

# Operating Networks in the Age of IoT and 5G

The advent of 5G requires equipping network operators with the visibility they need to identify and manage service and operation issues across entire networks.

By Allen Johnston / EXFO

Everything is connected. The GSMA forecasts that the number of IoT connections worldwide will hit 25 billion by 2025, creating a market that could be worth \$1.1 trillion. Need more proof? Google recently bought connected device-maker Fitbit for more than \$1 billion, putting it head to head with Apple in the wearables category. There will be more of these acquisitions as organizations see the potential to connect more revenue-generating devices to new 5G networks, which offer greater bandwidth and reliability and ultra-low latency. But with increased connectivity comes the potential for increased risk and complexity.

Mobile users tolerate a lot in terms of service outages and network problems. Most don't like to make a fuss and won't bother to report even issues that affect their mobile experience – unless it becomes a regular occurrence. (Stats from an Ipsos survey show that after experiencing the same issue four times, a subscriber is 80 percent likely to churn, or cancel service with a provider.) Mobile users largely tolerate experience issues and faults, preferring not to contact their operators and hoping that problems will fix themselves and go away. In fact, more users churn than call. It's the path of least resistance for people to get what they want.

Current technology leaves operators largely blind to many service outages and network

faults that harm or impair user experience. To resolve these issues, operators need tools and processes that give them visibility they need to identify and manage specific service issues or points of failure across entire networks.

## RISE OF CONNECTED DEVICES

Connected devices are very different from humans. When connectivity cuts out, devices don't handle it very well. Unlike humans, machines don't understand the softer nuances of tolerance and calculate their condition as either on or off, working or not working. When connectivity diminishes or breaches performance thresholds (becomes too slow, or too unreliable), the devices are at a loss. They lose control entirely, and, unlike humans, do they ever complain!

By 2025, five times more devices than humans will consume 5G networks. This will deluge network hosts with gargantuan volumes of data (700 times more than today, according to technology vendor Ericsson's research estimates). Devices will demand literally perfect connectivity conditions to carry out their defined purpose. For operators and their network engineers, this data deluge will cause headaches, problems and confusion, unlike any they've ever seen.

Human network engineers responsible for network performance want to help, but the complexity of today's architectures means

they often identify problems only at the last moment. Then they race against time to fix them. If operators already face pressure to maintain reliable network services and connectivity to their tolerant human users today, what will their service-center screens look like in five years when the data volumes – and service demands – increase?

Connected devices will be the primary source of revenue for 5G. More mission-critical connected apps, devices and services – from autonomous vehicles to robotic surgery to real-time security surveillance – mean that some industries will depend almost entirely on reliable connectivity. Without it, businesses will face critical consequences. More than ever, operators will have a huge responsibility to their customers. Their success and the success of their customers are inextricably entwined.

### AUTOMATED ASSURANCE IS KEY

The broadband industry must radically rethink its approach to network performance. Breakthrough network automation technology plus artificial intelligence (AI) and analytics-based machine learning mean operators' network performance and service-assurance efforts don't have to be reactive anymore.

Despite that network automation is intended to make network management easier, operators report a 46 percent increase in critical outages over the last three years, 65 percent of which originated from virtualized network domains. At the same time, only 15 percent of communications service providers have a fully integrated view of their networks and service inventories. Complete visibility into the performance of the network, service quality and customer behavior are critical, especially as the rollout of 5G accelerates.

Automated assurance, driven by AI and machine learning, will be essential to the goal of creating fully autonomous operations, especially as network complexity explodes. Here are three reasons network operators need to consider more automation to avoid increased network outages.

- 1 The network is always on.** Granular automated monitoring augmented by machine learning is almost a requirement as networks get loaded with devices more complex than just humans on phones. Human network engineers also can't be on 24/7. In the ongoing battle to keep networks performing at optimal levels, operators need to look at where machine learning can lessen the workload and improve service.
- 2 Predictive analytics can stop problems before they start.** That same level of granular visibility also helps networks learn to recognize, anticipate and preemptively resolve problems before they occur. Currently, operators usually can solve problems only after they happen. But predictive analytics will allow operators to learn from previous experiences and spot patterns that indicate imminent problems and address them before they have real impact.
- 3 Without full visibility, 5G will not deliver on its full potential.** 5G requires a full picture. Only fully automated performance visibility will be able to see the

complete picture. It's like an air-traffic controller being able to see only big planes and not little planes. Because people are no longer the only ones accessing the network, operators need to see cause and effect from several different vantage points, many of which are beyond the limits of human calculability.

Today's networks are evolving at a pace that engineers can't possibly keep up with. The number of devices has multiplied and will continue to grow. As consumers and business users alike await the promise of complete 5G services, operators must be able to proactively guarantee a consistently high level of performance from their networks.

Deploying new performance and assurance technologies that take advantage of advanced analytics and predictive AI will help cover a network – not just the service chain but all services running over it. This way, the extension to connected devices or sensors is under one umbrella, and operators have a much better chance of smooth service across the board. ❖

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