

Safely Riding the Internet Highway

Learning how to drive the internet highway on the path to the Smart Home means rules, regulations and laws.

By Cees Links, CEO GreenPeak Technologies

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Compared to most of the world's infrastructure, it is amazing how primitive and lawless the internet really is. Yes, the web is technically sophisticated but when trying to understand how it should be used and how it can benefit our lives, it is still a wild and unruly path, needing a great deal of growth and maturing.

When compared to our highway system – the learned knowledge of how we should travel on the internet highway, relatively, we are still in the horse and buggy days.

The world has experienced motor vehicles for about 100 years – compared to just only 20 years for web travel. It makes sense that highway users are more sophisticated and knowledgeable about how to travel the asphalt and metal highway compared to the digital highways in the cloud.

To be efficient, useful and safe, societies worldwide have developed customs, rules and regulations to ensure that we don't get run over and injured as we travel from one location to another. It makes sense that the same kinds of rules and customs should apply to traveling the internet – especially from a privacy and security perspective. Those using the web need to learn the rules of the road. What not to do and where not to go.

When I say learn I do not mean to simply learn how to browse the internet – what I mean is the collective education that we need to comprehend the concept of the internet, just as we learned a lot in the last 200 years about the concept of the car. Although the car may have gradually developed from a traditional horse pulled carriage, today there is very little that resembles its origins. The same will occur with today's internet. In 20 years from now, traveling the web will be a lot different than it is today.

Although the first primitive "auto-mobiles" appeared maybe a couple hundred years ago, the real acceleration of car technologies occurred about 125 years ago. This development changed the way we live our lives today. Not only did it create a complex and worldwide automotive manufacturing industry, but it also gave birth to a cornucopia of associated industries and infrastructures. For example:

1. **Infrastructure.** To service the world of the car, today we have major transcontinental highways, bridges that cross major rivers and seas, tunnels that go under water and through mountains, etc. We can travel around large portions of the world with our cars and without much worry. This infrastructure includes highway signs, advertising billboards, truck stops, motels and many other industries that have evolved to service the needs of the driver.
2. **Suppliers.** Of course, we cannot forget the petrochemical industry. Without the need for fuel to power our vehicles, the oil industry as we know it today would not exist. This includes gasoline stations on nearly every highway exit, fuel shipping fleets and noisy, dirty refinery complexes to convert crude into fuel, as well as entire nation-states that only owe their financial existence to the need for gasoline to power our cars.
3. **Legislation.** Although somewhat different from country to country (for instance what is the 'right side' on the road to drive on), largely around the world there is a consistent set of rules that have been developed on how to safely drive and operate a car.

4. **Enforcement.** With all the rules put in place there is also a mechanism for compliance and rule enforcing, embedded in the larger legal structure of a country – including traffic police, or getting a speeding ticket.
5. **Training.** Although also different from country to country, it is common that someone needs to go through driving lessons and an exam to obtain a license for driving, before legally allowed to drive – and in today’s traffic, for sure these lessons are helpful!
6. **Insurance.** With the increase in the speed of the cars in most countries it is now required to have a liability insurance to drive a car. A large insurance industry has been built up around this, including discounts for safe driving, etc.
7. **A “standardized” Operator interface.** Isn’t it wonderful that a traveler can fly from one country to another – visiting a place he or she has never set foot in, and be able to rent a vehicle at the airport and then be able to safely drive it around that destination? The operating interface for cars has become relatively standard. A steering wheel, accelerator, brakes – no matter what kind of car you rent, compact to luxury, and no matter where you drive, you can usually operate the car without having to take a training class or hire a consultant.

The concept of ‘driving’ is a complete fabric that has evolved from the basic concept of a car. Besides individually learning how to drive a car, as a society we have developed a complete concept of driving that must be astounding to drivers in the previous centuries.

Now let us compare this highway and driving evolution to the experience of traveling on the internet highway.



There are many signposts on the internet highway that need to be learned and mastered. It is easy to get lost, easy to get into a serious accident where your personal data is stolen and compromised.

Although the internet has come a long way, it is clear that the fabric of the internet highway is still very immature, and everyone who is getting on the internet is doing so very much at his or her own risk.

While the infrastructure is rapidly building, reaching into all the small corners of the world, the responsibility of getting on the internet is still very much with the individual users, without clear rules or legislation around basic principles of security and privacy. People buy a software package for security

against computer viruses, more or less as a sort of insurance premium – without any assurance that this will fully protect them. Many people use a smart phone to access to the web – with very little protections against a rapidly growing assortment of attack vectors.

Because of the open character of the internet the lack of security goes even a step further. Governments that are supposed to set the traffic rules on the internet are often the biggest culprits in exploiting the lack of rules to their own advantages. Under the flag of fighting terrorism and crime, many governments seem to take maximum advantage of the lack of rules and the lack of understanding.

For instance, take the concept of a ‘search warrant’ that comes surrounded by an explicit set of rules. However, in many parts of the world, this is not applicable for the internet. Governments can intercept and inspect your computer and your web communications without you even noticing. Mail confidentiality? It exists in the physical world, and has even anchored in the law of many countries. But email confidentiality does not exist: Google’s gmail comes for free, but it costs something!

In the “real” world, “the people” have come a long way protecting themselves against an overzealous government while in the virtual world of the internet, governments and parliaments are still learning to understand the concept of the internet, and whether existing legislation around security and privacy is adequate.

A second area of total confusion is around the privacy and ownership of personal data. Large companies develop appealing applications that people can use for free (Google, Facebook, Twitter, etc.), but by downloading, installing and using them, people explicitly give their privacy away. Have you ever read the small print (the EULA – End User License Agreement) that comes with an application before you download it onto your phone? Most applications – especially useful free apps – collect a great deal about the user’s life – where they are and when, who they contact, what sites they research and visit – in order to package this data and resell it to advertisers.



Security, privacy and personal data confidentiality are critical issues for those surfing the internet – especially for children and teens. These rules are constantly changing and shifting as technology continues to evolve.

Even a step further, as many parents of adolescents know, application and game builders hook children to buy on-line gimmicks that are part of a game (bags of jewels, power weapons, etc.), racking up bills in the thousands of dollars, as a modern version of exploiting naïve game addiction. Children are not the only victims. Most “free” online games only survive by hooking their players into buying shortcuts and add-ons. Others can be victimized by phishing emails, exploiting people’s greed, curiosity and simple lack of knowledge about internet scams.

The internet can be a dangerous and costly place, where people unknowingly expose themselves in the virtual world in a way that bad guys can come after them in the physical world, opening themselves up for extortion or eventually leading to suicide.

I think a good first step would be to develop classes for school children that explains to them not only how to correctly use the internet to find out what they need to know, but also how to protect themselves from the obvious dangers from criminals and spamsters, as well as from the subtle prying eyes of advertisers and governments. Right now, many of those in the tech community are aware of these threats and try to teach our children, family and friends how to protect themselves. However, most end users have no idea of the traps and pitfalls that lurk on the highway – the potential life destroying dangers that await them if they don’t know how to steer around them.

With the emerging Internet of Things the amount of devices on the internet will increase exponentially with dozens, if not hundreds of devices in every home feeding valuable personal data onto the web. With data analytics software becoming more powerful and ubiquitous, both the usefulness as well as the capability for abuse will increase as well: the stakes are just getting higher, at both sides.

There is not a simple solution. The internet is a great place to be, but at the same time it is full of dangers. The internet is the world greatest information tool but we need to learn how to use it carefully so that we do not end up injuring ourselves, our families and cultures.

As a society, we have to invest in understanding these dangers and learning how to address them. This will not come for free, just like our cars and roads did not come for free. We will have to build a fabric around the internet that includes legislation, enforcement and training. Technology is complex, and there still is a lot of ongoing development around the internet. With this constant change and evolution, this is not a stable situation, where rules can be easily developed and maintained...

But we have no choice, there is a lot at stake going to the fundamentals of the society as we have built today. Libert ,  galit  and fraternit , the foundations that our democracies have been built on, do not come for free – they were hard fought, and we need to keep on fighting to avoid them being washed away over the internet in a pool of ignorance, lack of interest of a government “that knows all”.

There is reason for optimism. Today, driving may still be a dangerous thing, but it is now safer than it was ever before. Development of common sense rules, standards and infrastructure took a while – and so it will be with driving on the internet freeway. That is - if we put the right efforts and resources into it!

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About Cees Links

Cees [“case”] Links is a pioneer of the wireless data industry, a visionary leader bringing the world of mobile computing and continuous networking together. Under his responsibility, the first wireless LANs were developed which ultimately became house-hold technology integrated into the PCs and notebooks we are all familiar with. He also pioneered the development of access points, home networking routers and hotspot base stations, all widely used today.

Cees started his career at NCR Computers where he was responsible for the development and launch of the world’s first wireless LAN product in 1990, a major innovation at that time. Throughout several acquisitions and divestitures (NCT, AT&T, Lucent Technologies and Agere Systems), Cees continued his work in the wireless LAN area, which he turned into a multi-hundreds million dollar business for Agere Systems. He directly closed a deal with Apple Computer in 1999 that ignited the growth of the wireless LAN industry. Through this deal, wireless LANs went on to become a standard notebook feature.

Cees was involved in the establishment of the IEEE 802.11 standardization committee and the Wi-Fi Alliance. He was also instrumental in helping to establish the IEEE 802.15 standardization committee to become the basis for the ZigBee sense and control networking technology and standardization.

About GreenPeak Technologies

GreenPeak Technologies is an award winning fabless semiconductor/system company and the world recognized leader in the IEEE 802.15.4 and ZigBee market with a rich offering of semiconductor products and software technologies for Smart Home data communications and the Internet of Things. The GreenPeak founders have significantly contributed to the invention of WiFi and made it into a commercial success used by several billion people today. GreenPeak is recognized as a leader in developing new wireless technologies for consumer electronics and Smart Home applications, demonstrating rapid growth and adoption by major customers.

GreenPeak is privately funded. It is headquartered in Utrecht, The Netherlands and has offices in Belgium, China, France, USA and Korea.

For more information, please visit www.greenpeak.com.