

## AT&T Innovations

# Software is Our Thing: How We're Using Software to Continue Our Transformation



### When you think of AT&T, you may not think of us as a “software company.”

But maybe you should. Our scientists and engineers at AT&T Bell Labs made significant contributions to software that have changed the world. Those pioneers invented software languages such as C++, Korn Shell, Unix, and S (predecessor to R). Those languages are the foundation of every application, network or service that is available through the web, cloud, mobile or other compute devices.

Fast forward the clock 20 years later, and it's easy to see how software has spread throughout our daily lives. From the apps on our phones and tablets, to the navigation and collision-avoidance systems in our cars, to the voice-enabled assistants on our kitchen counters, software is central to our lives.



**But the software revolution didn't end at your front door or driveway. It's happening in the network, too.** The old network model of sending technicians out in trucks with crates of network gear just couldn't keep up. Data traffic on our wireless network has grown more than 470,000% since 2007.

### So, we turned our network into software.

Just as your gadgets turned into apps, so did our network gear. Both are software running on servers instead of smartphones. It's a better, unprecedented model that we had to invent as we went along.

We release a lot of our work into open source. In the past two years alone, AT&T Labs has contributed over 10 million lines of code into the open source community. To put that into context, a million lines of printed code is about 18,000 pages of text.

We contributed code and co-led the formation of a number of open source networking and cloud projects, such as ONAP, Akraino, and Airship. We've also released software into open source to expedite innovation in the areas of big data and artificial intelligence. Check out our projects on Acumos, RCloud and Nanocubes. Open source has helped us to drive economy of scale, ensure interoperability and expedite progress through open collaboration.

Inside AT&T, we've adopted best software practices and DevOps models for service and platform development, integration and testing. Our software developers, architects and engineers are involved in daily scrum teams to help build our 5G and software-defined network. We've turned many of our legacy applications to software-based microservices running on commodity off-the-shelf hardware. This transformation has not only allowed us to reduce our capital and operational costs but has also provided us the flexibility to program our network, operate efficiently and optimize our traffic flow to best serve our consumer and business customers.

In 2018 we received 1,203 patents – about five every business day – and the vast majority of those were software-related.

Software is increasingly at the heart of everything we do. Whether a patent or an open source project, software is the future of AT&T. Software is our thing.