

IQ wireless **Internet Access Point (IAP)**



Next Generation Wireless Access System
as Integrated Wideband Platform
for Internet and Telephone Services



Communications – an elementary necessity of people and a supposition for their

It's impossible not to communicate!

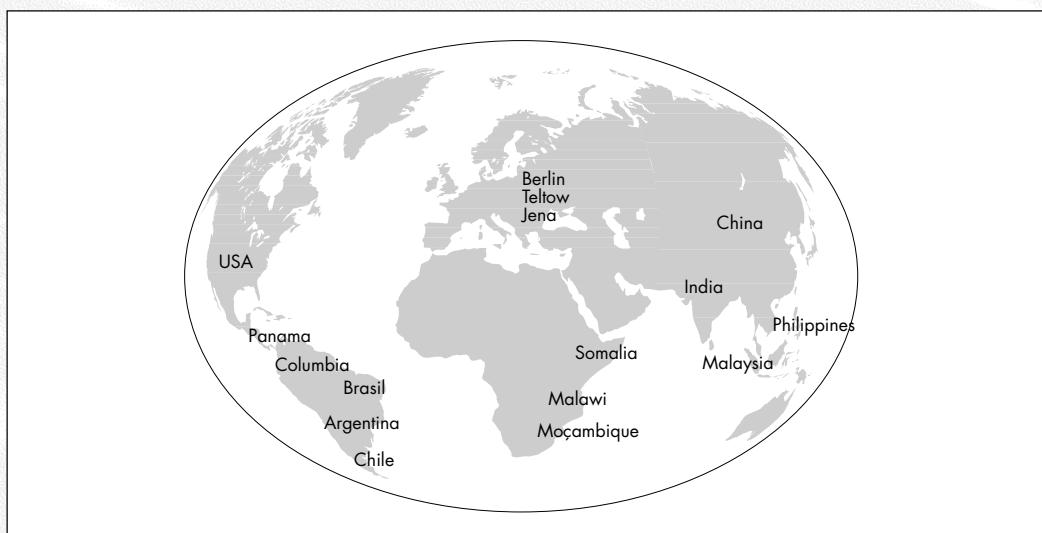
economic action – is very restricted in their possibilities in large parts of the world.

All of us need communication!

Modern communication offers the chance to communicate with the whole world.

Provide us the possibilities!

But how to use it, if the life-conditions bar the way to telephone and internet?



IQ wireless – a worldwide leader in the development of wireless local loop solutions!



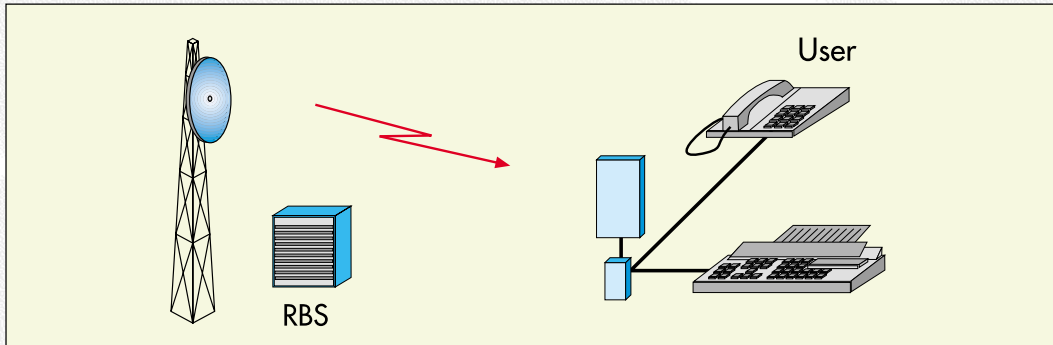
- **Wireless Internet and Phone Access**
- **Wide Coverage Range**
- **High Data Transmission Rate**
- **Large Number of Customers**
- **Fast Installation Time**
- **Low Operating Costs**
- **Highest Frequency Efficiency**



Today's WLL Technology



Wireless Circuit Switched Network (1)

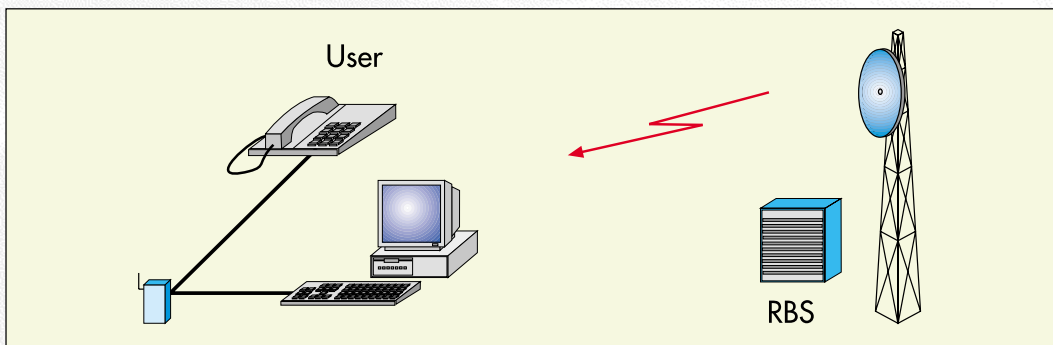


Advantages: Quality of service is guaranteed

Drawbacks: Bandwidth allocation requires a large capacity of the air interface

Applications: Constant bitrate services (POTS)

Wireless Packet Data Network (2)



Advantages: Effective handling of variable bitrate services

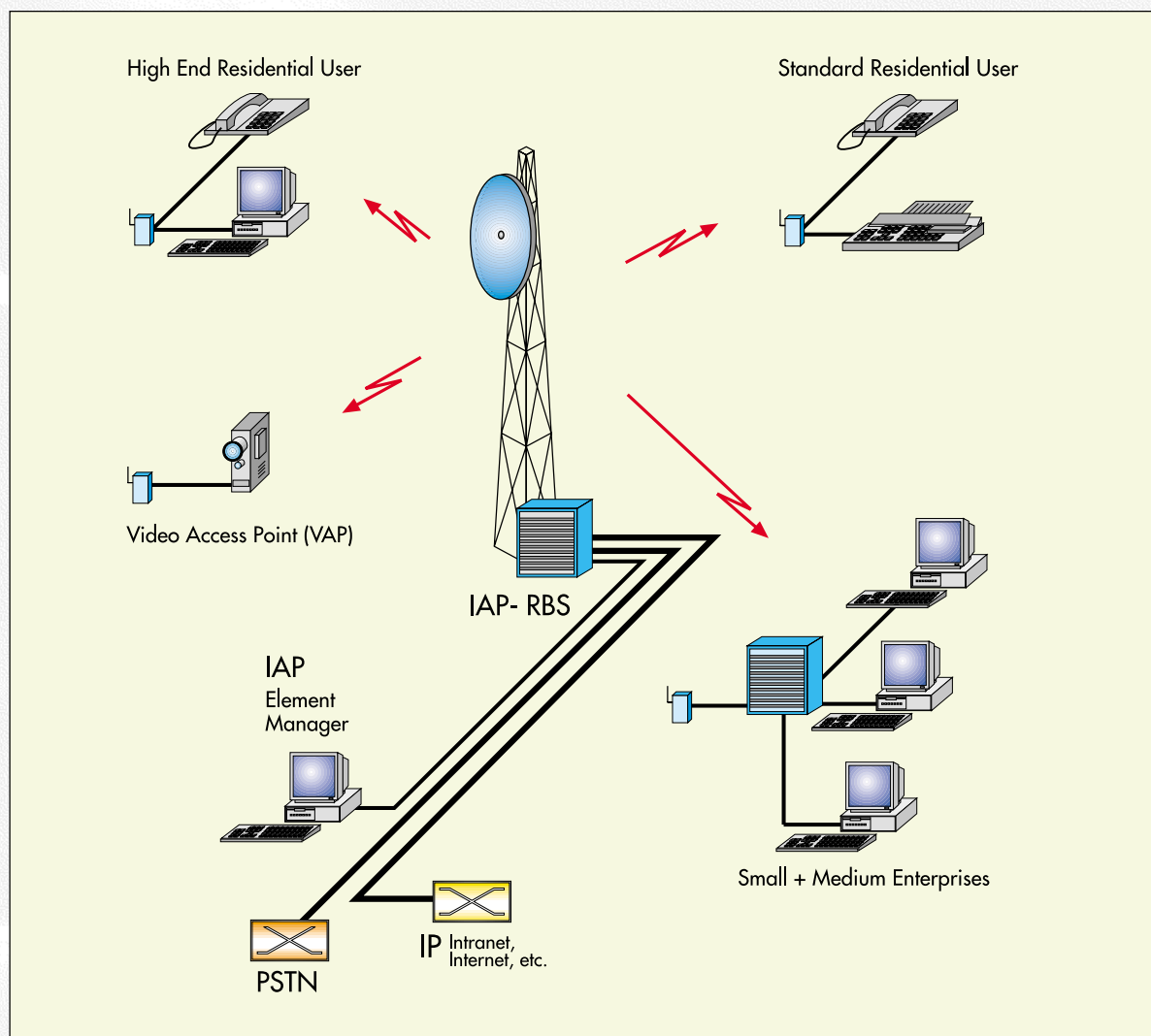
Drawbacks: Poor quality of service for constant bitrate services (voice, video)

Applications: Computer networks (internet access, WLAN)



IAP – Next Generation WLL & WIA Solution (3)

IAP – a brand new technology, developed by **IQ wireless** is the next generation radio system,



which combines Wireless Internet Access (WIA) and traditional telecommunication services like POTS and ISDN to an Integrated Wideband Services Platform





IQ wireless **Internet Access Point (IAP)**

Wireless Local Loop is the replacement of the traditional copper cable to the customer's premises by a radio link.

Important key features which favore Wireless Local Loop over conventional cable are:

- fast installation time,
- cost independent of the length of the subscriber loop,
- fast return-of-investment,
- dedicated investment where real subscribers are,
- controlled growth of the network and the required investment costs,
- good installation opportunities also in heavy terrain

Whether you are a new network operator or you plan a green field development, resp.: **WLL equipment should be regarded first.**

IQ Wireless Internet Access Point delivers a **next generation integrated wideband services platform for urban and nonurban areas.**

It is your best network operator's choice if you agree to the following items:

- You are looking for a system supporting **IP traffic** and **POTS+** up to **wideband**

services on high quality communication links,

- You are looking for a **high capacity system** offering **enhanced spectral efficiency** and best overall economy,
- You are looking for a **low-cost-system** which is also future proof and extendable in services
- You are looking for an **easy-to-grow-up system** which is scalable in traffic and features,
- You are looking for a system that fits your requirements in **large rural areas** as well as in **suburbs**,
- You are looking for **reliable** technology and **state-of-the-art** design,
- You are looking for an equipment with low power consumption and compact size,
- You are looking for an easy-to-operate--system with powerful network management capabilities,
- You are looking for a customized solution in frequency bands, special features and configurations to prices of a standard solution,
- You are going to participate and rely on **10 years of experience** in developing, manufacturing, installing and operating WLL equipment,
- You are looking for a WLL system whereas your telephone customers do not remark that.



Technical Highlights:

- **Fast IP based Internet access** up to **4 Mbit/s** per subscriber (full duplex)
- **High Quality Voice** with ISDN-like feature and **G3-Fax / V.90 Modem** services
- **Always Online** – no modem call set-up needed before each Internet session
- **High system bandwidth and capacity:**
Up to 1,080 simultaneous calls = 10,000 subscribers per radio base station site
- Cell coverage up to **50 km** radius
- **High frequency flexibility and economy:**
any **5 MHz** within **400 MHz - 4 GHz**
- State-of-the-art **W-CDMA Air Interface**
- **Integrated Gateway** functionality, base station with Ethernet and PSTN interface
- Professional **SNMP**-based management system for efficient maintenance





Short Description

The **IQ wireless** IAP System is a full digital wireless system with integrated data and voice transmission capabilities.

By interfacing IAP system to a local exchange or data network via routers/gateways it allows a flexible dynamic resource allocation to support various numbers of subscribers in the most efficient manner and giving them standard data or telecom interfaces.

The subscriber units have a 100/10BaseT interface to allow LAN (local area network) and direct internet access.

Additionally, all subscriber units are supporting POTS+ via a standard tip/ring interface enabling high quality voice services and voiceband data communications (G3 fax, V.90 modem). Due to a transparent voice-channel all these voiceband data services are equivalent to wireline quality. All services and features well known from the wireline world can be supported, e.g. charging pulses, value added services and others.

Enhanced versions of the subscriber units are supporting bandwidth-on-demand for data services up to 4 Mbit/s per subscriber via a 100/10BaseT Ethernet interface whereas the basic version enables data services up to 128 kbit/s.

Additionally, multi subscriber units are available which are delivering POTS+ and data services for up to 4 subscribers simultaneously.

Due to an open architecture and concept, future wideband extensions are possible.



The highlights and most advanced features of IAP system are:

- Very robust W-CDMA air interface and interference rejection based on an advanced system design,
- Capacities, Services and Bit-Error-Rates optimized for fixed applications which lead to much better parameters than all other existing wireless systems,
- Best overall efficiency and lowest cost systems.

The **IQ wireless** IAP system consists of the following **components**:

- The IAP base station which has interfaces to a local exchange or internet service provider, an interface for network management purposes, a main controller and a RF unit to terminate the air interface.
- The IAP terminal station (subscriber station) which has the RF termination of the air interface and delivers standard telecom or data interfaces (e.g. tip/ring, 100/10BaseT) at the customer premises site.
- The IAP network management interface which allows for remote control, configuration, administration, alerting, testing and trouble shooting of all network elements.



Technical specification:

Interfaces

IAP base station:
Interfaces to local exchange and other operators:



- Up to 6 E1 interfaces with PCM 2-Mbit/s according to ITU G.703
- Protocol ETSI V5.2
- 100/10BaseT interface to an IP based bridge or router

Other interfaces upon request via internal or external protocol converters and multiplexers, e.g.:

- MFC R2, ETSI V5.1, tip/ring and other

Interface to network management:

- SNMP
(configuration management, fault management, performance management, security management, billing management)

IAP terminal station

- 100/10BaseT
- Tip/ring

other interfaces upon request





Services and Capacities:

- IP traffic with bandwidth on demand up to 4 Mbit/s full duplex per remote station at a compression rate of 2:1 (basic version up to 128 kbit/s)
- Enhanced POTS+ (voice service with 8 kbit/s toll quality coding according to G.729, fax service G.3 up to 14.4 kbit/s, voice band modems V.90 up to 56 kbit/s)
- Bit error rate voice services 10^{-4} , Bit error rate data services 10^{-6}
- Overall capacity up to 160 Erlang per sector at 1% blocking/voice services
- Maximum number of subscribers per sector: 4,000
- Maximum number of sectors per site: 6 (=1,080 simultaneous calls)
- Other services on request

Air interface:

- Modulation and access technology: W-CDMA with QPSK
- Bandwidth/Channel spacing: 5 MHz (Chiprate 3.84 Mchip/s, roll-off-factor 0.22)
- Duplexmode: TDD (FDD on demand)
- Output power: 19 dBm per code channel (base station), 21 dBm per code channel (terminal station)
- Frequency bands: any 5 MHz in 400 MHz...4 GHz (on demand)
- Frequency reuse factor/cluster size: 1 ... 3
- Range/Link budget: up to 50 km

Power supply:

- 48V (base station), battery backup on demand, mains optional
- 12V (terminal station) via plug-in power supply from mains, batterie backup on demand

Temperature range:

- base station according to IEC 721-3-3 Set IE35, indoor -5°C ... $+45^{\circ}\text{C}$
- terminal station according to IEC 721-3-3 Set IE35, indoor -5°C ... $+45^{\circ}\text{C}$ (optional -25°C ... $+55^{\circ}\text{C}$)
- antennas and feeders for out-door installation

Cabinets:

- 19" rack (base station)
- Proprietary (terminal station)



IAP Networkmanagement

The central management software tool together with the host is called the IAP Element Manager. Herein, all informations delivered by the IAP system and/or other systems to be controlled are combined and evaluated.

The IAP Element Manager contains an interface to a superior Network Management System. This allows to watch determined parameters which are important for the main functionality and to receive alarms via SNMP traps.

Functionality of the IAP Element Manager

The software tools of the IAP Element manager are offering the following functionality:

- Configuration Management to parameterize and configure all components of the IAP system, e.g. radio base station, switching unit, subscriber unit.
- Security Management to guarantee only authorized access to the IAP components and to the administration system.
- Fault Management to detect an insufficient operation of the system and to allow for testing, trouble shooting and alerting. It is possible to check all active components, subscriber units included.
- Performance Management to detect, store and visualize actual global traffic and service parameters of the system.
- Billing Management to provide a network operator with individual traffic and service per subscriber parameters.



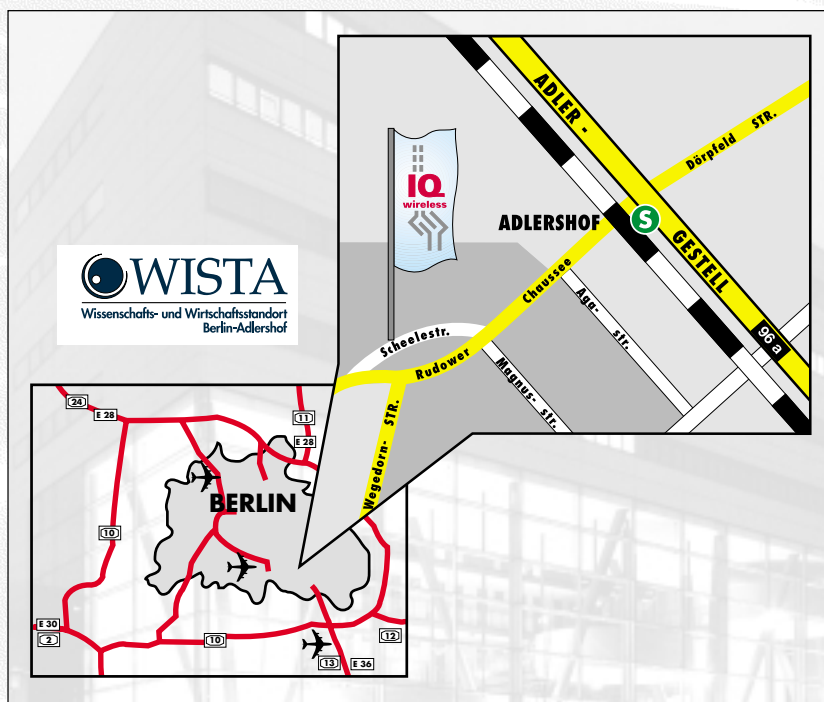
Management Protocol

The Simple Network Management Protocol (SNMP) delivers a unique protocol platform which allows for managing the resources of the IAP system within the telecommunication or data network of a service provider via a packet oriented connection.

The SNMP model consists of the following components:

- A **Host** which is also called the manager based on a high performance hardware platform with large memories (RAM, disc capacities and back-up facilities) and a high resolution graphic device and monitor.
- An **Agent** which controls the interaction between the central IAP Element Manager and the local resources. This agent is an integrated part of the IAP system.
- The **MIB** (Management Information Base) is a description of all managed objects within the IAP system and contains actual information of these objects managed.





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