

4 reasons Cisco's IoT forecast is right, and 2 why it's wrong

By [Steven Max Patterson](#), Network World | APR 5, 2017

Long-term IoT skeptic and IEEE Consumer Electronics Magazine Editor Peter Corcoran has become more optimistic about IoT.

Peter Corcoran, Ph.D., who describes himself as long-term IoT skeptic, published a research paper recently on arXiv.org—[Third time is the charm – Why the World just might be ready for the Internet of Things this time around](#) (pdf)—in which he speculates that this incarnation of the Internet of Things (IoT) may succeed.

Technologies often fail on introduction, later to reemerge and become widely adopted. The PC, smartphone and tablet all went through at least one of these cycles.

In the early 1990s, the Consumer Electronics Association first tried to promote CEBus, a specification for interconnecting devices in the home that supported multiple physical layers, including twisted pair, coaxial cable, powerline, wireless and even RF. CEBus was too early.

In the early 2000s the IEEE and Corcoran re-ignited the IoT discussion because internet connectivity became widely adopted after the dot.com boom and component costs had dropped dramatically, notably Ethernet components, and enabling software technology such as embedded Java emerged. Again the IoT fire burned then died.

In 2011, [Cisco sparked renewed interest in IoT](#) when it first forecasted that 50 billion devices would connect to the internet by 2020. Perhaps Cisco's forecast was a bit ambitious. [ABI Research targets](#) are a bit lower, at 21 billion, and a bit later—2022.

Forecasting the future is not easy. But if Corcoran's change in outlook and ABI Research is correct, the three-decade wait for IoT might be over.

4 reasons IoT will meet Cisco's forecast of 50 billion IoT devices

What moved one of the world's foremost IoT skeptics to be at least marginally optimistic? The smartphone and cloud computing are the two major reasons that Corcoran cites, but there are more.

1. Cloud success: The cloud has evolved a set of sophisticated infrastructures for storage, messaging, security and content connectivity. Facebook, YouTube, Dropbox,

Google Drive, Spotify and other cloud services have led consumers to accept cloud-connected devices as a normal course of their lives, paving the way for cloud-connected IoT devices.

2. Ubiquitous mobile networks: Mobile networks have driven ubiquitous connectivity. It is rare when a consumer does not have both cellular data and Wi-Fi connectivity. It has become an expectation of consumers, app developers and manufacturers. Almost everywhere where an IoT device could be installed (in homes or businesses) has internet connectivity.

3. Smartphone adoption: Smartphones provide the user interface and a gateway for some devices to access, manage and control our IoT devices. Entertainment systems, heating and cooling devices, electrical and lighting control devices, access and security devices, and personal assistants are set up and controlled with smartphones.

4. TCP-IP: More so than ever, the internet makes this new infrastructure accessible everywhere. It is genuinely ubiquitous. Except for low speed, low-cost networking protocols such as Zigbee and Z-Wave, TCP-IP almost has a consumer communications monopoly. Non-TCP-IP protocols gateway to it.

2 reasons why IoT will not meet Cisco's forecast

There are two reasons that IoT forecasts will not be met: one obvious, one less so.

1. IoT privacy and security: Many IoT security exploits have been reported, not the least of which being the [Dyn denial of service attack](#), which was made possible by conscripting many poorly secured IoT security cameras. The NEST thermostat has been exploited to determine if the homeowner is at home, as have baby monitor cameras and un-encrypted video data. Also, many IoT devices ship with default login names and passwords that are not changed by the consumer. Though consumer associations and manufacturers are working on better and comprehensive security methods, none has become an industry standard and many are not yet complete.

2. Energy: The consumption of energy by consumer electronic information communications technology (CE-ICT) grows by about 7 percent per year, according to Corcoran. This growth only includes TVs and entertainment devices, computers, smartphones and tablets. It does not consider that all these devices are cloud-connected. The energy cost of powering data centers and networks grows proportionately with the increase in network and cloud usage. The data load on networks has grown at 22 percent per year, [according to Cisco](#), and cloud data centers are growing by about 15 percent, according to [Telecompetitor](#).

IoT devices are expected to be low-power devices, but the number of IoT devices that Cisco predicts will be 50 billion by 2020 is an order of magnitude larger than the number of smartphones and tablets in use today. If the energy consumed by these devices and the networks and data centers to which they are connected is considered, energy consumption by IoT will impactfully increase the rate of energy consumption growth.

Corcoran concludes: “There are two key societal challenges: those of privacy/security and energy consumption. These are often lost in the current ‘excitement’ that surrounds IoT, but ultimately these challenges will prove to be the key that determines the long-term sustainability of the internet of things.”

What he means is if the societal challenges are not considered, IoT technology is ready for the consumer adoption today.

Considering the societal challenges, more reports of IoT malware could spook consumers and slow Cisco’s forecast. If energy utility regulators do not factor in the IoT component in energy consumption forecasts and promote increased energy production by utilities, there may not be enough energy to power 50 billion devices.