



WiBACK-SYSTEM

WiBACK SOFTWARE REL. 4

At a Glance

WiBACK is designed to deliver services with a high quality of experience (QoE). It efficiently bridges the gap between the Access for end-users and provider core networks. Sophisticated algorithms dynamically orchestrate the entire backhaul network with respect to spectrum allocation, topology management and load distribution, thus minimizing the need for highly skilled personnel. Compared to traditional fixed wireless operator backhaul technologies, those key WiBACK features lead to significantly lower setup (CAPEX) and operational costs (OPEX).

Developed by Fraunhofer, WiBACK technology offers a flexible, self-managing and cost efficient solution to provide carrier-grade wireless backhauling.

WiBACK Components

A typical WiBACK Network consists of only two types of electronical equipment keeping the system simple. A network requires one Network Controller located at the root of the network and the outdoor

WiBACK nodes which handle forwarding and provide connectivity at their location.

Key Features

- Plug & Play directional radio technology delivering low-cost broadband connectivity
- Self-configuration, -optimization and -healing
- Builds upon COTS hardware (BoM available)
- Supports heterogeneous technologies (e.g. IEEE802.11, micro-wave, satellite, fiber)
- Web based network visualization, monitoring and configuration
- Seamless integration into existing networks
- Small energy footprint (solar powered nodes)
- Provides carrier-grade services (e.g. QoS-enforcement, overbooking)
- Supports multi-tenancy allowing multiple operators to share the same physical network resources
- Forms redundant topologies ('rings') to increase resilience or capacity

Fraunhofer Institute for Applied
Information Technology FIT
Schloss Birlinghoven
53754 Sankt Augustin, Germany

info@wiback.org
www.wiback.org

For Everyone. Everywhere

Cost Efficient

High Performance

Pug & Play System

Low CAPEX / OPEX

Proven Concepts



- ✓ Auto Configuration
- ✓ Non-Expert Setup/Operation
- ✓ 10 Hops up to 200 km Range

- ✓ Little Manual Maintenance
- ✓ Low Power (Solar-ready)
- ✓ Off-the-shelf Hardware

- ✓ Reliability & Quick Recovery
- ✓ Carrier-Grade QoS, SLAs
- ✓ VoIP, HD-Video, Data, ...

Utilizing WiBACK – Connect the Unconnected

Everywhere

People in low income regions are still often denied the many benefits of broadband access, creating a digital divide. Directional radio systems allow to efficiently connect rural areas, reaching the local population, institutions and businesses.

Hospitals, schools, cellphone-towers, factories, government-buildings, sensors (security cameras, emergency sensors) and others.

By Everyone

WiBACK significantly reduces the complexity and effort required to set up and run such a network! Little skilled labor or specific technological expertise is required in the field. Therefore actors apart from the big operators are enabled to tackle this problem directly and to bring broadband Internet to where it is needed.

Municipalities, organizations, companies, hospitals, schools, local operators, local population – allowing them to take matters into their own hands instead of being reliant on the big operators and their schedules and business cases.

WiBACK Facts

Management Capabilities

- Self Management** Network is set up automatically, running within minutes after hardware is powered. No expertise required from users; auto adaption of frequencies, paths, bandwidths.
- Self Healing** Fast re-routing along fallback-links and self-configuration of links.
- Maintenance** Monitoring and auto-alerting, simple replacement of parts or extension of network (only plug-in of new node required).

Quality of Services

- Routing, Capacity Mgmt.** Transparent ethernet bridging incl. VLAN trunking and MPLS-based traffic engineering.
- Network Slicing** Multi-tenancy operation supporting different QoS-allocation models.
- Monitoring** Path auto-alert, monitoring and setup page accessible via web.

Cost Efficiency / Flexibility

- Hardware** Utilization of commercial off the shelf (COTS) hardware. Local assembly possible (BoM available), low energy footprint (solar-ready), only two main components (controller + WiBACK nodes).
- Physical Layer** Wireless links in unlicensed (WiFi) and licensed spectrum (e.g. TVWS, public safety bands); can integrate wireline infrastructure into network.

Technical Capabilities (using IEEE 802.11ac radios)

- Bandwidth** < 200/400 Mbps (40/80Mhz channel)
- Latency** < 2 ms (per link)
- Distances** < 20 km (per link)

Enable Crucial Services

Services

High speed connectivity, health services (e.g. general information, consultation of doctors via video conference, order/check availability of medicine), education, governmental services (ID, administration), communication (email, VoIP services), and many more at significantly lower costs than via mobile networks.

Access

Directly at a specific organization's site, or via any access solution (cellular or commercial off the shelf access points) in a simple plug and play mode.



WiBACK Controller available as Mini-PC, virtualized entity and rack-mounted (1U).



Outdoor WiBACK node (available with 2, 3 and 4 Antennas, see data sheets).