

Microservices: Leading with Speed



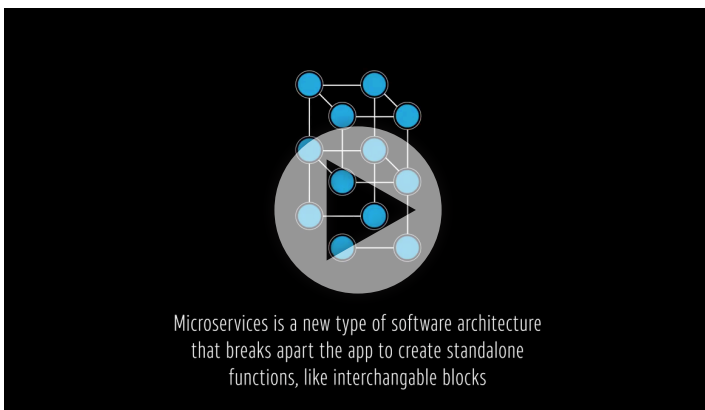
Microservices are an architecture for building applications that will give customers more control of their network services.

The microservices architecture evolved from the increasingly cumbersome process of managing complex, monolithic-style business applications that are built as one unit. Making a single change to a monolithic app means the entire application must be rebuilt, retested, and redeployed.

Qualities of microservices include the following:

- **Breaking apart enterprise applications into independent services that work together, making it easier to update individual aspects of an application without impacting others.** Being able to update these standalone components means updates can be made in days rather than months.
- **Modular software elements that enhance automation by creating common, reusable functions and data feedback loops** that allow for faster development of products and services and personalize the customer experience.
- **Supporting address validation, payments, billing, and trouble ticket creation.** For example, if network traffic spikes and more capacity is needed, a microservice could automatically enlist more network resources without a human operator intervening.

AT&T believes microservices are the future of software development. We announced our microservices platform in 2017 as a key pillar of our Next-Gen Network platform, allowing for faster deployment of new capabilities and increased automation. We are incorporating microservices into our Software Defined Network (SDN) and Network Functions Virtualization (NFV) to give customers greater control of their services by enabling a software-based network to run on standardized hardware.



We are currently decomposing many of our 2,200+ enterprise applications into microservices to create agility, speed, and scalability that was not possible before. We are collaborating with key industry participants IBM and Accenture as part of the Microservices Supplier Program we launched in 2017. IBM joined the supplier program at launch and Accenture joined in 2018.

We have deployed microservices in our open source applications like Acumos, our artificial intelligence platform, as well as in our Open Network Automation Platform (ONAP), the brains of our Software Defined Network (SDN),

to deliver virtual network functions to internal and external customers faster than ever before. Internally, microservices deployed in one business initiative resulted in about a 30% improvement in our speed to market on projects initiated in 2017. Production downtime dropped by 180 hours and many services can now be rolled out in under 5 minutes. This has translated into a savings of millions of dollars per year.