distribute content over IP networks,

but also controls that content – be it audio or video -- as well.

According to several recent independent studies, the presence of digital networks in the home will grow significantly in the next few years, not only in new construction but in existing homes as well. One key reason behind this will be the simple fact that as the world outside the home becomes increasingly reliant on digital IP-based networks, the benefits to having IP inside the home will become too great, and too attractive, to ignore.

Herman Cárdenas is the founder and CEO of NetStreams LLC, a global leader in networked entertainment systems based on Internet protocol (IP) technology. Arising out of the SMART Home Initiative, a joint venture between GE and Microsoft, NetStreams is developing the future of high definition audio and video distribution over TCP/IP, offering home entertainment products that are truly user-friendly and future-compatible.