Expert Insights

—

Telecom answers the open source call

The upside and drawbacks of massive industry change

IBM **Institute for Business Value**

IBM

Experts on this topic

Steve Canepa

General Manager, IBM Global Communications Sector and IBM Global Industry Managing Director, Telecommunications, Media and Entertainment (TM&E) Industry Solutions
linkedin.com/in/steve-canepa-a70840a
scanepa@us.ibm.com

Steve Canepa shapes IBM strategy for 5G, Edge Computing, network virtualization, and video services. A member of the IBM Global Performance Team, Strategy Team, and Industry Academy, he's been externally recognized as a top executive and market-leading expert in digital transformation.

Marisa Viveros

Vice President, Strategy and Offerings, IBM Global TM&E Industry Platforms
linkedin.com/in/marisaviveros
viveros@us.ibm.com

Marisa Viveros is responsible for 5G and Edge Computing strategy for CSPs, and the adoption of open architectures to address network modernization, automation, and the creation of new digital services. She serves in the governance board of Linux Foundation Networking, and is a member of IBM Industry Academy.

Jason Hunt

IBM Distinguished Engineer
linkedin.com/in/djhunt
djhunt@us.ibm.com

Jason Hunt has over 20 years of experience working with large enterprises to design and develop market-leading solutions in areas such as blockchain, IoT, and cloud networking. Jason leads IBM open source networking efforts, serving as chair of the Technical Advisory Council for Linux Foundation Networking and on the Technical Steering Committee for ONAP.

Open source projects provide the code to build upon and/or modify to create market-differentiating products and services.

Talking points

Open source has served government, banking, and the IT industry for years
Telecoms have been slower to adopt, or even participate in, the evolution of open source, an approach to software development that's targeted on largely or completely displacing proprietary software.

It's going to bring enormous change
Open source is now finding its place in telecom. And once it does, it will completely change the industry, requiring new skills and full participation of those in the domain.

Relationships among participants must be reset
Network equipment providers (NEPs) and software providers are part of the shift. Communications service providers (CSPs) seek to wrestle some control of the development of networking and put everyone on a more level playing field.

—

Software updates are faster than hardware fixes

Open source technology—the use of software code developed in the public domain—has been widely adopted throughout the enterprise world. According to a research study of developers, decision makers, and managers, open source use has gone mainstream.[1]

Now, open source is emerging in telecommunications as networks are being reinvented. Network function virtualization (NFV) replaces proprietary physical network appliances with an infrastructure less dependent on the underlying hardware. NFV and software-defined networks (SDNs) enable scalability, flexibility, and innovation better than a hardware design can. The use of open source software code further complements this new network design. It could eventually replace proprietary software running on vendor-specific hardware.

How does this benefit the consumer?

Networks built based on software capabilities and delivered through a cloud environment can be modified easily and often, even daily. Existing services will improve, and new services deploy faster. Instead of waiting for a new hardware-based solution that might come every few years or so, software can be modified easier than before.

90%

of enterprise software developers use two or more types of open source software, and over 50% are using five or more

79%

struggle with real-time support

53%

of enterprises aren't even aware dedicated third-party support services are available for open source technologies

Industry evolution versus open source adoption

In contrast to decades of building networks using hardware-based, proprietary network equipment, the move to NFV and SDN is transforming the way CSPs work. By helping to virtualize various appliances in the network, NFV and open common network cloud platforms are key enablers of 5G and the next logical step in network evolution. The emergence of these software platforms makes participation and cooperation of open source technologies more relevant. But it may also be delaying open source adoption in telecom.

Entirely new skillsets and processes

A radical switch to the separation of hardware and software-based open architectures requires more than a fresh industry mind set. For telecoms, the old way of operating requires multiple staff members to bring in hardware, test, certify, and install it, and replace it when it breaks. Operators depend on products and purpose-built hardware with vendor-specific code from a select group of NEPs. Less fragmentation and complexity within operations support was needed.

The idea that software is the center of value, rather than equipment, is a huge paradigm shift.

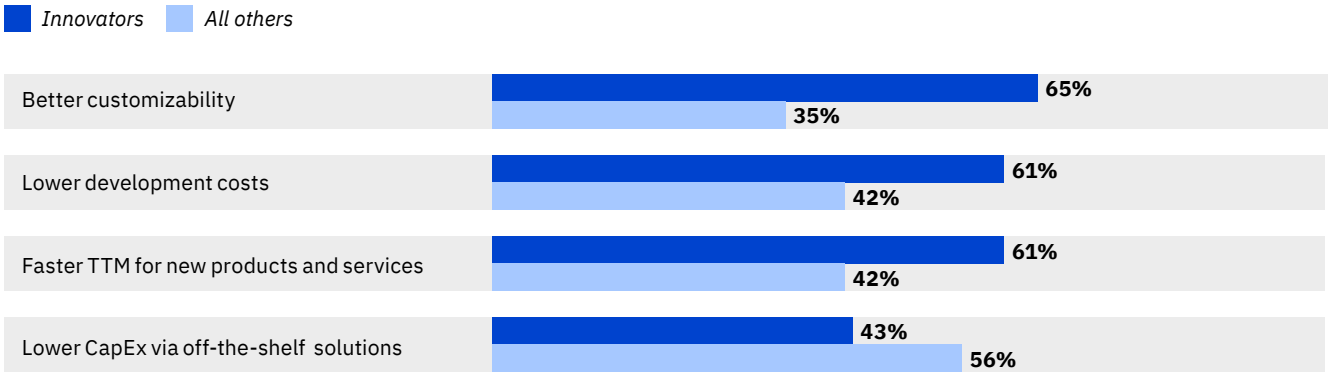
With open standards put forward by the Linux Foundation® and Red Hat, programmers and engineers are collaborating to design a framework that relies on no single vendor and designed to be interoperable and flexible (see sidebar, "AT&T: An open source-first approach to virtualization"). The Open Network Automation Platform (ONAP) is an open source networking project hosted by the Linux Foundation. Its goal is to develop a widely used platform for orchestrating and automating physical and virtual network elements. AT&T contributed its internally developed ECOMP automation and orchestration software, which was used to help create ONAP.

The impact of open sourcing

In a network virtualization survey of 200 global CSP executives, three archetypes were identified; innovators, evaluators, and laggards.[2] CSP innovators are already implementing NFV/SDN technology to support current or new services and say AI-supported automation is crucial in their network transformation roadmap. For innovators, better customizability is open source's number one industry benefit (see Figure 1). Lower development costs and time-to-market (TTM) for new products and services are seen as two other key advantages.[3] Capital expenditures (CapEx) reduction—once seen as the main motivation for open source in the telecom industry—is ranked lower by innovators, but still seen as the main driver by the other archetypes.

Figure 1

Advantages of open source for network virtualization



Source: Question. "What are the advantages of open source for network virtualization?" Percentages represent the number of respondents who selected 3 or 4 on a 5-point scale. IBM Institute for Business Value.

AT&T: An open source-first approach to virtualization[4]

Seeking cost savings and faster times to reconfigure and deploy new services, American carrier AT&T replaced physical appliances with automated, internally developed software controllers. AT&T is on track to have 100 percent of its core network virtualized in 2020. AT&T plans on using Red Hat's open source platform to manage workloads and multi-cloud capabilities around 5G, Edge Computing, and Internet of Things (IoT).[5]

At a high level, open source creates capital and operational savings in replacing network appliances and transitioning into cloud. Open source technology can fundamentally change the way operators build and run their networks today by:

Significantly reducing the time and cost to develop new products and services. The open source community creates the code that network operators and suppliers can build upon or modify to create marketing-differentiating products and services.

Liberating CSPs from vendor lock in. Unlike sourcing solutions from a limited set of vendors, open source unlocks the power of a developer ecosystem that can respond quickly to ever-changing market demands.

Enabling greater multivendor interoperability than the traditional standardization model. Open source creates *de facto* standards that are the results of NEPs, network operators, and others collaborating on common needs and challenges. The network operators, suppliers and users, such as enterprises, can build their own functions on top of that foundation as a way to differentiate their products.

Supporting easier integration. The looming approach of 5G aside, 4G and 3G network architectures will persist. Access to the latest technology innovations on an open hybrid cloud network platform can modernize existing capabilities.

Increasing network security by allowing more people to scrutinize the underlying code. Telecoms once relied on security evaluation done by their vendors. Only a few select people understood the vendor-specific code running on purpose-built hardware.

Working in the open source community requires each participant to be a collaborator not a dictator.

Going in with eyes wide open

Beyond the benefits and opportunities telecoms can glean from open source environments, there are—of course—risks and challenges to be mindful of.

The idea that software is the center of value, rather than equipment, is a huge paradigm shift. Network designers will need the same skills as software developers, but domain expertise must remain. Such a cultural change will take time and patience as IT and network departments integrate. New skillsets will emerge, including how to work according to open source principles.

It may also be difficult to marry long-held and traditional specification work—for example, regulatory demands about lawful interception—with the somewhat anarchic world of open source software. The regulatory demands are still there, they're just handled differently.

Last, hackers have more opportunity due to public access to code. The more software runs a network, inevitably the more it's targeted. But there's a saving grace. In the open source situation, more eyes on code increase the likelihood of ferreting out and fixing flaws before hackers find them.

Count the costs

The common perception is that open source is free. It isn't. As CSPs adopt open source, costs can be categorized in three areas:

1. Participating in open source organizations, which is highly recommended in order to influence how things are developed and where there's typically a cost to join.
2. Dedicating people with the right skills, like developers and architects, to contribute to open source organizations.
3. Working with a company that provides subscription support for software, and adopts an upstream first principle, unless a telecom plans to support open source in-house.

Open source is imperative for telecoms

Not only does open source impact innovation for telecoms, it's a needed boost to stimulate it. As of late 2018, 69 percent of telecoms indicated they were using open source software in production.[6]

Since new and emerging technologies can be culled from a wide variety of vendors and developers, open source lets telecoms switch it up and serve "best-of-class" network and IT functions to their customers. With no vendor lock in on network and IT functions, telecoms can create and maintain a competitive environment where vendors must compete for their business.

Action guide

Telecom answers the open source call

Moving from the traditional standards of network development to an open source environment isn't easy. A successful transition will be based on a number of factors.

1. Play well with others

Open source is a group effort. Suppliers, standardization bodies, academia, and IT and cloud providers need to be able to compromise, and work in full and open cooperation with each other, while enforcing upstream code to avoid using a software solution that's only maintained by one supplier.

2. Bring dedicated resources to open source organizations

Collaborate with open source groups like Linux Foundation Networking, and standards organizations, such as the European Telecommunications Standards Institute (ETSI) and the TM Forum global industry association for service providers and their suppliers in the telecommunications industry.[7] Partner in proof-of-concept catalysts projects.

3. Prepare to change the telecom culture

Telecom operators should realize there may be resistance as staff roles change and skills adapt. Train staff in open source skills and hire the right talent. The bonus: software developers will gain deep network skills.

About Expert Insights

Expert Insights represent the opinions of thought leaders on newsworthy business and related technology topics. They are based upon conversations with leading subject matter experts from around the globe. For more information, contact the IBM Institute for Business Value at iibv@us.ibm.com.

Notes and sources

1 Source: Commissioned study conducted by Forrester Consulting on behalf of IBM. October 2019

2 Viveros, Marisa, Thomas Tattis, and Rob van den Dam. "Re-envisioning the CSP network: How adaptable, thinking networks pave the way for 5G." IBM Institute for Business Value. June 2019. https://www.ibm.com/downloads/cas/73NVRNRY

3 Ibid.

4 Wagner, Mitch. "AT&T on track for 100% core network virtualization next year." LightReading. September 2019. https://www.lightreading.com/carrier-sdn/sdn-technology/atandt-on-track-for-100-core-network-virtualization-next-year/d/d-id/754104

5 Kapko, Matt. "AT&T and IBM Collaborate on Open Source, Edge, SDN, IoT." SDX Central. July 2019. https://www.sdxcentral.com/articles/news/att-and-ibm-collaborate-on-open-source-edge-sdn-iot/2019/07

6 "Open source is core to Telco modernization projects." Red Hat. October 2018. https://www.redhat.com/en/blog/ons-europe-open-source-core-telco-modernization-projects

7 The Linux Foundation. https://www.linuxfoundation.org/projects/networking; ETSI. https://www.etsi.org; TM Forum. https://www.tmforum.org/about-tm-forum

IBM Corporation
New Orchard Road
Armonk, NY 10504

Produced in the United States of America
February 2020

90030590USEN-00