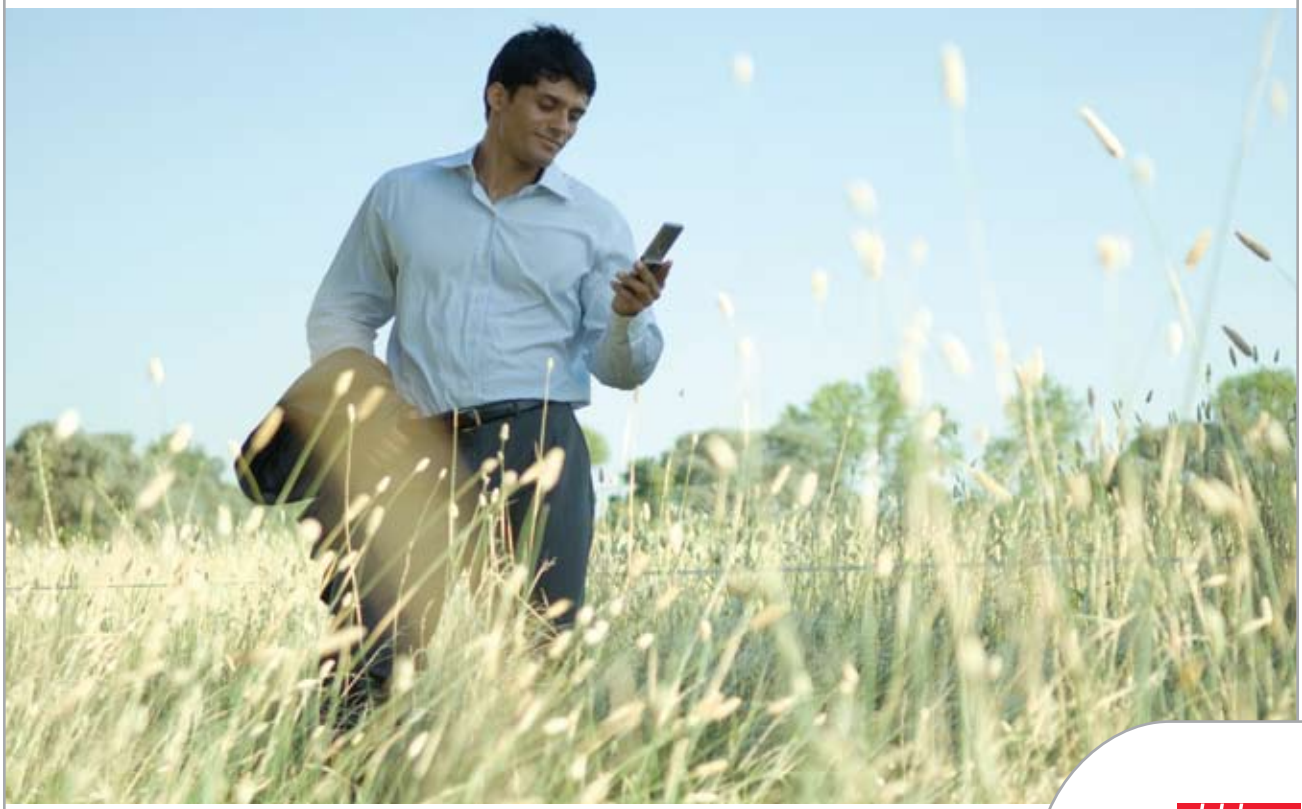
UltraWAVE CDMA

Next Generation CDMA 2000 Solution



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UltraWAVE CDMA, is a future proof, IP-based CDMA 2000 solution that provides wireless telephony and always-on data for mobile and fixed applications.

The system provides an optimal solution for small to medium scale networks in urban, suburban and rural areas. Its distinctive distributed IP architecture minimizes operators' initial investment and expedites time-to-market.

Product Highlights

UltraWAVE CDMA is a wireless solution that supports next generation networks (NGN) for mobile and fixed applications, based on the widely deployed CDMA 2000 standard. The system provides carrier-class telephony and always-on data for subscribers requiring fixed, limited or full mobility connections.

Minimizing initial network costs, its IP-based architecture, combined with a distributed structural design, makes the UltraWAVE CDMA an unmatched compact infrastructure solution. A full range of carrier-class telephony services ensures subscriber satisfaction by delivering high-quality voice and data services. Value added services (VAS) such as voicemail, pre-paid and SMS are supported. Always-on packet data up to 153 Kbps is also supported.

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Key Advantages

Low Total Cost of Ownership

- Reduces end-users' deployment costs using standard CPEs
- Lowers operating costs due to distributed and compact architecture
- Decreases network complexity through voice and data payload convergence
- Uses IP backhaul and off-the-shelf IP core network equipment

Optimal For Rural Deployments and Network Extensions

- Reduces number of cell sites due to wide coverage range
- Enables call termination within the local cell for reduced satellite backhaul costs

Minimal Initial Investment

Provides a scaleable 'pay-as-you-grow' expansion model due to its distributed architecture:

- Grows seamlessly from a self-contained network in a single rack to a nationwide, full-fledged distributed network
- Scales from a single carrier, omni directional base station into a high-capacity multicarrier, multi-sector cell

Deployment Flexibility

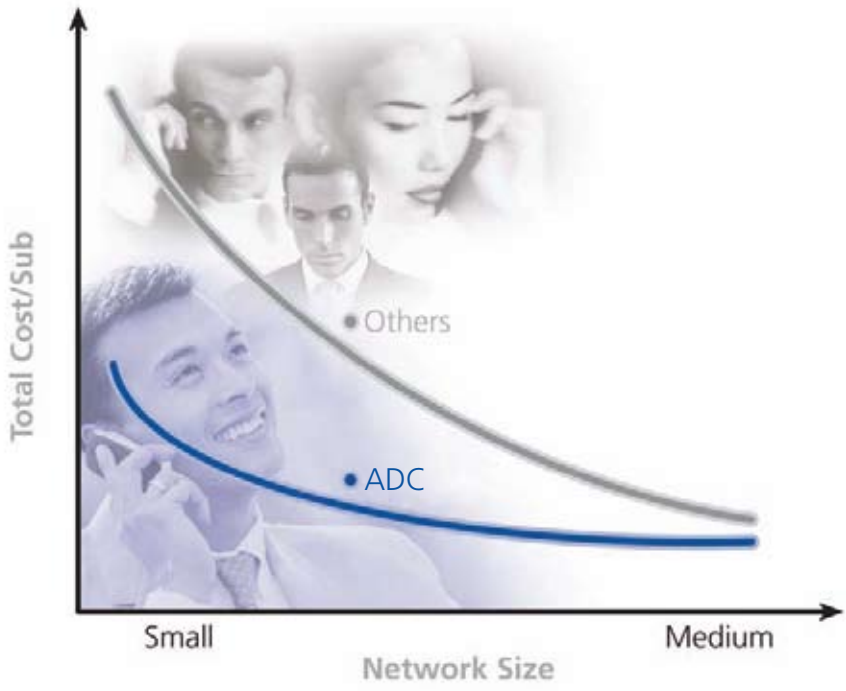
- Supports connection to PSTN over a variety of interfaces: V5.2, ISUP SS7 and ISDN PRI
- Enables rapid and optimized access for remote cells using both terrestrial and VSAT backhaul
- Enables both long range macro cells or pico indoor cells

Ready For Next Generation Networks (NGN)

- UltraWAVE CDMA aligns closely with the development of MMD, IMS and NGN networks. At the same time it offers seamless integration with legacy circuit switched networks via a Media Gateway
- Grants new operators a solution establishing an IP-based network architecture today
- Allows future migration from legacy networks as IP architecture enables the reuse of system building blocks

Future Proof Solution

- Supports easy migration from fixed to mobile services
- Allows for seamless integration of future data services (EV-DO and WiMAX)



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Applications

UltraWAVE CDMA can be configured to fit in a variety of applications for mobile and fixed applications.

Mobile UltraWAVE CDMA Networks

UltraWAVE CDMA can be installed as a self-contained network for mobile operators who are looking for a complete network solution. This solution fully harnesses the scalability and cost-efficiency of UltraWAVE CDMA to offer attractive voice and 153 Kbps packet data services at competitive rates.

The self-contained network serves a variety of specialty markets, such as military and government applications and disaster recovery. In some cases the self-contained network is a roaming network, e.g. cruise ship applications.

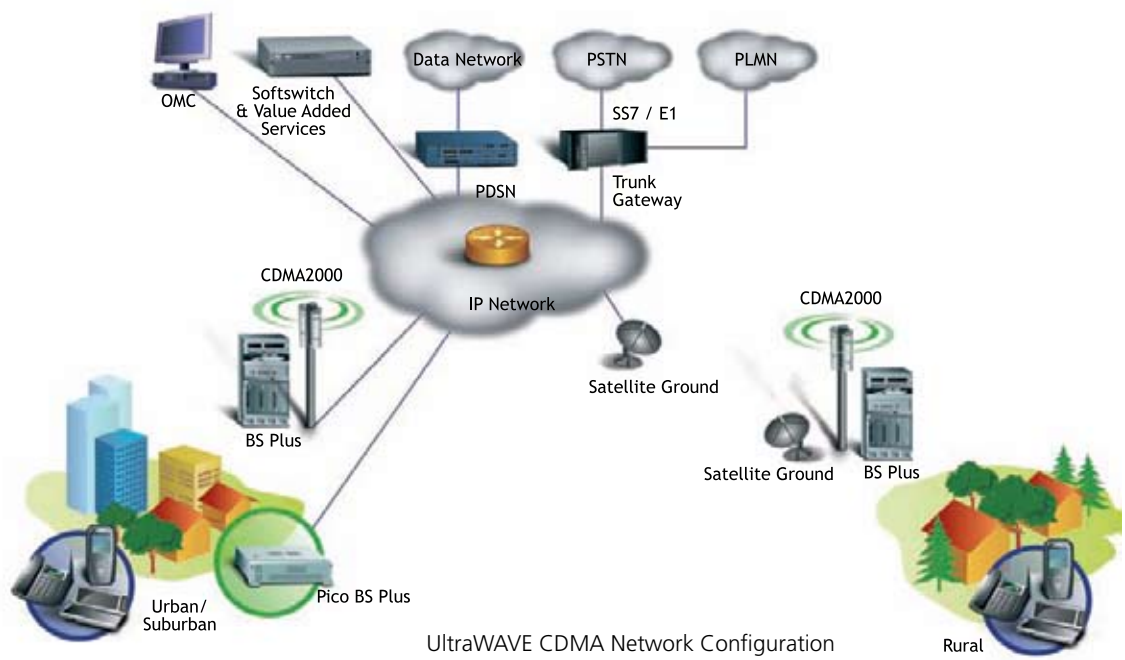
As a revenue generator, UltraWAVE CDMA offers the operator a variety of value added services; including, voicemail, prepaid and SMS. Either ADC VAS servers or the operator's third party servers may be used. Also a variety of supplementary services are available.

Reduced backhaul costs also make UltraWAVE CDMA an excellent extension to existing mobile CDMA2000 networks. Network extensions can be built around self-contained networks or by interconnecting an existing MSC with the UltraWAVE CDMA BSC. In both cases coverage can be provided in areas previously considered unreachable.

Fixed UltraWAVE CDMA Networks

For ILECs who want to extend their networks in a cost efficient manner, UltraWAVE CDMA comes as a pure access solution. Existing local exchanges (Class 5 switches) can provide existing services seamlessly over a V5.2 access interface to new remote areas. In this case, UltraWAVE CDMA acts as a cost-efficient "pipe" that can turn unreachable areas into new revenue generators. The pure access solution eliminates the need for a mobile switching center (MSC), which reduces the system complexity, time to market and total cost of ownership.

CLECs who are looking for a complete solution should consider a self-contained network featuring the UltraWAVE CDMA Softswitch and Value Added Servers. In particular, the scalability of UltraWAVE CDMA makes it a feasible choice even in very sparsely populated markets.



UltraWAVE CDMA Network Configuration

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Flexible IP Architecture for Today and Tomorrow

UltraWAVE CDMA's distributed architecture effectively integrates legacy BSC and the BTS into a single compact unit. As a result, UltraWAVE CDMA is the ideal solution for rural areas and sparsely populated towns. This architecture also minimizes carriers' initial investment for larger network roll-outs, while ensuring rapid return on investment. Taking advantage of the attractive economics of standard IP-based infrastructure technologies, UltraWAVE CDMA cuts the total cost of the network. This design approach also enhances system flexibility in addressing various network configurations, including V5.2, SS7 and PRI as well as combinations of them.

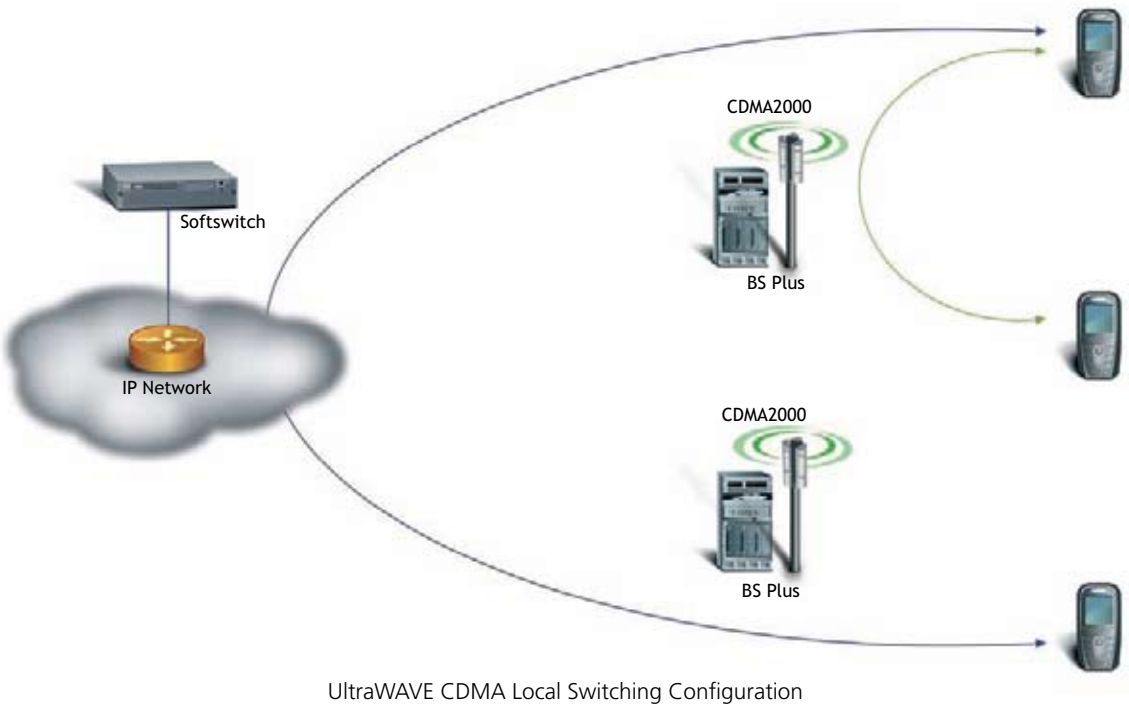
Both new and established fixed carriers and mobile operators benefit from deploying UltraWAVE CDMA. The all-IP architecture allows operators an easier migration path to MMD, IMS, and NGN. While new operators can immediately establish next generation networks (NGN), established carriers can build upon their legacy systems now with seamless migration in the future.

Furthermore, the all-IP based architecture facilitates the introduction of IP transmission between the RAN and the CN for operators who are planning ahead for IP-based multimedia services.

Local Switching

A major part of any operator's OPEX is the cost of backhauling traffic from the radio access network (RAN) to the core network (CN). Due to UltraWAVE CDMA's unique capability to offer local switching, substantial savings can be achieved. The key benefit is that calls that are terminated intra cell or inter cells can be switched locally so that the payload does not occupy any bandwidth over the backhaul system. Only the signalling is carried between the RAN and the CN. The result is significant reductions in backhaul bandwidth requirements and lower OPEX (via satellite or leased line) and CAPEX (via procured terrestrial backhaul).

In addition to cost savings on the backhaul, the introduction of local switching means less consumption of switching resources. This translates into less investment in trunk capacity.



UltraWAVE CDMA Local Switching Configuration

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System Elements

Enabling operators to build networks with a minimal initial investment and expand in relation to demand, UltraWAVE CDMA is comprised of the following system elements:

Micro BS Plus - a compact and modular rack mounted, small footprint base station. The BS Plus integrates the BSC and BTS functions into a single unit and supports local switching of intra-cell calls. Seamlessly scaleable in both frequency carriers and sectors per cell, it offers maximum coverage and optimal capacity. Eliminating the need for a central BSC results in outstanding cost effectiveness for deployments of small to medium networks. Micro BS Plus is available in all standard CDMA2000 frequency bands: 450, 850, 1900, and 2100 MHz.

Pico BS Plus - a flexible indoor platform: Ideal for in-building environments or to fill-in shadowed areas. The pico BS Plus integrates the BSC and BTS functions into a single unit and supports local switching of intracell calls. Its compact form makes it suitable for pole or wall mounting. The unit supports voice and data over 1 or 2 carriers. Pico BS Plus is available in all standard CDMA2000 frequency bands: 850, 1900, and 2100 MHz.

Softswitch - an IP call server, manages the radio access network (RAN) and the trunk gateways enabling significant savings on backhaul by providing local termination of intracell phone calls. The call server is a small rack mounted unit that supports full redundancy. It is centrally located in the network regardless of the voice traffic path and economically fits networks of all sizes up to 100,000 subscribers. The call server supports interconnection for both PRI and SS7 and enables least-cost-call routing among multiple trunk gateways.

Trunk Gateway - a modular and scaleable, rack mounted signaling and media gateway that communicates with the PSTN and PLMN over SS7 or PRI links. Multiple trunk gateways that are geographically distributed can be managed by a single soft-switch, reducing the cost of interconnection to the network. Various trunk gateway sizes are available from 2 E1/T1s 1U compact unit up to 72 E1s/T1s.

Access Gateway - a modular and scaleable, rack mounted signaling and media gateway. Located at either the class 5 switch or a remote site, the access gateway connects to one or many base stations (BS Plus) over an IP network. In this way, traffic for an entire service area is efficiently aggregated from many base station sites over a backhaul link into one central V5.2 gateway. Two sizes of access gateways are available: Small, supporting 2 - 12 E1s or Large, supporting 18 - 36 E1s.

PDSN - an optional rack-mounted unit, used as a service node for packet data transmission for always on data access. Centrally located, the PSDN efficiently aggregates the data traffic from the radio network and communicates with the operator's AAA server.

OMC - an easy-to-use and comprehensive network management system. The OMC enables remote monitoring, alarm management and configuration, which translates to savings in both maintenance time and expenses.

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Specifications

TELEPHONY SERVICES	
Voice coding:	EVRC or QCELP
Extended services:	Full transparency over V5.2 for: TAX Metering (12/16KHz), Reverse Polarity, CLASS 5 supplementary services
Always-On Data Services:	153.6kbps packet Data
MICRO BS PLUS	
Frequency bands:	450, 850, 1900, 2100MHz
Air protocol:	CDMA-1X RTT 3GPP2 Release 0, IS-95
Sectors:	1 to 3
Carriers per sector:	1 carrier
Transmit power:	20 Watt at Antenna port per carrier per sector
IP network interface:	100BaseT
Environmental:	0 to +50°C, indoor
Rack Dimensions (WxHxD):	42cm x 62.5cm x 36cm
Compliance:	FCC Part 15 and 22; UL 60950
PICO BS PLUS	
Frequency bands:	850, 1900, 2100MHz
Air protocol:	CDMA-1X RTT 3GPP2 Release 0, IS-95
Sectors:	1
Carriers per sector:	1-2 carriers
Transmit power:	100mW at Antenna port per carrier per sector
IP network interface:	100BaseT
Environmental:	0 to +50°C, indoor
Rack Dimensions (WxHxD):	32cm x 30.5cm x 13cm
Compliance:	FCC Part 15 and 22; UL 60950
SOFTSWITCH	
Management Interface:	SNMP MIBs Web browser
IP network interface:	100BaseT
Capacity:	Call Processing 150,000 BHCA
Capacity:	Traffic 2,500 Erlangs
Capacity:	VLR 100,000 subscribers
Capacity:	HLR 100,000 subscribers
ACCESS GATEWAY	
PSTN:	Interface V5.2
Capacity:	2 to 36 E1
IP network interface:	100BaseT
TRUNK GATEWAY	
PSTN interface:	ISUP SS7 / ISDN PRI
Capacity:	2 to 72 E1/T1
IP network interface:	100BaseT
Value Added Service:	VMS, SMS, PPS, AC
OPERATION, MAINTENANCE & CONTROL (OMC)	
Platform:	Linux/SUN based (Window PC optional)
Protocols:	SNMP, Web based

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