

Gorilla Forest Lodge: GPON Technology for a Resort in the “Gorilla Park”

Gorilla Forest Lodge is a hospitality structure of exceptional charm in Bwindi Impenetrable National Park, Uganda , a protected area that hosts over half of the planet’s mountain gorillas. Thanks to the GPON technology implemented with Fracarro solutions, guests today have access to advanced digital services for a stay of comfort and relaxation, even in this unspoiled natural context.

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Gorilla Forest Lodge is immersed in the Bwindi Impenetrable Forest , a protected area that hosts over half of the planet’s mountain gorillas. With animals coming close to the structure , the Lodge is a dream for all nature lovers.

Located in the heart of the Bwindi Impenetrable Forest in Uganda, Gorilla Forest Lodge reopened in June 2025. It is a unique Lodge for the experience it offers, as it is situated inside the park (Bwindi Park) that hosts over half of the world’s mountain gorillas. With animals reaching the edge of the structure and trekking for sightings, the Lodge is a dream for all nature enthusiasts.

The property is owned by Abercrombie & Kent (A&K), an international group founded in 1962 and today active on multiple continents, with lodges in Africa, river boats in Egypt and Peru, and cruise ships through the Crystal Cruises brand. The term “reopening” is used because a major renovation project transformed the previous Gorilla Forest Camp, an already high-level glamping facility, into Gorilla Forest Lodge, a hospitality structure of ten masonry villas with first-rate hotel standards.

In this case study, we will discuss, in particular, the implementation of GPON technology and how the infrastructure was configured to ensure customers performance



and continuity of connectivity and services. This was not a simple challenge considering the particular context, characterized by wilderness, irregular terrain, and a humid and rainy climate.

We speak with those who collaborated on the project: Gian Luigi Chiesa, IT Operations Automation Director, Crystal Cruises - Abercrombie & Kent, and Michele Molin, GPON Product & Strategy Manager, Fracarro.

THE CHALLENGE: QUALITY SERVICES, UNTAINTED NATURE, AND STANDARDS

The first contact between A&K and Fracarro began with a technical discussion and a presentation of GPON solutions. Interest quickly evolved into a phase of hands-on experimentation: at Abercrombie & Kent's Milan headquarters, a dedicated lab was set up to test, in real conditions, the guest-oriented services and applications running on a Fracarro GPON infrastructure. The positive outcomes of these trials strengthened mutual trust and paved the way for collaboration on several projects across Africa — with Uganda's Gorilla Forest Lodge at the top of the list. (See the dedicated box for more on this truly unique resort.) Here, together with Gian Luigi Chiesa, we take a closer look at the goals that led Abercrombie & Kent to adopt a GPON infrastructure, as well as the distinctive features that shaped the project from the very start.

High-Quality services and fiber optic advantages - The first goal A&K set for Gorilla Forest Lodge was clear: to ensure guests could enjoy the same technological standards that define the company's properties around the world. «Even in a remote and challenging environment like the Bwindi Impenetrable Forest, the idea was to recreate a 'no-compromise' experience,» explains Chiesa, «for a high-end international clientele, with digital services ranging from Wi-Fi connectivity and in-room telephony to on-demand content.» To achieve this, it was essential to rely on a network capable of guaranteeing reliability, delivering high performance, and remaining future-proof — all requirements that the GPON network is perfectly suited to meet.

An unspoiled natural setting - Gorilla Forest Lodge is a "scattered village" built along steep slopes. «The rugged terrain, unstable soil, dense vegetation, and heavy rainfall made a standard network impossible to implement,» explains Chiesa. «That's why we opted for a GPON fiber-optic architecture — a solution capable of covering long distances with high reliability and minimal need for active components. We knew installation would still be a challenge and would require specific precautions — which we'll detail later — to deal with the slopes, humidity, and frequent rains.»

Standardizing technology - Another key requirement was to maintain consistency with the company's global technological standards. «A&K uses uniform solutions worldwide — from telephones and video cameras to tablet and smart TVs — to ensure the same level of service everywhere, simplify



Gian Luigi Chiesa, IT Operations Automation Director, Crystal Cruises - Abercrombie & Kent



Michele Molin, GPON Product & Strategy Manager, Fracarro

> ***"Even in a remote and complex context like the Bwindi Impenetrable Forest, the idea was to bring high-level connectivity and services and recreate a "no-compromise" experience - G. L. Chiesa.***

The dedicated webpage for Gorilla Forest Lodge on the A&K website



The Wi-Fi network reaches rooms, indoor and outdoor common areas, but also the walkways and outdoor areas in the heart of the forest. This characteristic distinguishes the Lodge from the other structures near the park.

operations, and enable centralized support,» explains Chiesa. This led to a clear request for Fracarro: a network fully compatible with the systems the company was already using elsewhere. It was a requirement Fracarro was able to meet — whereas, as Chiesa notes, other suppliers had struggled to do so in the past.

A ONE-OF-A-KIND LODGE: GORILLA ENCOUNTERS, COMFORT, AND RESPONSIBLE TOURISM

The first defining feature of Gorilla Forest Lodge is its location — deep in the heart of Bwindi Impenetrable National Park, home to more than half of the world's remaining mountain gorillas. Trekking trails begin just a short distance away, and it's not uncommon for the animals to wander to the very edges of the property. Guided by experienced rangers, sightings are almost guaranteed, making this extraordinary experience accessible even to visitors who spend only a few days in the park.

The transformation from the former Gorilla Forest Camp to the new Gorilla Forest Lodge — featuring ten stone-built villas, a restaurant, shared spaces, and a small spa — marks a true leap in quality. Here, the authenticity of an immersive rainforest experience is matched by a level of comfort and service that sets a new standard for the region.

All this has been achieved with the utmost respect for the environment. The renovation followed sustainable principles, using locally sourced materials and architectural lines that blend seamlessly into the natural surroundings. Moreover, every stay helps fund A&K Philanthropy programs supporting both the conservation of mountain gorillas and the development of the Bwindi communities. In this way, the lodge stands not only as a place of exceptional hospitality but also as a genuine model of responsible tourism.

THE SOLUTION: A RING GPON NETWORK IN THE HEART OF THE FOREST

Together with Chiesa and Michele Molin, we take a closer look at the solution — a fiber-optic GPON network designed in a ring configuration to ensure reliability and uninterrupted service. Here's an overview before we delve into the technical details.

Broadband connectivity is provided by a microwave radio link supplied by a local operator, as A&K's usual solution, Starlink, was not available in Uganda. The link offers a capacity of around 60 Mbps and connects directly to the main hub — the network's central node, where all digital services converge before being redistributed. At this point, two OLTs (Optical Line Terminals — the devices that manage the GPON network and transmit signals along the fiber) operate in a redundant configuration to guarantee service continuity.

From the hub, eight fiber backbones branch out to serve the different areas of the lodge. Each area is equipped with optical splitters — devices that divide the signal into multiple paths to distribute connectivity to the various villas and public spaces — and local ONTs (Optical Network Terminals), which convert the optical signal into Ethernet connections within each accommodation unit or shared area. This setup ensures com-



Thanks to the GPON infrastructure implemented with Fracarro solutions, the Lodge offers extended Wi-Fi connectivity, in-room telephony, on-demand content on tablets, and video surveillance. In the photo, a guest room at the Lodge.

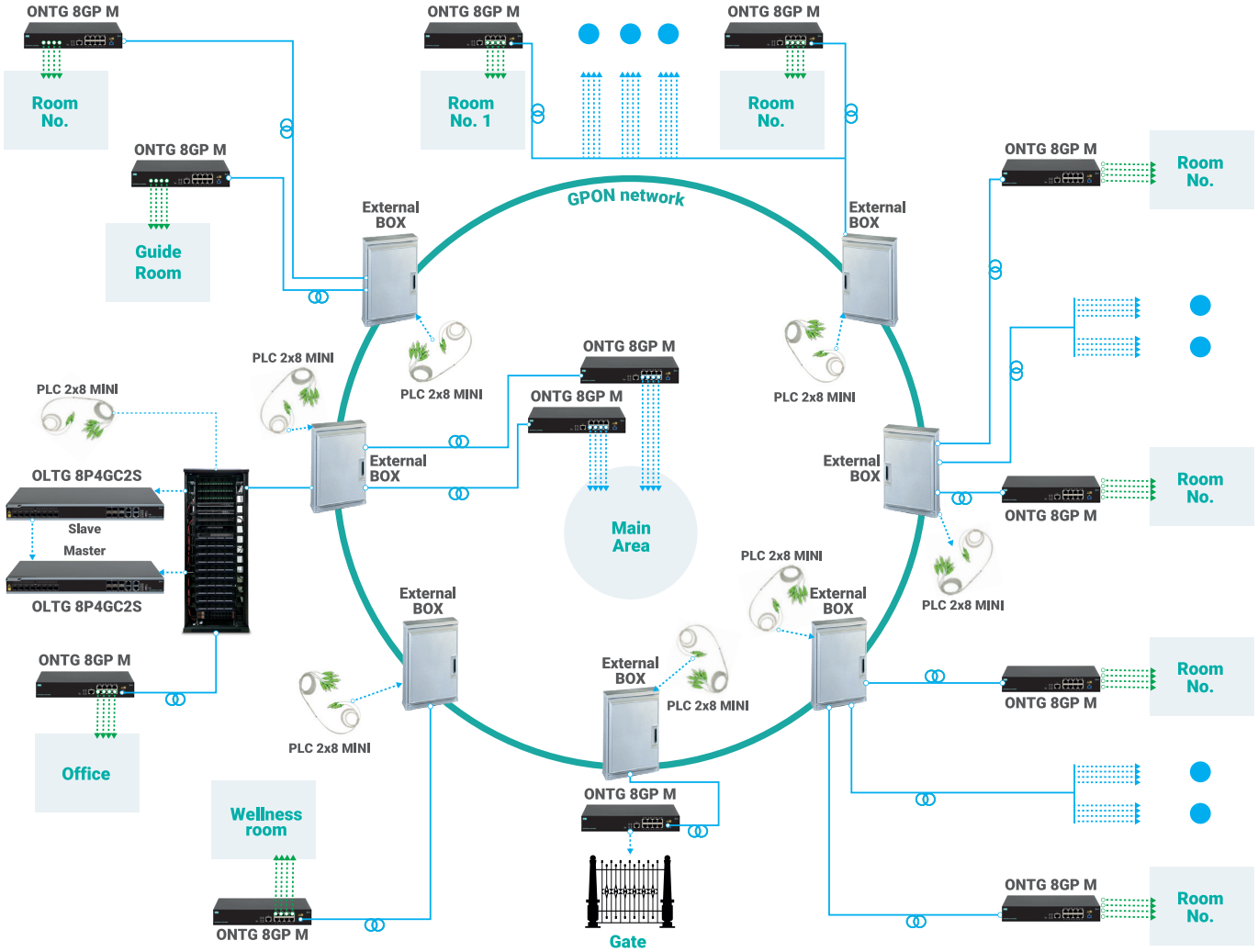
plete connectivity throughout the property, with all systems protected by UPS units and backup generators.

All GPON system components — including OLTs, ONTs, optical boxes, and splitters — are supplied by Fracarro, with the sole exception of the fiber itself, which was sourced locally for logistical reasons.

Ring Configuration - The fiber-optic network was built in a ring configuration — a circular link that starts from the main rack, runs through all areas of the lodge, and returns to its starting point. «This setup,» explains Molin, «ensures service continuity: if a section of the network is damaged, the signal can still reach the connected areas from the opposite side of the ring.» At each zone along the loop, junction boxes were installed where:

- The fiber serving that specific area is branched off and connected to the local optical splitter. «Each optical splitter,» Molin continues, «has two inputs and eight outputs: one input receives the signal from the active side of the ring, while the other remains on standby, ready to take over in case of failure. The eight outputs then feed the various villas or

Block diagram of the installed Fracarro GPON solution.





The installation of the optical fiber required specific solutions for the natural context, characterized by steep terrain, dense vegetation, and intense rain: protected routes, watertight junctions, barriers against humidity, and dedicated mountings on the slopes were implemented.

In total, the installation extends for about one and a half kilometers of fiber-optic cable, with the distance between the data center and the farthest point exceeding 400 meters.

OLT, Central Star, and ONT - At the heart of the system lies the main rack, which houses two OLTs (Optical Line Terminals — the devices that manage the GPON network by transmitting signals through the fiber), specifically the Fracarro OLTG-8PGC2S model. «These OLTs are configured in Type B redundancy,» explains Molin, «meaning one operates as the master while the other functions as the slave, automatically taking over in case of failure.»

Each OLT is connected to the main hub — the central node of the network where all digital services converge and are managed — via two 10 Gbps fiber links, providing a total of 20 Gbps of bandwidth per unit. Both fibers are active, ensuring consistently high performance.

«From the main hub,» Molin continues, «all the lodge's primary services are distributed over the GPON network via 12-core fiber backbones connected to the local splitters, reaching the eight different zones of the property. The ONT model used in each villa and common area, the Fracarro ONTG-8GP-M, is equipped with eight RJ45 ports with PoE (Power over Ethernet) capability. From these ports, all the connections for the lodge's digital services are deployed.»

Managing the Challenges of the Forest Environment - As mentioned earlier, the setting is far from simple: steep slopes, unstable ground, dense vegetation, and heavy rainfall all posed significant challenges. «To ensure long-term reliability,» says Molin, «we adopted a series of specific measures — protected cable routes, ducting systems to minimize exposure to moisture, barriers against torrential rain, watertight joints, custom mounting brackets for sloped areas, and dedicated inspection points to simplify maintenance.»

Special care was also given to selecting the optical boxes used at fiber junctions and terminations. In some cases, larger models — approximately 20×30 cm — were chosen



The ring network and the presence of two redundant OLTs guarantee strong reliability. In case of a fault, the switchover happens without the user perceiving it. This level of service is also "luxury," in an environment that aims to offer it 360 degrees.

common areas served in that zone.»

- The remaining fibers that continue along the ring are reconnected using optical patch cords — short fiber segments that restore cable continuity. «In this way,» Molin explains, «the splitter draws the signal needed for its zone, but the ring itself continues unbroken toward the next areas.»

to make installation easier for the local technicians.

«That's why,» Chiesa points out, «even distances that might seem relatively short on paper — such as the 400 meters between the data center and some parts of the lodge — become significant once you factor in the complex installation methods required by the terrain.»

Implemented services and Future-Proof of infrastructure - «As of today,» explains Chiesa, «the active services include: Wi-Fi connectivity not only in the guest rooms and common areas but also along the walkways and outdoor spaces, thanks to outdoor access points that extend coverage even into the forest surrounding the lodge; in-room telephony; on-demand entertainment and information content available via the guest tablets — including films, international newspapers, and lodge-specific materials such as restaurant menus; and a CCTV system for video surveillance».

When the time comes to add new features, expansion will be straightforward. «One of the key advantages of fiber optics,» Chiesa continues, «is precisely its future-proof nature — the network is ready to accommodate additional services, such as access control systems or smart automation, without requiring any structural changes.»

It's worth noting that although the available bandwidth is inevitably limited — around 60 Mbps — the network not only supports all the guest services listed above but also enables Fracarro to provide remote support for the facility, including real-time monitoring, remote diagnostics, and off-site maintenance capabilities.

Reliability and Redundancy Advantages - One of the main strengths of the GPON network built at the lodge is its outstanding reliability. As mentioned earlier, redundancy is ensured on two levels: passively, through the 12-core fiber backbone and the ring configuration of the network, and actively, via two OLTs configured as mutual backups — both equipped with dual power supplies.

«In detail,» explains Molin, «if one of the eight PON ports on an OLT stops working, the corresponding port on the second OLT immediately takes over. This means redundancy applies not just to the device as a whole, but to each individual port. The system switches automatically in a matter of milliseconds — if a guest is watching a video content, the interruption lasts less than a single video frame and is virtually unnoticeable.»

Another key advantage lies in the network's distribution layout. «Unlike a traditional setup,» Molin notes, «we didn't need to install intermediate racks or switches across the property. As a result, if an ONT fails, the issue affects only that specific room or area, without impacting any of the other guests.»

SATISFACTION WITH THE OUTCOME AND FRACARRO'S SUPPORT

Looking back at the completed project, Chiesa expresses great satisfaction with the remarkable results achieved in such a challenging environment. «We're the only ones offering this level of service,» he says. «In most lodges near the park, Wi-Fi — when it exists — is usually limited to the dining area. Guest rooms often lack even basic telephony or digital entertainment options like video on demand or online newspapers.» The competitive edge this infrastructure gives the Lodge is therefore undeniable.

The partnership with Fracarro is also remembered in highly positive terms. «From the design phase onward, the support was excellent,» says Chiesa. «Fracarro developed the GPON infrastructure quickly, with clear and transparent costs. During installation, they worked closely with us, always available and proactive — and the configuration of the devices was handled with real expertise.» ■

All Fracarro case studies on the Sistemi Integrati website

Video on the A&K YouTube channel: "Gorilla Forest Lodge, an A&K Sanctuary

> ***"The ring configuration guarantees continuity of service because, in case of a break on a section, the signal can still reach the served zones by passing through the other side [of the ring] - M. Molin***



The lounge at Gorilla Forest Lodge combines the refined, context-appropriate interior design with the comfort provided by the services enabled by the GPON network.