

Enriching the society and the world through mobile internet

A Customer Success Story

UQ Communications (UQ), established August 29, 2007 as a broadband wireless access (BWA) provider launched in 2009 its high-speed mobile data communication WiMAX service that offered a maximum speed of 40Mbps (downstream)*. It later launched “WiMAX 2+,” a higher-speed service achieving 110Mbps (downstream) at the maximum in 2013 to support an increasing number of mobile devices used and respond to a growing need for high-speed communication, and successfully increased its speed even up to 220Mbps (downstream) in 2015, becoming the world’s first to use the 4x4 MIMO technology for mobile communication.

The unique slogan of this company is “Enriching the society and the world through mobile internet.” It was founded in August 2007 as a Broadband Wireless Access (BWA) operators. In 2009, it began offering high-speed mobile data communication service “WiMAX” with up to 40Mbps (downlink). Then in 2013, it enhanced its capacity to 110Mbps to meet the ever surging need for high-speed communication in the mobile industry.

WiMAX 2+ was started in order to achieve an ultra-speed internet service provision. WiMAX 2+ is the first in the world to adopt the 4X4MIMO technology in 2015 with a speed increase up to 220Mbps (downlink). In addition to taking advantage of the 4G LTE line of KDDI such as the start of the phone service “UQ mobile”.

* As of April 2016, the WiMAX service was downgraded to 13.3Mbps for radio bandwidth reassignment to WiMAX2+ service.

“We are continuously pursuing new technologies and working toward adopting them for the sake of customer quality of experience and to provide high-speed and high-quality service to them throughout the country. We were the first to launch a mobile WiMAX service in Japan as a commercial service and also to introduce in the mobile service MIMO technology that had been mainly used for Wi-Fi. Though we needed to overcome difficulties when introducing new technologies, the experience helped us accumulate know-how at the same time. We were the world’s first to apply 4x4 MIMO for WLAN to mobile. UQ is seen as a pioneer,” said Mr. Toshikazu Yokai, UQ Communications Corporate Officer and Director of Technology Division.



To maintain the quality of the wireless network, test specifically for wireless communication, not just those for the wired network, are critical.

A failure in September 2011

A typhoon hit Tokyo and its metropolitan area and paralyzed the public transportation services. The WiMAX network at that time was slowed for many hours due to heavy unexpected traffic causing terrible network congestion.

This issue made UQ keenly aware of a large gap between the load applied by test traffic and that by actual traffic and the importance of understanding the behavior of the network devices under actual load. As such, UQ was convinced they could not make its network stable without emulating actual load in the test phase.

UQ then chose as a test tool Landslide, a product of Spirent Communications (Spirent) headquartered in the US. Spirent has been supplying the market with mobile performance test equipment for more than 30 years, and its Landslide solution, from the Mobility Infrastructure Business Unit, is considered a standard system for core network performance test for mobile communication.



Mr. Toshikazu Yokai, UQ Communications Corporate Officer and Director of Technology Division and Mr. Hiroshi Tanno, Assistant Manager of IP System Section, UQ Communications. UQ Communications is a Broadband Wireless Access provider in Japan.

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The solution

We used Landslide as a load generator when verifying operation, but we only used it to create “typical” test traffic,” said Mr. Hiroshi Tanno, Assistant Manager of IP System Section. It was quite difficult to replicate the actual traffic on the production network mostly due to its dynamic and complicated nature – traffic can be extremely congested at times with various contributing factors added, for instance.

We then explained to TOYO (Spirent’s channel partner in Japan) that we needed features to emulate those complicated changes in traffic to prevent the network from failing and asked TOYO to develop them. TOYO then agreed to provide the requested features with Landslide.

“The remote test feature was most helpful,” added Mr. Tanno. UQ’s test lab was remotely located from the headquarters at that time. Their test engineers needed to travel a long distance every time the network equipment was updated. Resulting in longer down-time and expensive truck rolls. Landslide features enabled the engineers to perform all tests from a remote location via remote login and helped them complete their test in a much shorter time.

Mr. Tanno characterizes Landslide as “a tool for meticulous people, but it’s quite flexible.” For UQ, who continuously seek the best technologies, it is important to have flexibility and control in multiple scenarios and try anything it wants and in whatever way. This also drives their swift development and quality improvement.

Communication quality control from customers’ standpoint

UQ, as a mobile carrier, has faith in, among others, an idea of “always have a customer’s perspective.” With this idea in mind, they place an extreme importance on the service quality in addition to continuously pursuing new technologies. Robust network is demanded of carriers in view of the possible serious impact a network failure may have on society, as telecommunication has become indispensable infrastructure for everyday life.

UQ has a better chance of avoiding troubles in a timely manner by detecting signs of troubles beforehand. To this end, UQ considered building a system to monitor the overall communication status. One way of testing the network in operation is that you test it while emulating every possible situation where mobile devices are used. In reality, however, you tend to end up waiting for customers to report problems they have encountered as performing such a test is difficult.

UQ has a system in place for each of the devices that make up the core network to monitor their operation. The system, however, is used mainly for checking the operation of each device and not for checking the communication-it is difficult to check communication itself with such a system. Even if each device seems to be running normally, that does not rule out the possibility that communication is having some trouble.

“Our customers are most pleased when their communication is performed comfortably - they never care about the backend network equipment. In other words, we needed a system to check the quality of service from the customers’ viewpoint rather than to check the status of each piece of communication equipment. Such a monitoring system that works in the interest of customers was not available until then,” explained Mr. Tanno.



Use Landslide as a monitoring system for customers

UQ then came up with an idea of using Landslide. In its lab, Landslide had already been used in various tests running as a sophisticated mobile device with control features and test features implemented in it.

Being the industry standard tester, Landslide offered various interfaces and interoperability with equipment from a number of vendors. For this reason, the Landslide could be the most suitable monitoring system for UQ's core network system comprised of devices from multiple vendors.

"Unlike a system for research and development, every system installed in a production network is always mission-critical. Though we once had a plan to build a monitoring system on our own, we finally decided to use the Landslide that we know is a reliable system from experience," said Mr. Tanno.

Landslide EDGE is now installed in UQ's live network to monitor the status of the entire core network as well as the respective devices. It enters its logs in the management system so that the Operations Team can check the status graphically on the management screen. The statuses of the core network and respective devices are indicated in 3 different colors – green (normal), yellow (caution) and red (abnormal) – and this enables the identification and quick fix of a failed device.

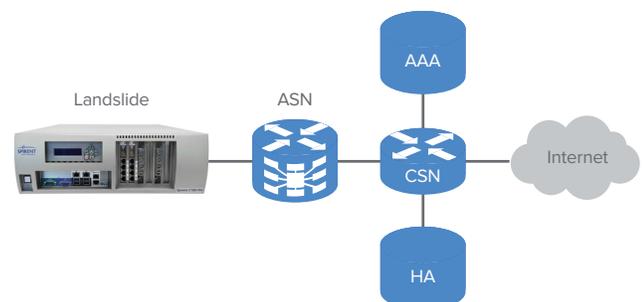
"It used to take us a great deal of time to pinpoint failure details after seeing trouble, which sometimes prevented us from addressing a breakdown in a timely manner. Since we started using Landslide EDGE as a monitoring tool, it has been possible to quickly locate the problems that could not be found easily in the conventional method. This has greatly contributed to the stable operation of the network," Mr. Tanno added.

Furthermore, Landslide, used as a monitoring system, has brought about many other benefits. For example, when some changes are made to the settings on a network device, you need to verify that these changes do not affect mobile communication. In the past, UQ performed such verification using various test devices after those changes are made and needed to spend much time to test every possible combination.

With Landslide, however, UQ is now able to quickly check the network's status any time while making changes to the settings. As the network status is available at hand, UQ can go back to the previous settings immediately even if some trouble occurs. This has led to a safer network and enabled UQ to manage the network in a more adequate way.

Landslide is also useful when UQ works with their partner MVNOs. When a trouble occurred while a number of MVNOs used UQ WiMAX to provide their communication services, it was difficult to quickly identify where the cause lay, on UQ's network or MVNO's. MVNOs connect to UQ WiMAX using different types of connection, which sometimes causes communication troubles. Monitoring the entire core network, the Landslide can quickly detect changes in the status and enables UQ to swiftly address the trouble together with the MVNOs.

"TOYO provides us with technical assistance and advice always sharing the same 'customer-oriented' mindset with us. We feel strong when working with TOYO as they are not a mere solution supplier, but a partner who helps us develop our business," said Mr. Tanno.



WiMAX network monitoring diagram

Count on expansion and enhancement of the Landslide for more advanced quality control

Mr. Tanno is planning to use the monitoring data collected by Landslide for many other purposes.

The data may be used for realizing more advanced quality control by adding “time” as another metric. With this, UQ could perform more detailed evaluation of the status and find out such details as whether connection is stable and whether there is an authentication or network connection problem.

UQ now intends to enhance customer satisfaction by addressing quality issues in an even more timely manner while accurately understanding the service condition using the Landslide.

Mr. Tanno is looking to future enhancement to the Landslide in order to implement the plans above.

In closing, Mr. Tanno said, “Now that we have a compact monitoring tool that runs 24/7/365, that can be installed in small communication stations and will help perform more extensive and finer quality control, we are confident that Landslide and TOYO will continue to make great contribution to the development of UQ.”

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