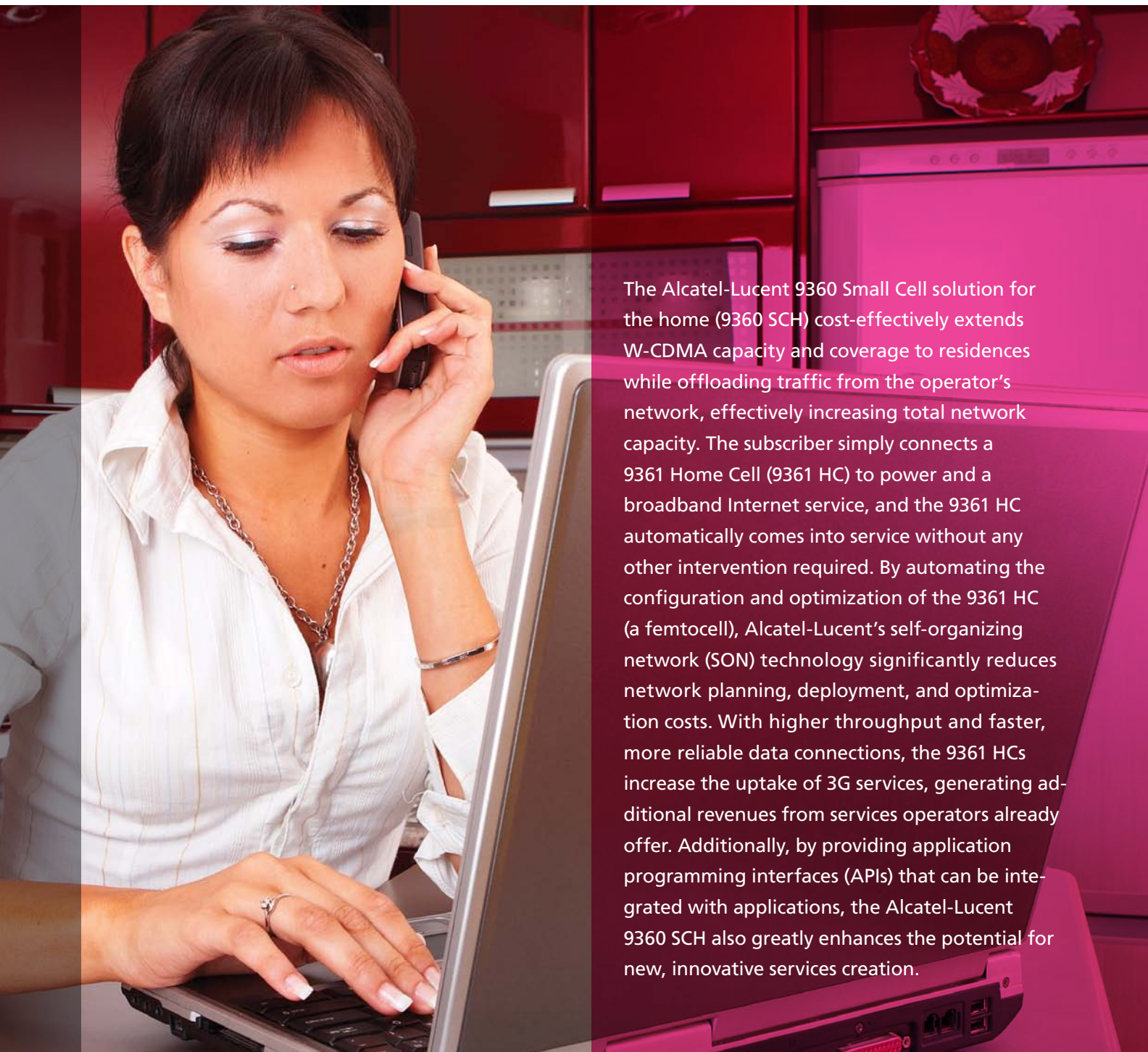


Alcatel-Lucent 9360 Small Cell Solution for the Home



Delivering big gains all around



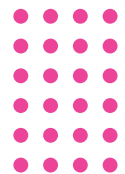


The Alcatel-Lucent 9360 Small Cell solution for the home (9360 SCH) cost-effectively extends W-CDMA capacity and coverage to residences while offloading traffic from the operator's network, effectively increasing total network capacity. The subscriber simply connects a 9361 Home Cell (9361 HC) to power and a broadband Internet service, and the 9361 HC automatically comes into service without any other intervention required. By automating the configuration and optimization of the 9361 HC (a femtocell), Alcatel-Lucent's self-organizing network (SON) technology significantly reduces network planning, deployment, and optimization costs. With higher throughput and faster, more reliable data connections, the 9361 HCs increase the uptake of 3G services, generating additional revenues from services operators already offer. Additionally, by providing application programming interfaces (APIs) that can be integrated with applications, the Alcatel-Lucent 9360 SCH also greatly enhances the potential for new, innovative services creation.





Small Cells for Big Capacity, Coverage, Quality of Experience (QoE) and Revenue



The Internet has revolutionized the way we communicate. We download music and videos, play games, and use social networking sites such as Facebook and MySpace to stay socially connected. Moreover, we are increasingly choosing to access the Internet using broadband wireless devices, such as smartphones, because the convenience afforded by these devices is fast making anytime, anywhere, multi-media communications an integral part of our everyday life. Changing mobile communication patterns coupled with the rapid proliferation of wireless devices is, however, pushing mobile networks to their capacity limits and is predicted to get only worse. According to ABI Research, by 2014 mobile broadband traffic will grow to 130 times over today's levels. Likewise, Ovum is forecasting that the number of mobile broadband users will increase 1024% between 2008 and 2014.

Although operators are planning to significantly boost the capacity of their networks to accommodate this surge in broadband traffic, the reality is that the traditional network architecture will still be unable to handle the extra traffic efficiently or economically. Gains in network capacity are usually achieved by adding new cell sites and backhaul facilities. But this requires a sizable upfront investment as well as additional ongoing operational expenses. Also, in many urban and suburban areas, locating suitable sites is becoming a challenge in itself either due to scarcity of available sites or community pressure to keep unsightly radio towers out. However, even with additional cell sites, low data throughput will still be an issue as more and more data users compete for the same spectrum. Additionally, weak signal strength at the periphery of the cell's coverage area will continue to limit the quality of the data service in those

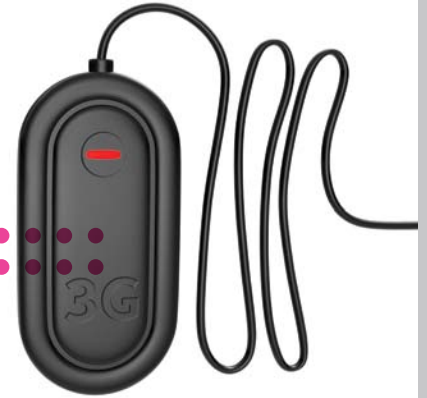




locations. Further magnifying the problem is the higher frequencies that are deployed in many 3G networks. These do not penetrate buildings well, making high data throughput difficult to achieve indoors where 40% to 60% of all mobile communications occurs.

By extending the reach of mobile networks, small cells provide a more efficient, cost-effective option for growth. Not only do small cells greatly increase network capacity, but more importantly, they provide dedicated capacity to residents, enterprises, and metro hotspots where most data usage occurs. Because small cells bring the base station closer to the end-user device, improving the signal to noise ratio (SINR), they provide faster, more reliable data connections, making them a vital component of any mobile broadband network. Small cells also free up capacity on the macro network for subscribers on the go.

The Alcatel-Lucent 9360 Small Cell solution for the home (9360 SCH) cost-effectively extends network capacity and coverage to residences. As a fully integrated carrier grade end-to-end solution, consisting of the 9361 Home Cell (9361 HC), the small cell gateway, and the small cell management and customer care system, it easily integrates into an operator's existing 3G network. The 9361 HC access point, about the size of a paperback book, is placed inside the home and uses the subscriber's existing broadband connection to backhaul voice and IP traffic to the mobile service provider's core network. Because it is part of the wireless network infrastructure, transmission is secure and handovers are seamless between the 9361 HC and the macro network.



Cost-effectively increasing network capacity

Capacity gains from small cells come from increased relative signal strength resulting in improved SINR. Since the 9361 Home Cell is placed inside the home, it is closer to the user equipment. This enables both the base station and user equipment to maintain high SINR while using low power to transmit. Interference from macro cells and other small cells in the neighborhood is further mitigated using Alcatel-Lucent Self-Organizing Network (SON) technology, resulting in improved spectral efficiency and higher capacity for all.

The Alcatel-Lucent 9360 SCH not only increases capacity for individual users, but more importantly for the network as a whole. By providing dedicated in-home coverage and using the subscriber's existing broadband Internet connection, the 9360 SCH offloads traffic from the operator's network, resulting in an overall increase in macro network capacity as 9361 HC access points are added to the network. Small cells lessen the need to deploy new cell sites and Radio Network Controllers (RNCs) to accommodate growing capacity demands, reducing capital expenses. With the deployment of fewer cell sites, savings are also realized from reduced backhaul costs, lower cell site real estate rental fees and smaller power bills. According to a recent Bell Labs study, incorporating small cells into the network can save operators 12% to 53% in CAPEX and 5% to 10% in OPEX, depending on traffic loading and projections.

Extending network coverage

Many subscribers cannot use mobile broadband, or for that matter, make a simple voice call while at home, leading up to 50 percent of mobile subscribers to complain about poor indoor service. With the Alcatel-Lucent 9360 SCH, operators can cost-effectively target W-CDMA, HSDPA, and HSUPA coverage where subscribers use it the most – in the home. Users not only benefit from extended network coverage, but from individual, dedicated capacity. Additionally, with Alcatel-Lucent SON technology, the 9360 SCH is constantly learning about the household and its members' calling patterns, continuously self-adjusting to deliver the best indoor coverage possible.



Improving quality of experience

The Alcatel-Lucent 9360 SCH dramatically improves the end user's QoE. A higher quality air interface is delivered by moving the base station closer to the user equipment, providing faster, more reliable data connections and higher data throughput. Moreover, the 9361 Home Cell's flat IP architecture ensures a low latency, full HSDPA speed experience so that high bandwidth services, such as mobile TV and streaming videos can be comfortably enjoyed at home with no quality degradation. Excellent indoor coverage means mobile subscribers experience better voice quality with no dropped calls due to dead zones. The battery life of mobile devices is also extended since they now only need to transmit at a very low power.

The 9360 SCH also improves QoE for users of the macro network. By offloading the in-home heavy data users from the macro network, small cells free up limited resources for subscribers on the move. With fewer users per cell there is more bandwidth available for all.

Increasing revenue

With higher throughput and faster, more reliable data connections provided by the Alcatel-Lucent 9360 SCH, usage greatly increases for such services as mobile TV, customer-specific TV clips such as football or soap operas, child monitoring, user-generated content, downloads and gaming, while driving up the uptake of value-added 3G multimedia services both in and out of the house. Excellent in-home coverage also results in more mobile calls being originated and answered by subscribers while at home. With better voice quality, the conversations are also likely to last longer. The bottom line is that 9360 SCH increases revenue from services that mobile service providers are already offering on their network.

Fixed mobile convergence (FMC) services, which allow operators to capture fixed line revenue, are also enabled by the Alcatel-Lucent 9360 SCH. Subscribers gain lifestyle simplification and convenience from one handset, phone book, and voice mail to manage and pay only one bill. FMC plans may also include a reduced in-home tariff as well as plans that support multiple in-home lines. Additionally, with small cells-enabled FMC, service continuity is a reality as calls and sessions originated at home continue as the subscriber travels outside the house.

→ Key Features

Applications enablement

The Alcatel-Lucent 9360 SCH enables mobile service providers to leverage the solution's unique network capabilities, such as location, presence, quality of service (QoS) and trusted security for applications development, either by the operator or third parties. By providing application programming interfaces (APIs) that can be integrated with applications, Alcatel-Lucent's 9360 SCH greatly enhances the potential for innovative services creation.

A 9360 SCH Small Cell Inform API enables applications to get presence information from the Alcatel-Lucent 9361 HC, making services like One Family Number, Home Notes and Child Tracking possible. A Small Cell Local Connect feature allows users to redirect data sessions from the core network to their local home network, providing higher throughput for media sharing applications and gaming. The Alcatel-Lucent 9360 SCH also enables secure payment transactions by using secure access over a licensed spectrum.

Plug and play

With the Alcatel-Lucent 9360 SCH, expensive site visits are avoided. The subscriber simply plugs the 9361 HC into an electrical outlet and connects it to an existing broadband Internet service. After installation, the 9361 HC automatically comes into service without any further intervention required by the subscriber. At registration, the 9361 HC also determines its location and then constantly monitors its environment for any changes, allowing the mobile service provider to control its location, which is critical for emergency calling and other location-associated services.

Auto-configuration reduces the cost of small cell deployment and decreases the need for large customer support teams. It also lessens the need for massive reprovisioning following macro network replanning.





SON innovation

Alcatel-Lucent SON technology, powered by our W-CDMA experience and Alcatel-Lucent Bell Labs research and development, not only significantly reduces the network planning and deployment costs of Alcatel-Lucent small cells, but also improves network performance and operational efficiency by automating the configuration and optimization of 9361 HC access points. Not only does SON empower the 9360 HC to automatically configure itself at power up, it also enables it to periodically monitor, update, and optimize its neighbor relation lists and handover parameters to eliminate unwanted handovers at the edge of the macro network, reducing handover failures by up to 80%. Using SON technology, the 9361 HC also has the capability to intermittently adjust its transmit power and the scheduling of resource settings to avoid intercell interference.

Best-in-class network management solution

By combining the strengths of Alcatel-Lucent's Wireless Management System (WMS), Wireless Provisioning System (WPS), and the Home Device Manager (HDM) from Motive, the small cells management and customer care ecosystem provides a single, fully integrated system for managing the 9360 SCH. A dedicated version of the widely deployed

WMS for W-CDMA networks, the WMS for small cells performs 9361 HC auto-configuration and macro network synchronization while the WPS ensures configuration data consistency across the solution elements. Alcatel-Lucent's HDM, an industry-leading management solution for TR-069 devices manages over 70% of all deployed CPE devices worldwide and not only provides "zero touch" automated service provisioning, but also real-time troubleshooting capabilities by providing a diagnostic view of the 9361 HC inside the home. The small cells management system reduces small cell deployment, maintenance, and support costs, and increases revenue by accelerating time-to-market for new services.

With the Alcatel-Lucent 9360 SCH, the mobile service provider is well positioned for the mobile broadband Internet revolution. Not only does it provides immediate capacity relief by cost-effectively targeting coverage expansion where subscribers use it the most — in the home — but it also delivers a better multimedia experience to drive the uptake of revenue-generating 3G services. And leveraging Alcatel-Lucent's application enablement APIs, the mobile service provider also has the flexibility to create new, innovative services.

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