The Network

The Network

by Jim Lengel, November, 2009
jim@lengel.net

The Human Network

The guru to Katmandu by half-past two

surviving collaboration

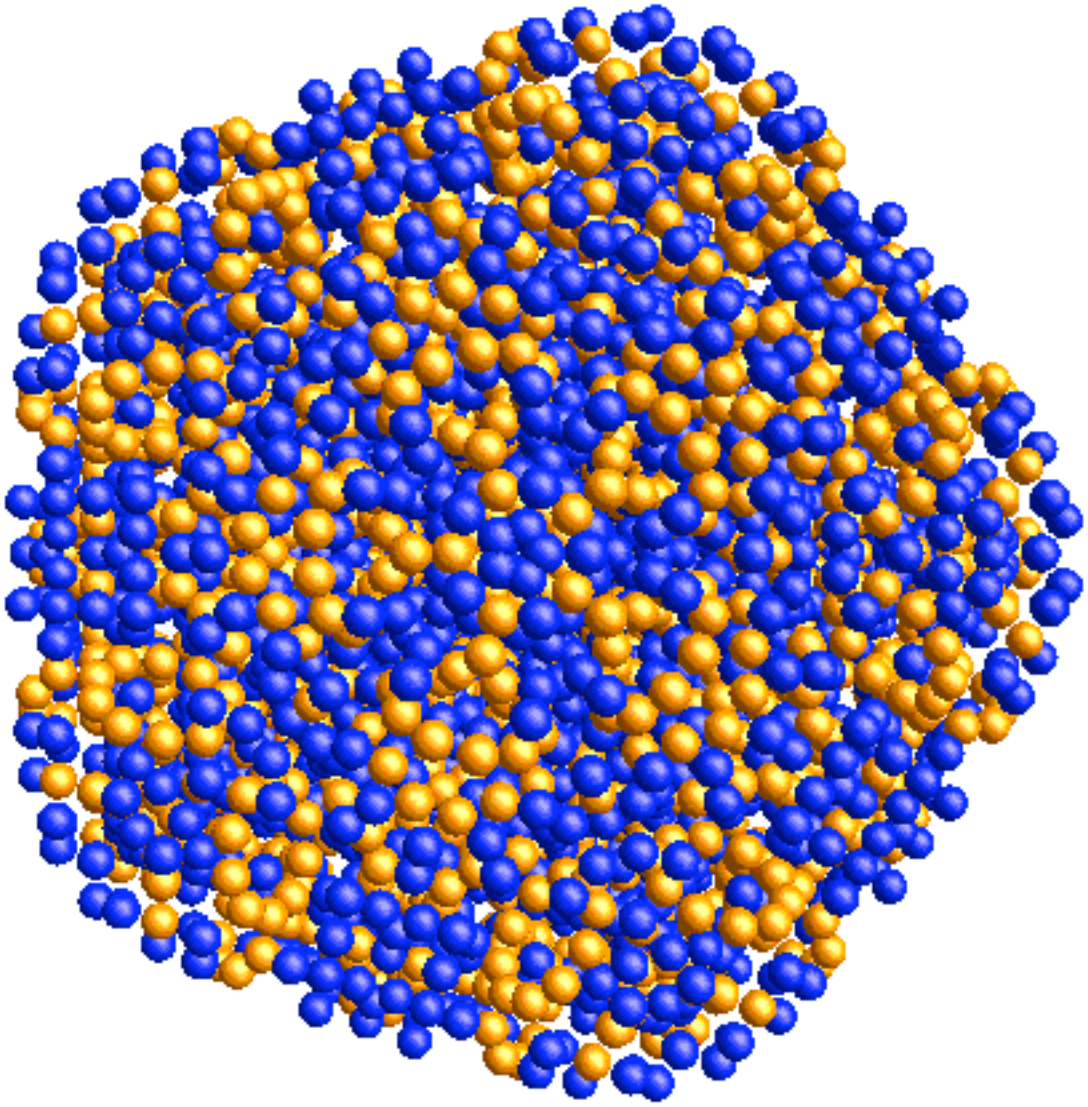
shortest international commute

opening of China

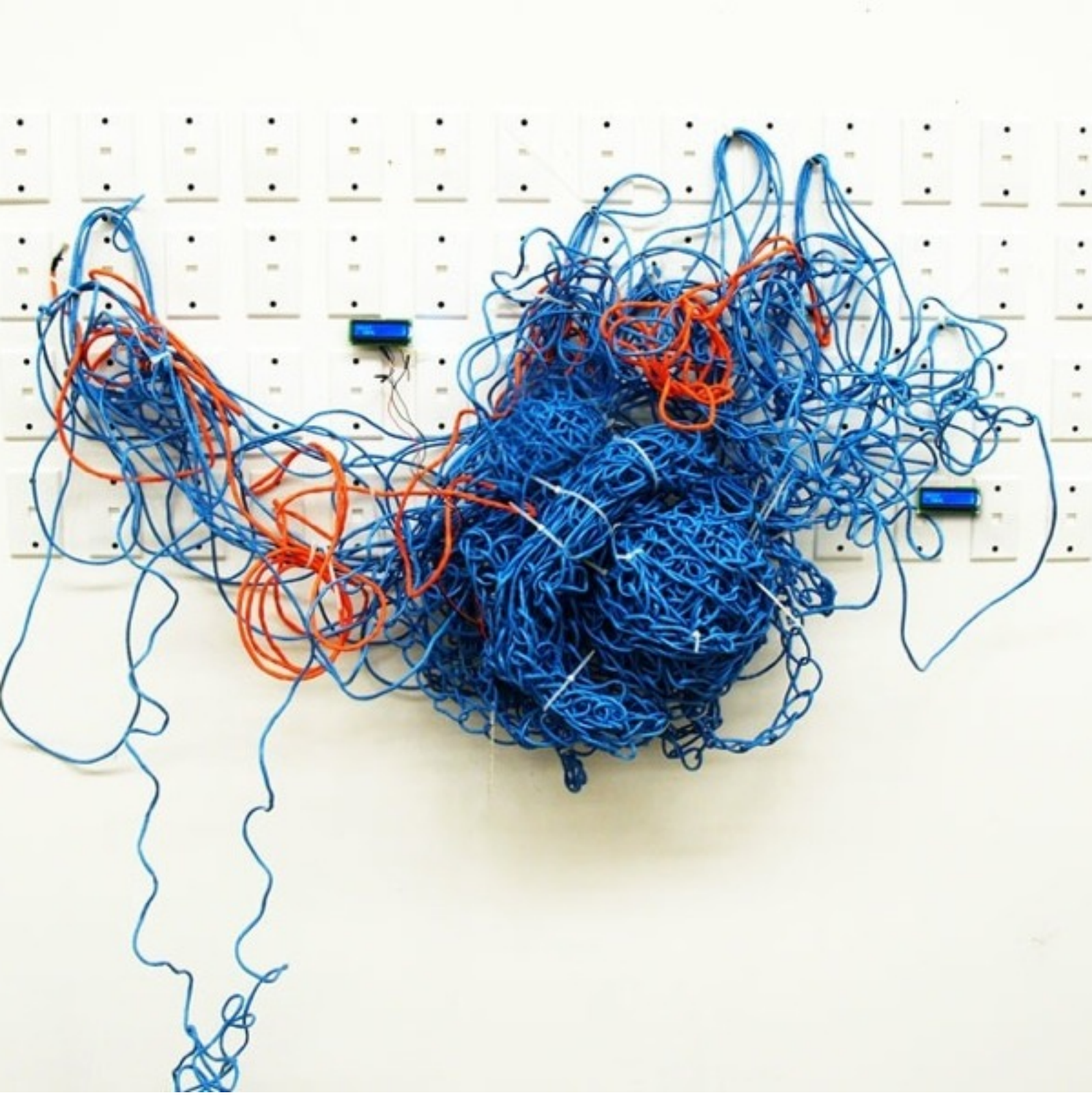
soccer around the world

The lives we lead and the work we do in a 21st-century school or business or home would not be possible without the network. You've seen the ads on TV: The guru to Katmandu by half-past two, surviving collaboration, the shortest international commute, the opening of China, or soccer around the world. The network is the great enabler, the deliverer of possibilities, the basic infrastructure that lets us and our ideas flow across the planet.

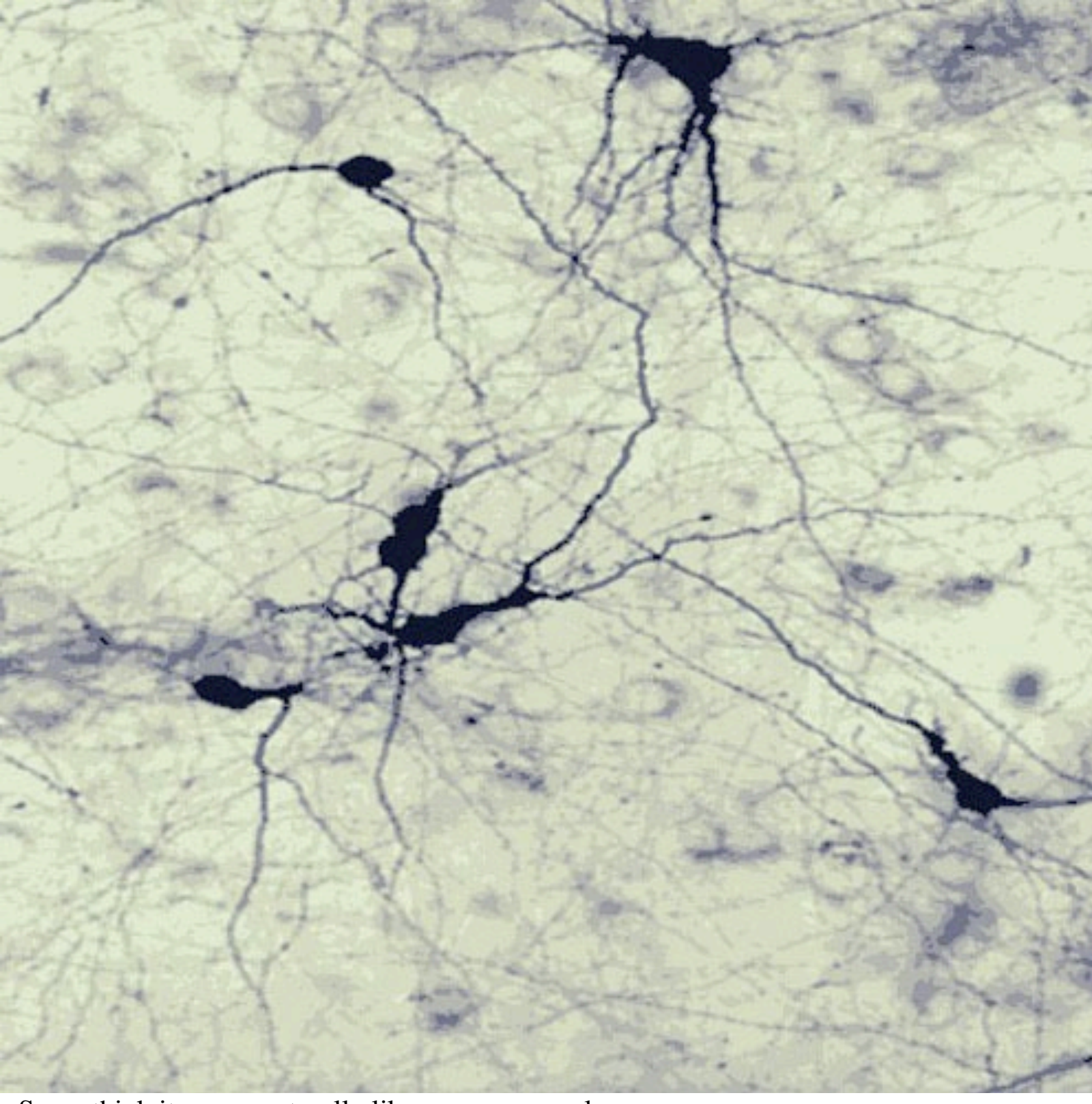
We can't see the network, though we use it every day. We can imagine it, though. It's a rabbit warren of paths and tunnels under us all leading everywhere.



It's a lattice or a matrix or a mesh or a grid putting the whole world on a coordinate plane.



When it doesn't work for us it's a disorderly tangle, a complex, or a maze.



Some think it grows naturally like a nexus or a plexus or a web.

Digital networks didn't exist when I went to school, but today no school could survive long without one.

But not all networks are created equal. The network that enabled the guru to be in many places at once, or the global soccer players to exchange moves on their iPods, required some careful planning and execution. This presentation looks at the characteristics of a useful network -- one that human beings can use to make the world a better place.

Robust

Flexible

Open

Secure

Standards

Wireless

Not just any network

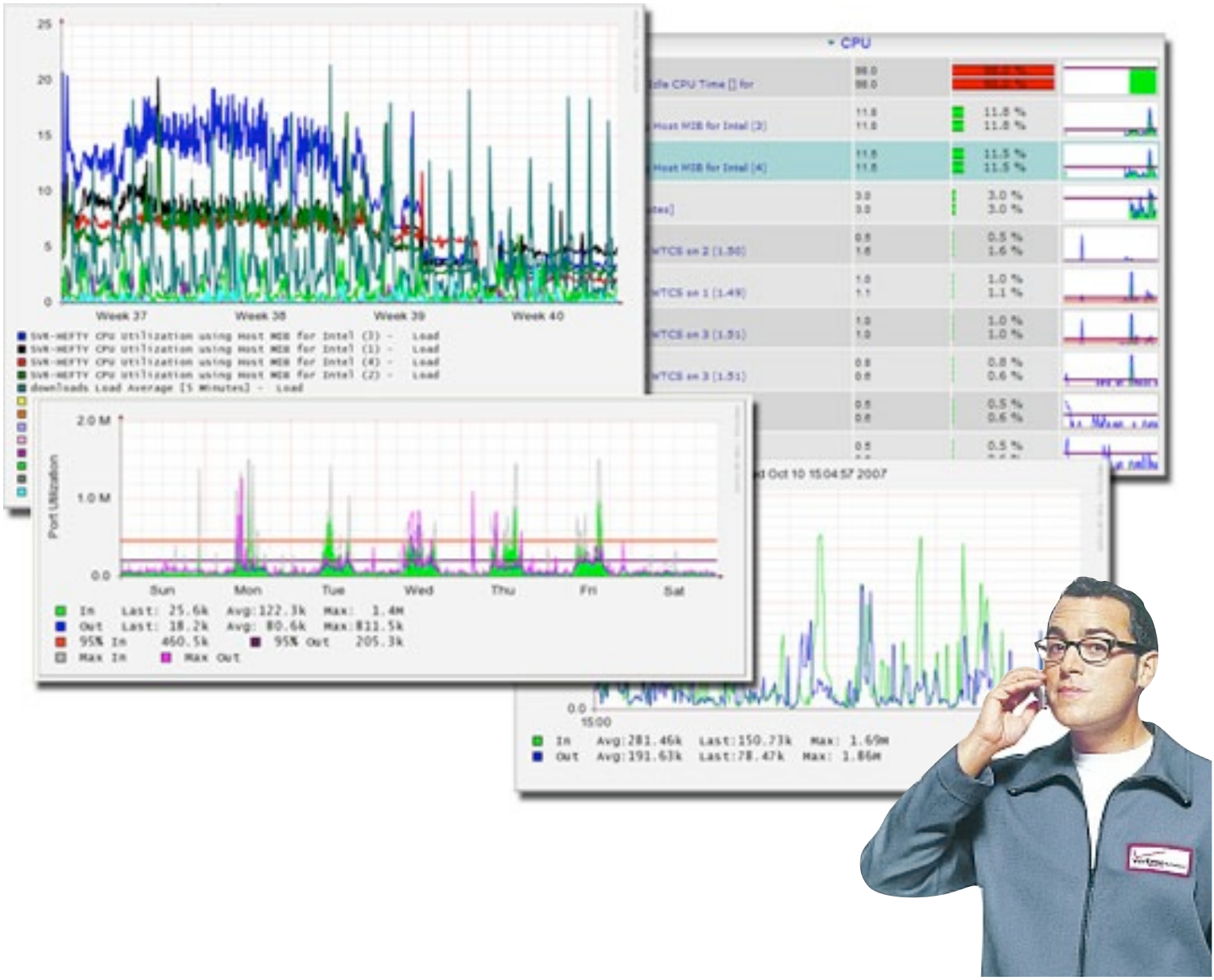
The networks that enabled the people pictured in the videos to get their work done shared some key characteristics. They were robust, reliable, flexible, open and secure. They followed commonly accepted open standards, and they allowed many types of devices to connect, using wires or not. Let's take a closer look at each of these traits.

Robust

Robust

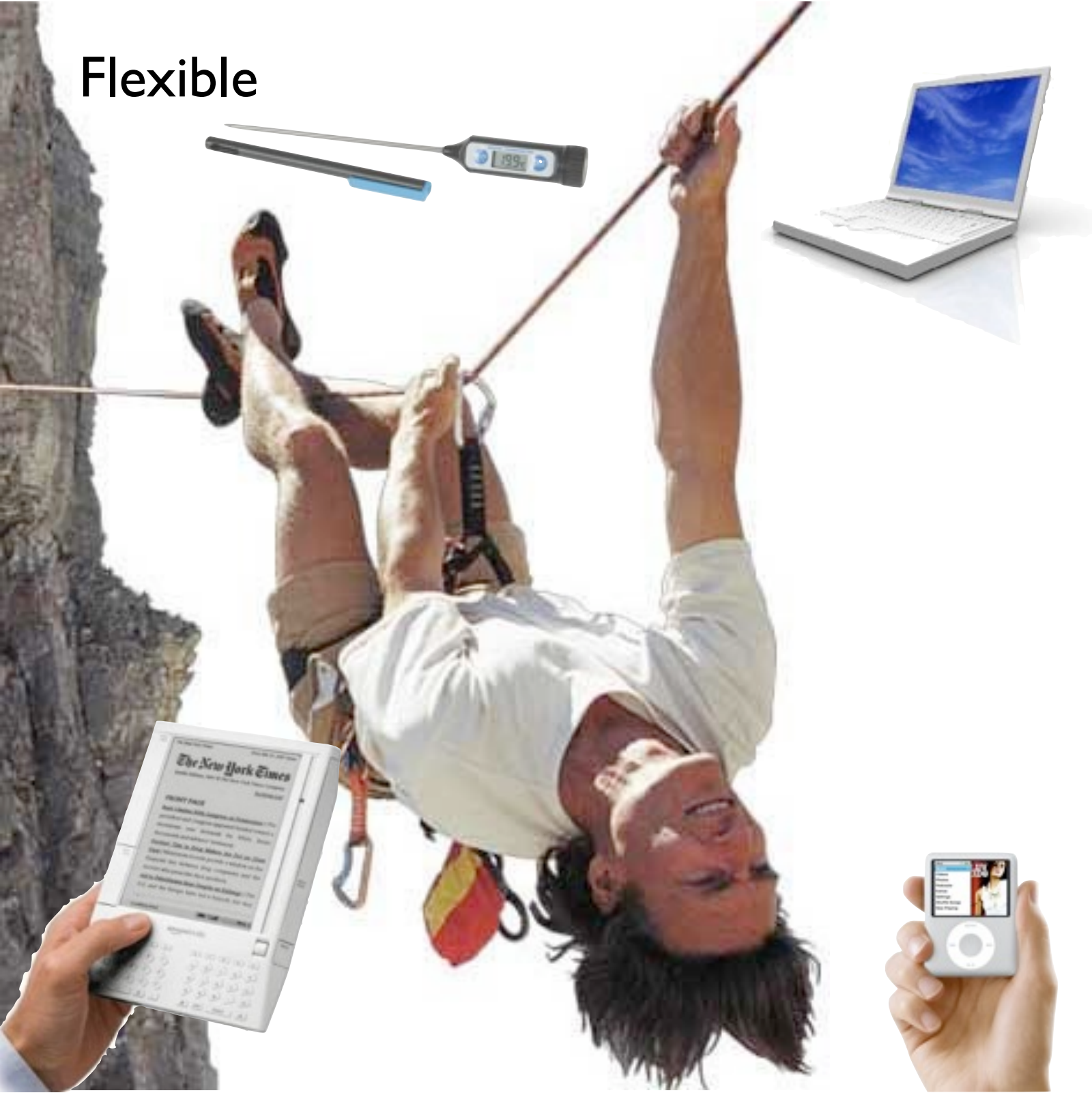
The network needs to be strong enough to support what its users want to do. And these days, that means video, teleconferencing, and live meetings. A traditional network designed to pass spreadsheets from one desk to another will not suffice or survive in the world pictured in those clips. The new network provides plenty of bandwidth, fast and unobtrusive routing of information to the right places, and a solid connection to the global backbone that connects us all. This essential strength provides the foundation for the services that follow.

Reliable



Reliable

A network that goes down does not help its users move up. A useful network is designed with redundancies, backups, and alarms that prevent down time. Competent people take responsibility to keep things running 24 hours a day, seven days a week, and are on call when users experience difficulty. The organization monitors response time, down time, and network performance, and reports these frequently to its leadership and to its users. The digital information network is as important to the school as running water or electric power.



Flexible

The network mangers seek out information on new network protocols, devices, and services that might be of use to its users, and frequently modify the network to enable their use. The network allows devices, protocols, and services from a wide array of vendors and manufacturers to be connected and use its services.

Adaptable

Like a successful species in a changing environment, the network adapts to the new developments in the world of information technologies.

Decentralized

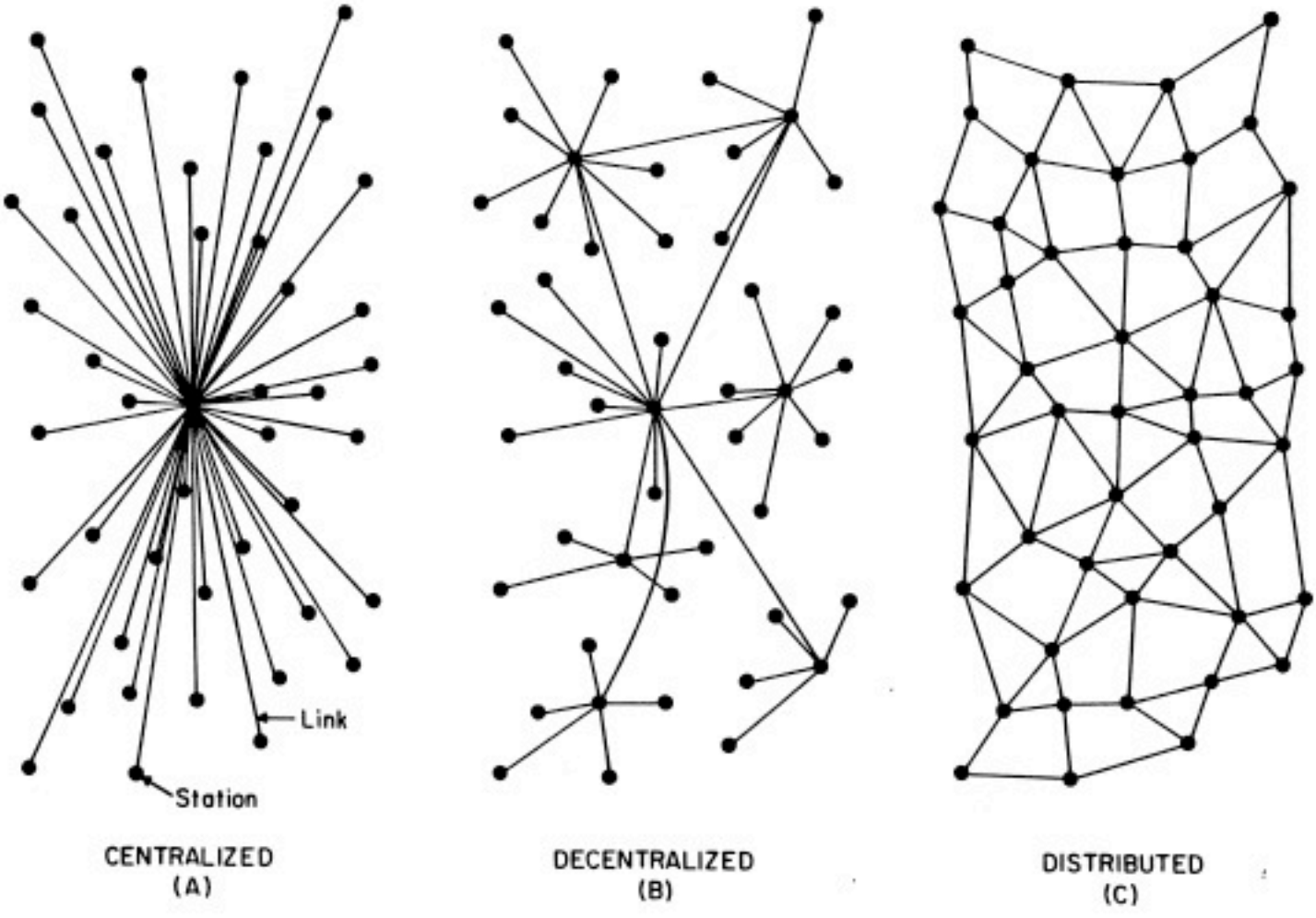


FIG. 1 — Centralized, Decentralized and Distributed Networks

And it follows the basic internet design principle of *decentralization*, so that a fault in one node or device does not bring the entire system to its knees.

Open

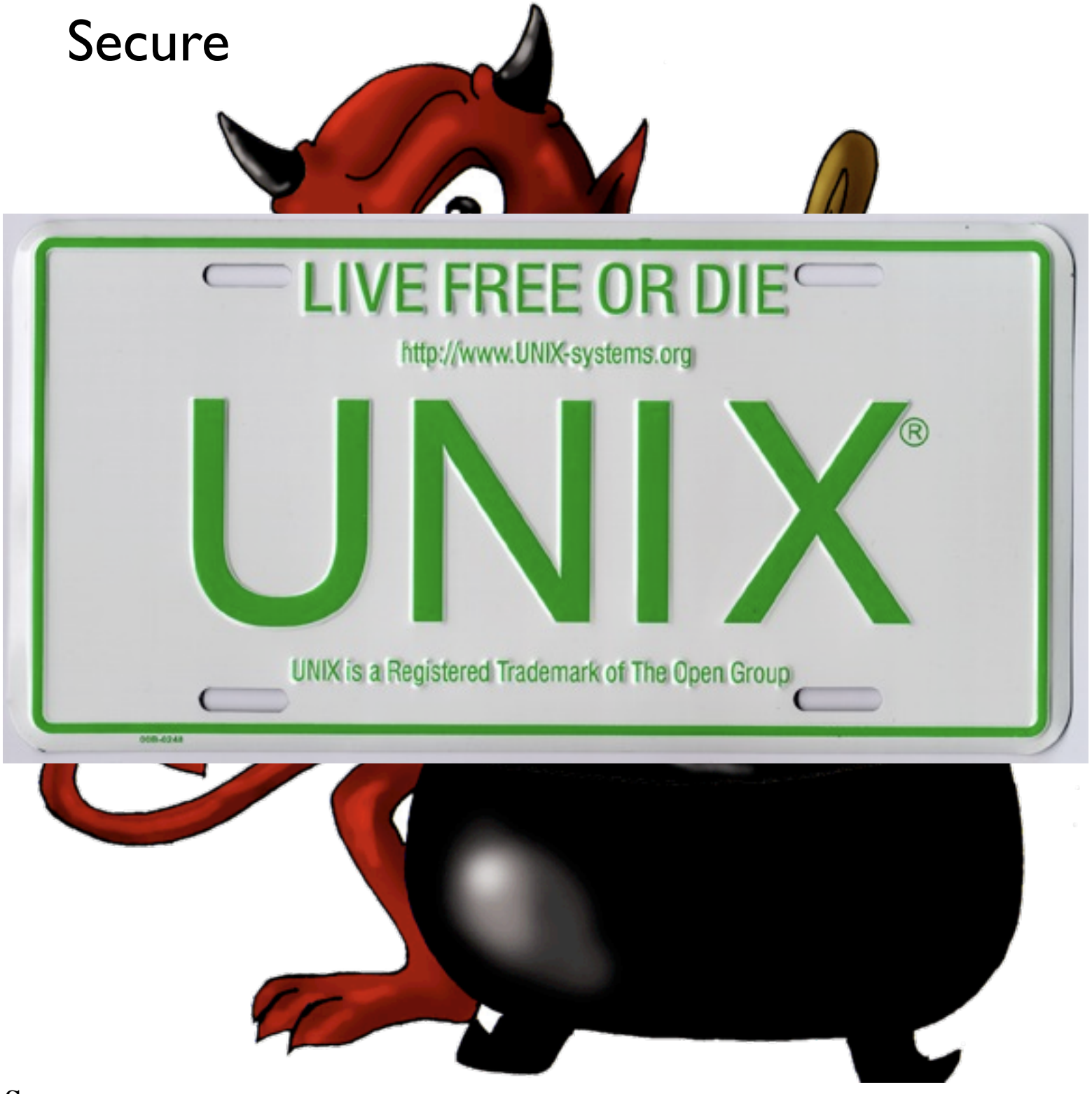
The network is designed to serve many purposes, traditional, present-day, and futuristic. It does not restrict the way its people use the network, except where safety or security is at risk. Network policies are set not to reduce the work of the network administrators, but to enhance the work of the teachers and students who use it. A useful network is a big tent, and welcomes all kinds of camels to nose around under it.

Standards-based

Standards-based

A useful network follows common standards agreed to by respected international organizations such as the Institute of Electrical and Electronics Engineers, the International Organization for Standardization, the Moving Picture Experts Group, the World-Wide Web Consortium. The internet is a world-wide resource, designed by its users through democratic deliberation; the standards for information exchange developed by these non-profit, collaborative groups -- public and open to all users -- enable more useful networks than those built on secret proprietary protocols closed to other vendors.

Secure



Secure

Openness aside, evil exists in our world. A useful network is set up to prevent evildoers from disabling the network or stealing the private information of its users. Interestingly, the least secure networks are often those based on proprietary systems: most of the viruses and hackers that we hear so much about exploit flaws in those secret schemes. Standards-based networks enjoy a wider array of security tools and experience far fewer evil disruptions.

Wired and -less

Wired and -less

At least half the devices you saw in the video vignettes connected to the network by radio, not by cables. The smaller and more useful the device, the more likely it uses a wireless connection. The mobility that teachers and students need as they go about their work demands full open wireless access for all kinds of devices, as well as secure connections to the school network from home, such as that provided by a Virtual Private Network.

Robust	.....	Frail
Reliable	.....	Untrustworthy
Flexible	.....	Rigid
Open	.....	Closed
Secure	.....	Proprietary
Standards-based	.....	Vulnerable
Wired and -less	.....	Inaccessible
Enabling	.....	Restrictive

Conclusion

You may not need to be in Katmandu by 2, and you may not have shared a video clip with a colleague in China in quite a while. But you do need a solid, reliable, flexible and open network in order to get your work done. And so do your students. How does your school's network stack up against the characteristics described above? How would you place it along these continua?