

A  
Seminar report  
On

## Wireless local loop

Submitted in partial fulfillment of the requirement for the award of degree  
Of Electronics

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## Preface

I have made this report file on the topic **wireless local loop**, I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to .....who assisting me throughout the prepration of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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## INTRODUCTION

- In the telephone networks, the circuit between the subscriber's equipment (e.g. telephone set) and the local exchange is called the subscriber loop or local loop.
- Copper wire has been used as the medium for local loop to provide voice and voice-band data services.
- Since 1980s, the demand for communications services has increased explosively. There has been a great need for the basic telephone service, i.e. the plain old telephone service (POTS) in developing countries.
- Wireless local loop provides two-ways a telephone system.....
- Wireless local loop includes cordless access system, proprietary fixed radio access system and fixed cellular system. It is also known as fixed radio wireless. This can be in an office or home.
- Broadband Wireless Access (BWA), Radio In The Loop (RITL), Fixed-Radio Access (FRA) and Fixed Wireless Access (FWA).

## **What is a wireless local loop?**

In a telephone network, a wireless local loop (WLL) is a generic term for an access system that uses a wireless link to connect subscribers to their local exchange in place of conventional copper cable. Using a wireless link shortens the construction period and also reduces installation and operating costs.

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## **History of WLL**

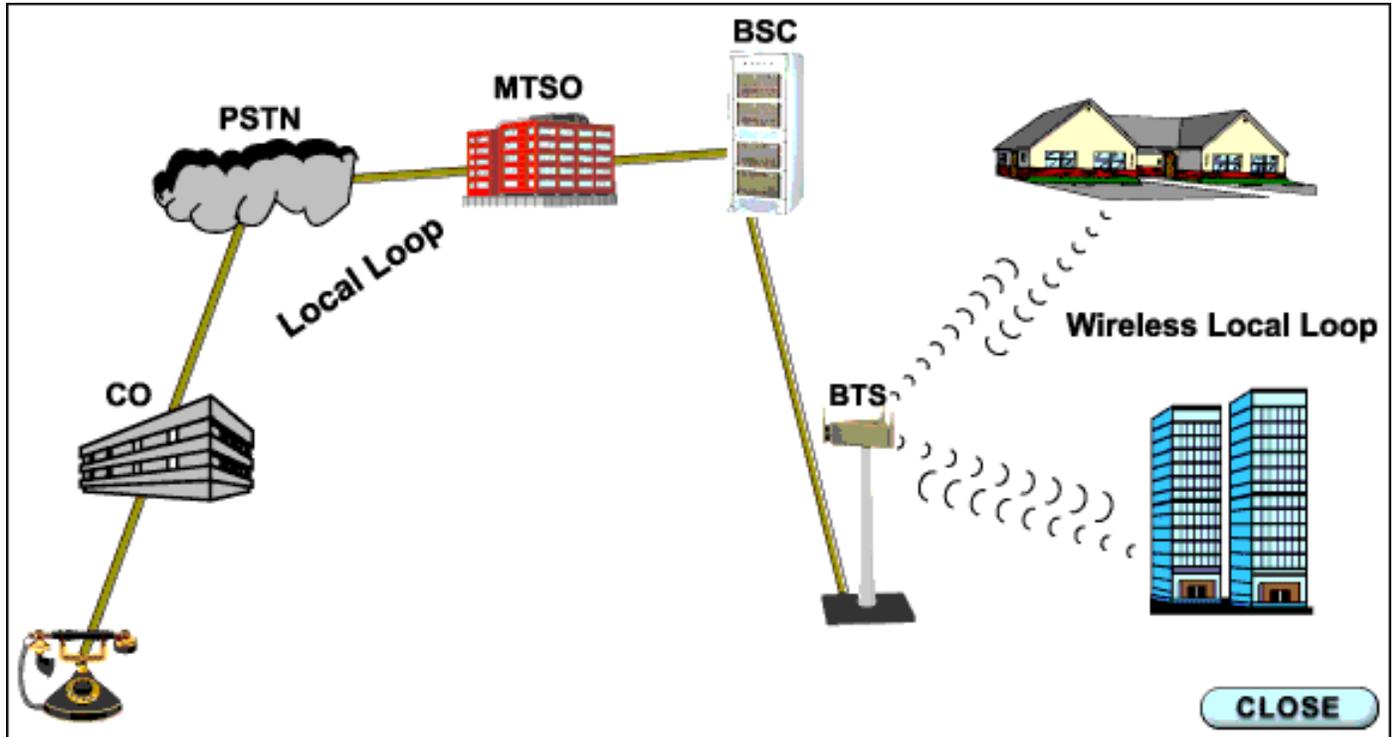
Wireless access first started to become a possibility in the 1950s and 1960s as simple radio technology reduced in price. For some remote communities in isolated parts of the country, the most effective manner of providing communication was to provide a radio, kept in a central part of the community. By the end of the 1970s, communities linked by radio often had dedicated radio links to each house, the links connected into the switch such that they were used in the same manner as normal twisted-pair links. The widespread deployment of the cellular base station into switching sites helped with cost reduction. Similar access using point-to-point microwave links still continues to be widely used today.

During the reunification of West and East Germany, much funding was put into increasing the teledensity in East Germany. The installation of twisted-pair access throughout would have been a slow process. In the interim, cellular radio was seen to offer a stop-gap measure to provide rapid telecommunications capability. So in East Germany a number of cellular networks, based upon the analog Nordic Mobile Telephone (NMT) standard, were deployed in the 800 MHz frequency range. The key difference was that subscribers had fixed unit mounted to the sides of their houses to increase the signal strength and hence allow the networks to be constructed with larger cells for lower costs. Thus, we see the first WLL network was born.

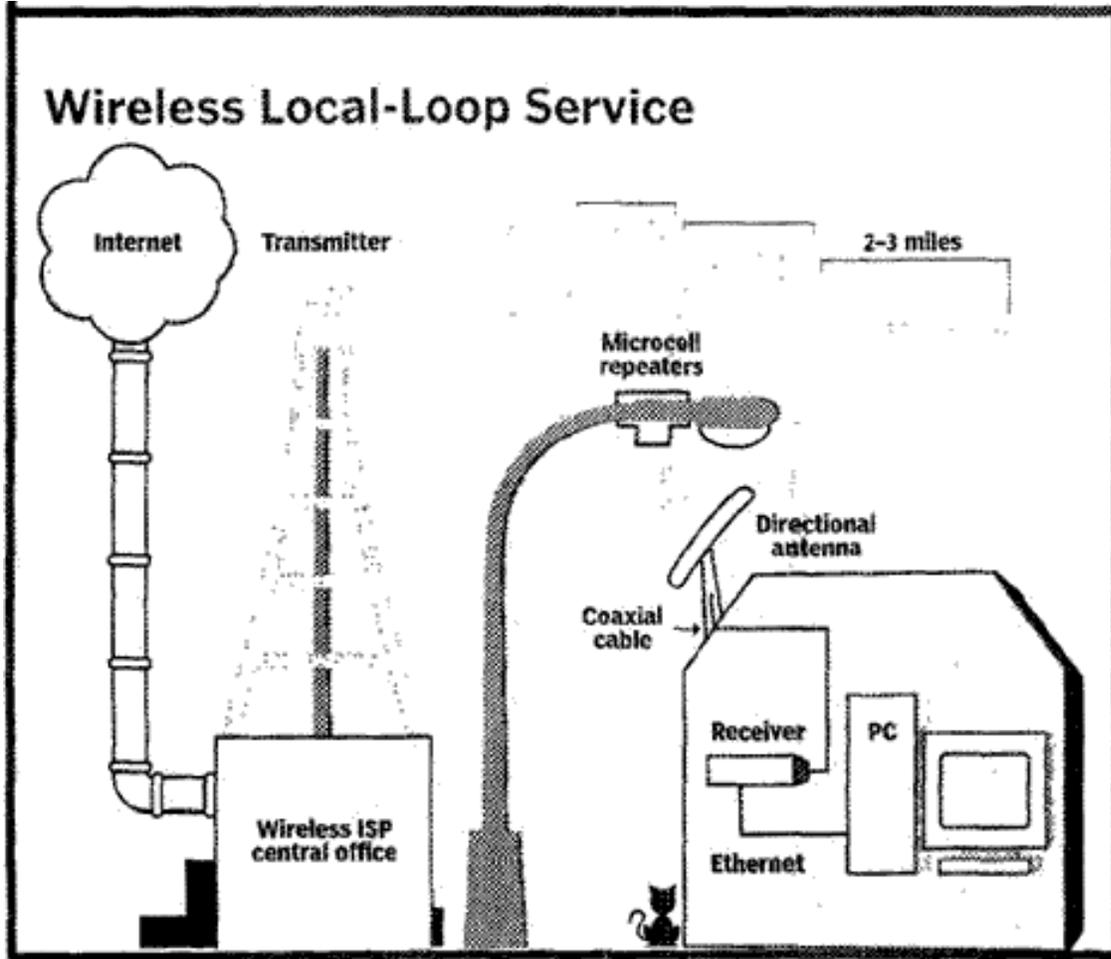
### **How does WLL work?**

WLL, which stands for Wireless Local Loop is of course a technology that connects subscribers to the PSTN using radio signals as a substitute for copper for all or part of the connection between the subscriber and the switch. This includes cordless access systems, proprietary fixed radio access, and fixed cellular systems. WLL phones in homes, offices or even boats connect with a wireless system in a manner similar to that of CDMA cell phones.

The difference is that WLL phones usually stay in a relatively fixed location. WLL phones often connect to AC current rather than using batteries. They are used to provide voice, fax, and data connections. The diagram below shows how the subscriber unit conveys digital signal through RF to the base station (RBS or BTS), which has a landline to the BSC and then back to the main switch office. This has in turn its own connection to the PSTN and hence to other subscribers.



Using WLL for data transfer applications rather than using cable or DSL is also becoming a viable option because of the low setup costs of WLL. Below is a diagram of the WLL used in computer data transfers. However price per month for subscribers is another matter. In 2001 a typical contract can run upwards of \$100 a month for a 1 Mbps service. This is on top of the \$1500 connection fee. However if the only other choice is no broadband at all, WLL may look much more attractive



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## **WLL VS WIRELINE SYSTEM**

- Concentration of Resources
- Flexibility to planning and deployment of the system
- Fast network deployment and change
- Lower maintenance and capital costs
- Local mobile feature
- Temporary Installation

### **Advantages**

**In comparison to the alternative of deploying copper lines, WLL technology offers a number of key advantages:**

- **Faster deployment:**

WLL systems can be deployed in weeks or months as compared to the months or years need for the deployment of aboveground or underground copper wire. Even with higher costs per subscriber that may be associated with the WLL terminal and base station equipment, the faster rate of deployment can permit a higher return on investment.

- **Lower deployment costs:**

The deployment of WLL technology involves considerably less heavy construction than does the laying of copper lines. The lower construction costs may be more than offset by the additional equipment costs associated with WLL technology, but, in urban areas especially, the process of routing cable to individual households is also much more time consuming than deploying wireless base stations, which are shared by many subscribers. Wireline networks also take more time to deploy than WLL networks because they require government right of way authorization to dig trenches through public streets.

- **Lower network maintenance, management, and operating costs:**

Especially in areas where the deployment of copper lines has the potential to be haphazardly performed, wireless equipment can be less failure prone than copper wire and can be less vulnerable to sabotage, theft, or damage due to the elements or other parties. In some WLL systems, network management, including fault-finding and system reconfiguration, can be conducted from a centralized location to fully administer the WLL network between the telephone network interface and the subscriber terminal. The overall result is reduced lifetime network costs.

- **Lower network extension costs:**

Wireless local loop technology intrinsically offers flexibility to meet uncertain levels of penetration and subscriber growth rates. Once the WLL infrastructure is in place, each incremental subscriber can be installed at very little cost. WLL systems that are designed to be modular and scalable can furthermore allow the pace of network deployment to closely match demand, minimizing the costs associated with underutilized plant. Such systems are flexible enough to meet uncertain levels of penetration and rates of growth.

- **High bandwidth is available providing:**

- Video;
- High-speed Internet access; and
- Telephony services.

## Disadvantages

- **The technology is more costly due to the need for research and development**

Moreover, some network operators fear technological obsolescence, that if a commitment is made to a specific WLL technology today, then within a few years it may be surpassed by technologies currently under development.

- **The technology has not been tested over a long term of time for reliability and repair costs**

The disadvantages of a wireless local loop solution, lie in the fact that much of the technology particularly on the digital side, is relatively untried.

- **Certain technologies are not available in all areas, which leaves people with the unsupported technology disconnected**

The capital cost of WLL technology, even when it compares favorably to the deployment of copper lines, remains outside the reach of many government or private network operators.

- **Wireless technology requires that data be sent over open space, which makes it susceptible to interception and decreases the security of the transmission**
- **Customer accessibility is still low in the US**

Where traditionally most of the innovations in new technology comes from.

- **Market investment is slow in the US**

Due to the low penetration of American companies in the market.

## **CONCLUSION**

- High capacity for voice channels and quick start of services.
- WLL will play a more important role for local loop services in future.

**References**

[www.studymafia.org](http://www.studymafia.org)

[www.wikipedia.com](http://www.wikipedia.com)

[www.google.com](http://www.google.com)

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