



## The Telecommunications Situation

Today's trend in telecommunications is migration – from wireline to wireless, from narrowband to broadband, and from circuit-switched to packet-switched networks.

The reason is that traditional Legacy networks are limited by a rigid, TDM-based structure and a proprietary platform. This is because Legacy networks were designed for voice service and little else.

Operators need a cost-effective, seamless network migration strategy that:

- ❑ preserves physical infrastructure and existing service offerings
- ❑ supports new, revenue-generating services
- ❑ provides a pay-as-you-grow investment
- ❑ protects their investment
- ❑ expands their customer base in an increasingly competitive environment

Operators are seeking a next-generation solution that meets the networking needs of tomorrow – today.

## The PAS Solution

UTStarcom's PAS™ (Personal Access System) provides that solution. PAS is a Wireless Access Network that ingeniously transforms existing copper networks into high capacity wireless networks.

PAS delivers wireless, mobile voice and data services within a city or community of up to several hundred thousand subscribers at traffic densities upwards of 15,000 subscribers per square kilometer. The system seamlessly integrates into the existing PSTN via the V5.2 or SS7 interface, allowing service providers to take advantage of unused switching capacity to extend existing services to a new customer category — wireless subscribers.

With PAS, service providers can quickly and cost-effectively build out their wireless access network – while also offering new wireless voice and data services that would not be possible with a traditional wireline network.

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PAS delivers:

- ❑ fast, low-cost migration from wired to wireless service
- ❑ voice and data access with citywide and inter-city mobility
- ❑ rapid revenue generation through the ability to offer new services
- ❑ enhanced competitiveness

## **PAS Success in China**

Driven by robust economic growth, escalating consumer demand, and the government's commitment to an advanced infrastructure, China has evolved into one of the world's most promising telecommunications markets. The Chinese government has invested roughly \$20 billion annually in technology to serve what they anticipate to be 600 million users by 2005.

With a population of 1.3 billion and telephone teledensity of less than 20%, China represents an enormous opportunity that is only expected to grow as competition increases. Although voice service is in highest demand, the market for Internet service is also expected to grow rapidly. Furthermore, upon China's acceptance into the World Trade Organization (WTO), more capital will become available to invest in telecom infrastructure.

In 2000, an astonishing 60 million new wireline and wireless lines were installed. Subscribers of fixed-line telephones now number over 100 million in China.

PAS is capitalizing on this growth by extending the fixed-line telephone, offering mobile communication through the use of existing infrastructure. As a result, PAS is meeting the demand for both voice and data services in China.

For the conventional voice market, PAS offers mobility without the complicated cross-area management required by mobile phones. PAS also makes efficient use of the existing fixed telephone network resources, helping to raise connection rates and increase efficiency.

For the Wireless Internet market, PAS is providing highly desired Internet access at transmission speeds faster than those of GSM systems or even many wired connections.

Market analysis indicates that about 85% of fixed line subscribers in China spend 85% of their time mobile within the range of a local network. A high-quality, low-cost tool such as PAS addresses this market by providing voice and data services to users who are on the move.

So far, over 3.5 million PAS lines have been installed in 130 Chinese cities. As of March, 2001, there were 1.35 million subscribers enjoying the many advantages of PAS in China.

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Estimates indicate that PAS subscribers will total 20 million by 2002 – and up to 50 million by 2005. The ever-increasing demand for Internet access may well drive these numbers even higher.

## **What are the Advantages of PAS?**

PAS uses existing infrastructure to offer low-cost, high-quality voice and data access within a defined geographic range. A wide variety of benefits result.

### **Fast Service Provisioning**

Service providers can quickly build out their wireless access network in just 3 to 5 months, bypassing the lengthy process of installing copper infrastructure. Services can be instantly deployed to meet operator and subscriber requirements. The system's dynamic channel allocation feature enables easy network expansion as demand grows.

### **Low Investment**

Because it utilizes existing infrastructure, PAS requires a low initial investment. There is no need to build a costly wireline network.

### **New Revenue-Generating Services**

PAS supports a broad range of new, revenue-generating services, including:

- ❑ **Wireless CityPhone** — Provides same-number extension line or second line with citywide mobility. Subscribers benefit from personal access via the compact, digital pocket phone and one-number, citywide mobility. Service providers benefit from the simplicity and low cost of re-using local exchange switches.
- ❑ **Business communication** — Deployed in business offices, industrial complexes, shopping malls and university campuses to provide access to people who are constantly on the move and need to be reached at all times
- ❑ **Mobile Internet access** — Provides high-speed access to the Internet anytime, anywhere at 32 Kb/s or 64 Kb/s (user rate is 29.2 kbps or 58.4 kbps)
- ❑ **C-Mode services** – Provides instant information services such as news, stock quotes, local events, instant messages and email
- ❑ **Short Message Service** — Allows subscribers to send and receive text messages among PAS or GSM subscribers
- ❑ **Location-based information services** — Enables subscribers to use their handset to conveniently access information such as nearby restaurants, shops, hotels, theaters, etc. PAS can even be used to track a subscriber's current location in the event of an emergency.

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## **Future Readiness**

PAS offers easy migration to broadband and 3G services.

## **What Services does PAS Provide?**

### **Basic Voice**

- Wireless CityPhone
- Intra-City Roaming
- Inter-City Roaming
- Fixed WLL
- Pre-paid service
- Calls to/from PSTN
- National Long Distance Call
- International Call

### **Information Services**

- Mobile Internet Access at 32/64 Kb/s
- E-Mail Service
- Short Message Service
- Location Trace Service
- Information on Demand
- Download Service (MP3, Games, etc..)
- PDA Handset (future)

### **Supplementary Voice**

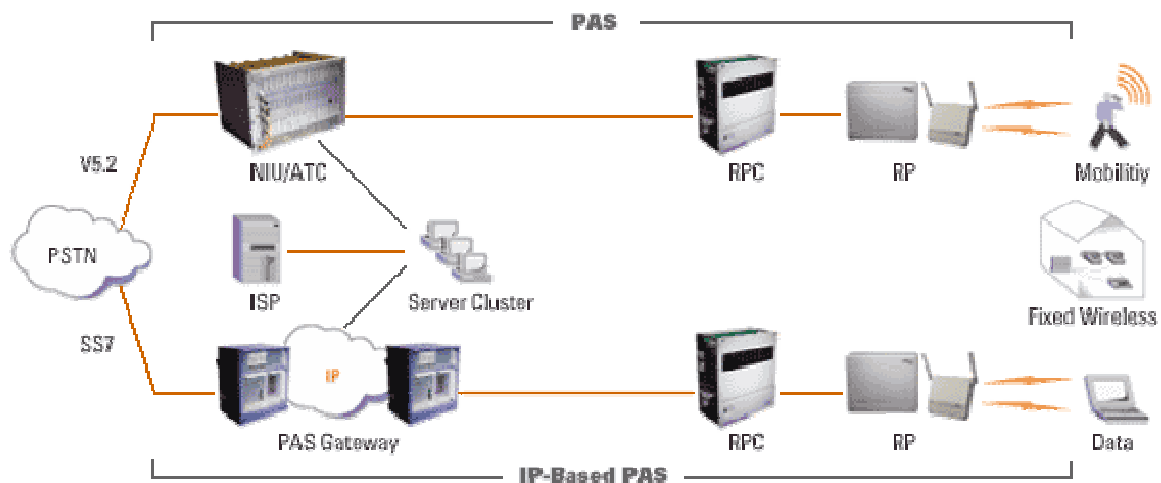
- Voice Mail
- Caller ID
- Call Forwarding
- Call Transfer
- Call Waiting
- Call Barring
- Call Conferencing
- Hot Line
- Malicious Call Trace
- Virtual Mobile PBX
- Videophone (future) Why is this labeled “future” ?

## The PAS Telephone

PAS subscribers use a special telephone to receive and dial local, domestic and international calls. This telephone may carry the same “shared code number” as the fixed telephone, or may have a different number if requested. Calling charges on PAS are very close to those of fixed-line charges. The telephone has an 800-hour standby, or 6.5 hour talk-time.

The PAS telephone makes full use of existing telephone switches for switching and billing. It transparently supports services supplied by the local telephone switches, such as wired and wireless integrated service access, call forwarding, calling number display, fax, etc. PAS enables fixed-line telephones to realize mobile communication.

## PAS Architecture

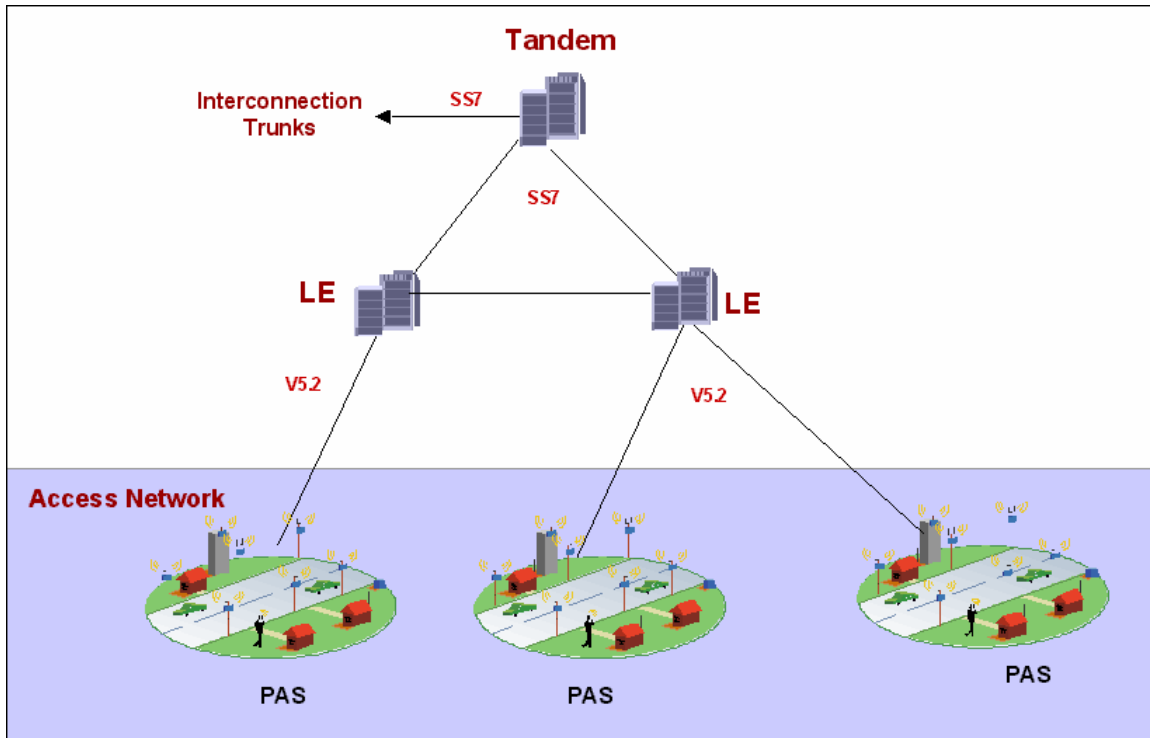


## Configurable Architecture

PAS was designed with an open architecture that interconnects with existing PSTN in two main configurations at either the V5 or SS7 interface. Elements include:

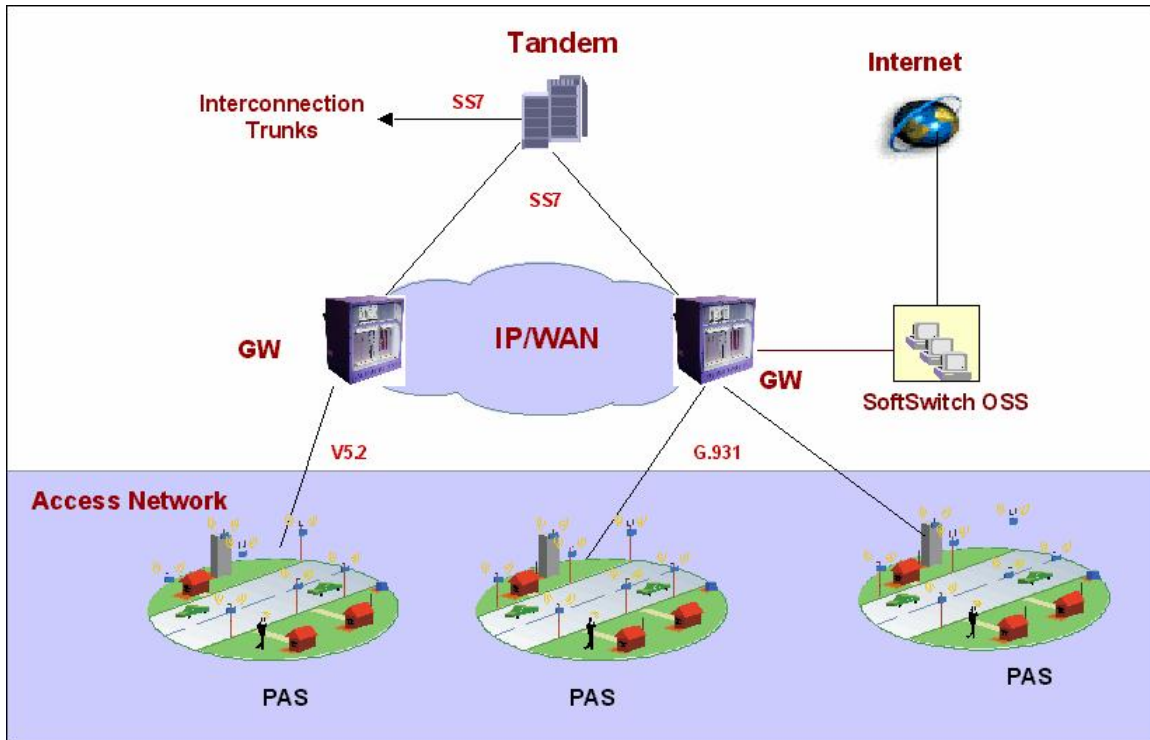
## V5 Interface

PAS connects to the existing local exchange switch via the V5.1, V5.2 or analog interface using the Network Interface Unit, so service providers can take full advantage of unused capacity and existing services such as caller ID, call forwarding and voice mail.



## SS7 Interface

When combined with UTStarcom's WACOS IP-based switching platform, PAS can be deployed independently of the local switch and connect to the PSTN via the SS7 interface. This is ideal for large installation sites or for areas where the V5.2 interface is not yet available.



## Radio Base Stations

The Radio Port communicates with the subscriber terminals via the air interface, and relays the information via ordinary copper cables to the Radio Port Controller located at the wiring center.

## Server Cluster

The server cluster performs the following functions:

- subscriber authentication
- mobility and roaming management
- value-added services
- Internet access server
- subscriber management
- network configuration
- fault management
- accounting management
- customer self-care

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Based on an industry standard platform, the PAS server cluster can be scaled according to network capacity and service requirements.

### **Subscriber Equipment**

PAS offers three types of Customer terminals: A PAS handset or personal station for citywide mobility, a fixed subscriber unit for fixed wireless access and a PAS data suite for high-speed Internet access. PAS supports an environment of multi-vendor subscriber equipment.

### **Conclusion**

PAS meets the network migration needs of both today and tomorrow. It enables seamless migration to packet-switched technologies, supporting high-quality mobile voice and data access through the use of existing infrastructure. As a result, operators can remain competitive by offering new services at a low cost – while positioning themselves for the 3G and Broadband services of the future.