



Success Story

Zyxel's Innovative Repeater Turns One Bar into Three and Brings Dead Zones to Life in Beijing Basement Office



Real estate

INDUSTRY



CUSTOMER

Beijing
Capital
Development
(BCDC)



COUNTRY

China



SOLUCIÓN

In-Building
Cellular
Coverage
Solution

Overview

Challenges

- Overcome weak cellular signals and dead zones preventing phone calls and internet access in basement office space
- Deliver strong cellular signals for all mobile carriers
- Provide a solution allowing easy planning and cabling

Results

- Stable call and internet quality accessible across 3,600m², even in hard-to-reach areas
- Easy-to-install, plug-and-play solution deployed and installed with coaxial cables in a single day, even in hard-to-reach areas
- One-bar signal in the basement increased to three bars
- Unique oscillation-avoidance technology prevents interruption from neighboring base station

Solution

- Zyxel In-Building Cellular Coverage Solution

"Zyxel Networks has been a fantastic partner, especially with their pre-sales tech support and responsive services. They really made this project a worry-free experience for us by helping with the on-site survey, mapping proper solutions in detail, and running installation tests. And then the actual solution itself really came through – the client has a reliable and high-performance DAS system that delivers strong signals and powerful features. It provides an excellent user experience, and because of that, our customer is more than satisfied with the solution."

Ping Wang
General Manager, Beijing Janbotime

Background

Beijing, the most populous city in the world, is also the scene of a boom in high-rise building construction. Residential towers are shooting up, with developers vying with each other for the attention of the Chinese capital's burgeoning middle and upper classes.

Although telecommunication technology and infrastructure in China has advanced rapidly in recent years, there remains room for improvement when it comes to seamless and smooth connectivity indoors, even in a metropolitan city like Beijing. For networks in these places, signal blind areas and poor signal strength are two of the most common cellular telecommunication problems.

This recently became apparent to Beijing Capital Development Co., Ltd. (BCDC), one of the city's leading

real estate developers. The publicly listed company, which boasts annual turnover exceeding 100 billion yuan, has completed construction projects spanning over 50 square kilometers, including working on high-profile projects like the Beijing Olympic Village, Shunyi Olympic Rowing-Canoeing Park, and the National Indoor Stadium.

Even with such experience and expertise under its belt, BCDC ran into persistent signal problems at its new flagship residential tower project in Beijing's north. There, the company had a two-floor building (one ground level, one underground) housing a sales center, reception, and office used to greet and negotiate with potential buyers.

Challenges

In the building's basement level, staff found cellular signals to be weak to the point they could not support daily operations. This had brought their business operations to a standstill, with internet use nearly impossible and phone calls just as difficult. They needed a rapid solution that would ensure smooth, high-quality, and uninterrupted connectivity.

Connectivity was weak for all the country's three mobile network operators, with China Mobile, China Unicom, and

China Telecom users getting signal strengths of around -105dB, -103dB, and -114dB, respectively. The China Mobile and China Unicom users were just able to maintain internet connections, but with effectively unusable speeds; meanwhile, the China Telecom users were not able to connect to the internet or make phone calls at all.

Solutions and Benefits

BCDC turned to Beijing Janbotime, a system integrator with rich experience in indoor distribution systems. After an on-site survey, they decided to use Zyxel's innovative **SymmRepeater^{Enterprise}** indoor distribution antenna system. The decision was partly due to Zyxel's reputation in the Chinese market for high-quality products and long-term after-sales support, in addition to BCDC and Beijing Janbotime being impressed by the solution's far more innovative approach compared to those of local vendors. The product is designed to improve cellular coverage and signal strength in high-rises, elevators, and underground parking spaces to ensure reliable connectivity for high-quality voice and data communication – exactly what BCDC was after.

Traditional repeaters require at least three bars of signal strength by a window in order to extend connectivity. With its patented two-level signal amplification and support of up to 100dB system gain, however, **SymmRepeater^{Enterprise}** is able to boost weak signals

as low as one bar of signal strength. Using its dual-symmetric architecture, the solution can amplify signals and transmit to deeper dead-zones, delivering clear voice and smooth data up- and downlinks in basement levels.

The signal-blind and shadow-obstructed areas as well as pilot contamination from neighboring cells are major factors causing poor communication quality. **SymmRepeater^{Enterprise}** supports **Full Band Signal Amplification**, which can simultaneously amplify the signals of multiple operators in the frequency band.

In addition, the solution's DAS technology doesn't affect operators' signals from base stations, and can amplify signals and reduce noise and echo. Supporting unique oscillation-avoidance technology, it enables outstanding isolation with auto signal levelling and auto uplink muting, making the repeater invisible to operators.

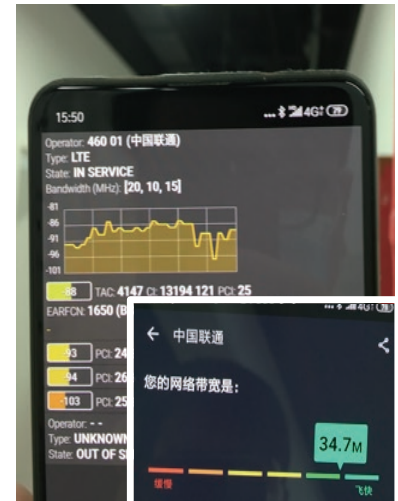
Back at the construction site, the donor unit (DU) and two donor antennas were installed on the building's rooftop. In the basement, a service unit (SU) was installed in the low-voltage room, and four service antennas were installed in the corridor. The deployment process revealed one of Zyxel repeater's other advantages: its easy deployment. The installer can use low-cost coaxial cables to deploy both the indoor and outdoor antennas, and can utilize LMR-400 and RG6/RG11 cables, which are easily available on the market. Furthermore, as they support PoE, both the DU and SU can be powered by a single Ethernet cable. In fact, the entire installation process took only one day.

Immediately afterward, the signals of the three operators increased significantly, improving by between 15dB to 20dB. Staff now have full signal bars from all three operators. Not only do China Mobile and China Unicom users now enjoy high-speed internet and crystal-clear, interruption-free phone calls, but China Telecom users have full bars and experience no difficulty in making calls, using the web, and even making WeChat video calls.

With the SymmRepeater^{Enterprise} in place, work efficiency saw a day-and-night change. The outcome has been enthusiastically welcomed by BCDC, which says it's eager to use more of Zyxel's repeaters in its new residential tower sales centers moving forward.



Before
installation



After
installation

Comparison chart

Signal Strength	China Mobile	China Unicom	China Telecom
Before installation	-105dB	-103dB	-114dB
After installation	-89dB	-88dB	-95dB

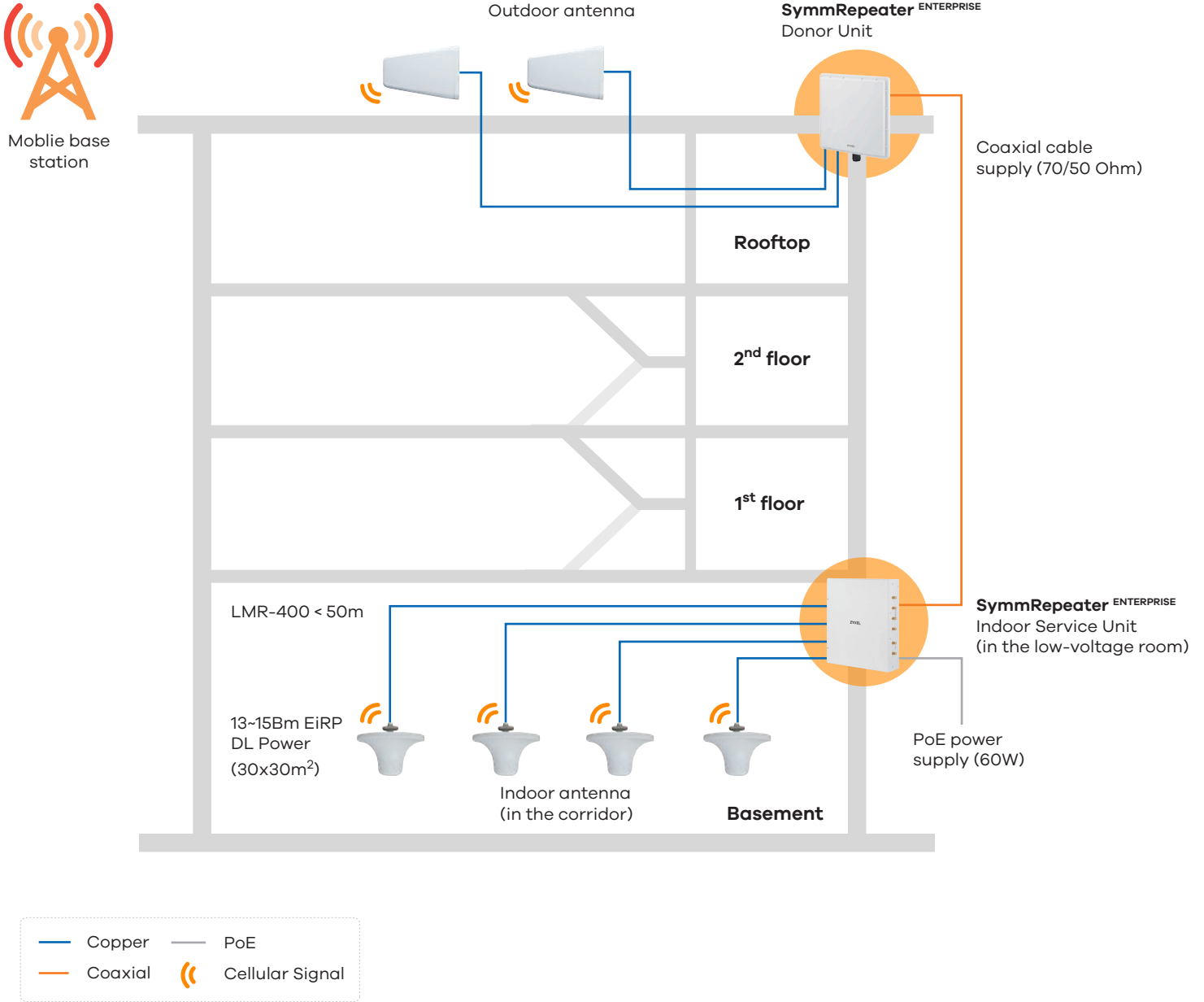
Products Used

SymmRepeater ^{ENTERPRISE} Donor Unit and Indoor Service Unit



- Support 2 bands (selectable)
- Support 2G/3G/4G LTE
- End-to-end path length: up to 500m
- Support channelized or full bandwidth
- Service antenna port: 4
- DL Power up to 17dBm
- Oscillation avoidance
- Input power with auto leveling algorithm
- Max. end-to-end gain: 102dB (Tunable)
- Max. coverage space > 3,600m²
- IP65 Donor Unit

Diagram



About Zyxel Networks

Focused on innovation and customer-centricity, Zyxel has been connecting people to the Internet for over 30 years. Our ability to adapt and innovate with networking technology places us at the forefront of creating connectivity for business and home users. We're building the networks of tomorrow, unlocking potential, and meeting the needs of the modern workplace — powering people at work, life, and play. Zyxel, Your Networking Ally.

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