

Next Generation Internet

A Vision of the Future



We are on the verge of a major transformation in the way humanity engages the world.

Like the telephone, radio, television and the first internet, the next generation of the Internet will bring with it such monumental changes in the way the world works that society will again be transformed irreversibly.

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The Next Generation Internet that will emerge over the next two decades will be defined by ubiquitous low cost high speed fiber Lightpath connectivity for all households and businesses.

The unique nature of high speed Lightpath connections enables a new world of true real time collaboration with rich media. The Lightpath network enables deterministic connections to anyone in the world. Stated another way, once you are connected, the time it takes to send data, the 'delay', from **point a** to **point b** is fixed and never changes and just as important that delay is very small and the connection is completely reliable.

At first glance the significance of this may seem too 'simple' to be earth changing, but it is the simple concepts that are often most transformative. As you begin to think about this more deeply an endless number of possibilities become apparent that are completely unrealizable with today's highly reliable TCP based network.

The fundamental genius of the current internet is its biggest limitation. It has so much redundancy and reliability that it cannot guarantee consistency and predictability in the transfer of information and hence is incapable of supporting a real time information and media intensive environment. Unfortunately this is where the world and society want to go. The Lightpath Network - the **National Public Lightpath** and eventually other peered networks will enable these new possibilities. These new networks will allow society to move in the direction it wants and must go.

What is remarkable about this transformation is that the current TCP/IP based network infrastructure will not go away. It will continue to evolve and expand in its role as the network for uses that are not real time critical. Both networks will exist transparently providing the best of both worlds. Over time traffic on both networks will continue to grow but there will be a fundamental shift in the volume of traffic from the current internet to the Next Generation Internet as more and more traffic is used for real time transactions.

Imagine the ability to easily connect to anyone in the world and work as if you are in the same location, together solving problems and interacting in such an immediate and information rich manner that is no longer merely an interaction but rather a *collaboration* in real time.

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What if educators could truly have global collaborative classrooms in realtime that look and feel real. Educators are actively pursuing solutions for remote teaching. Current solutions, using the existing internet, fall short of a complete solution. A real time collaborative network - a Lightpath Network is required to truly create a remote distributed teaching environment.

Imagine film and television production working across distances in immediate high definition collaboration with directors, editors, effects and on location. The demand for this exists now. This alone will allow production facilities to remain in their current locations.

Imagine new multiplayer games and game engines that allow players to exchange all forms of rich media and information between each other in real time as part of the game. This will radically change the design and fundamentals of games. Gaming will be reinvigorated and turned up side down. The economic opportunities of this alone are staggering.

☀ The demand for this exists now.

What if all your data, information, media are immediately accessible from anywhere in the world and can be shared and interchanged with anyone else. With the development of rich collaborative tools for the Next Generation Internet there will be an unlimited number of new applications and economic opportunities in the non-profit, business and consumer worlds.

The Next Generation Internet is not simply a change in the medium, it is a new medium. The Lightpath is the message. It is the new medium that will dramatically change the way we live, play and work. It is the message, just like the mediums of television and the web have been the messages that have dramatically changed the lives of all humans.

Other countries are attempting to move rapidly to develop similar network infrastructures. The country, state and regional economies that realize the enormous transformative effects of the Next Generation Internet and move quickly will realize enormous economic benefit just as we have seen with the expansion of the web.

☀ The Lightpath is the message.

Users organically drive products and infrastructure to match the capabilities, play-flow and workflow they want. Humans are social beings and

the burgeoning of interactive websites, *You Tube*, *SecondLife*, *Warcraft* to name a few, is just the early indicator of what people are really looking for - they want high quality ubiquitous real time collaboration with other humans, not just partial-time low quality interaction.

Some early real time collaborative products are just beginning to become available in the 'Fortune 500' market called 'Telepresence'. These are great examples of creating products to fill a niche based on new infrastructure and designed to drive new technology. Unfortunately as is the nature of these very early endeavors they are very expensive and are only accessible to the highest end clients.

Not to despair. This is consistent with technology development timelines. Take digital video and film editing for example. Just 15 years ago only a small number of production facilities could afford these technologies and hence only a small number of high end clients (feature films) could afford to have access to this technology. Now, due to advances in software, technology and infrastructure anyone with a desire can create a digital film. Digital film making is now accessible - the entry fee is affordable, it is easy to use and the infrastructure of companies developing equipment/software that matches the needs and wants of the customers is mature.

This same timeline is also the future of the collaborative Next Generation Internet. The early adopters will come from the creative disciplines digital media, public media, education, medical, gaming, architecture and other creative design disciplines where distance interaction is already in place but completely lacks the ability to do true collaboration in real time with the accessibility, quality, bandwidth and performance that creates a true working collaborative environment.

The acceleration of the organic process of enabling this new medium is what INGI and the National Public Lightpath (NPL) are all about.

The National Public Lightpath has a unique opportunity to be the early driver of the development of not only the infrastructure but also the tools, intellectual property and the public accessibility for the Next Generation Internet. By creating the first true public version of the Lightpath Network and driving its use through the needs of Public Broadcasting, education, social support and public knowledge sharing, we will rapidly move past the early adopter phase and enter the inevitable future of a truly connected world.

☀ National Public Lightpath