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Informa Telecoms & Media analysts regularly attend industry conferences, either to deliver presentations, chair a session or simply to research a specific topic. Below we list those events that our analysts are due to attend over the coming months.

Please e-mail the relevant analyst directly if you would like to set up a meeting at or around one of the conferences.

| Event | City, Country | Date | Website | Analyst |
|------------------------|------------------------|-------------|--|--|
| Mobile World Congress | Barcelona, Spain | 14-17 Feb | www.mobileworldcongress.com | julian.bright@informa.com kris.szaniawski@informa.com dimitris.mavrakis@informa.com |
| LTE Latin America 2011 | Rio de Janeiro, Brasil | 12-13 April | www.lteconference.com/latam | mike.roberts@informa.com |
| LTE Mena 2011 | Dubai, UAE | 17-19 Apr | www.lteconference.com/mena | dimitris.mavrakis@informa.com |
| LTE World Summit 2011 | Amsterdam, Netherlands | 17-19 May | www.lteconference.com/world | julian.bright@informa.com dimitris.mavrakis@informa.com |
| LTE Asia 2011 | Singapore | 6-7 Sep | www.asia.lteconference.com | |
| LTE North America 2011 | Dallas, Texas, USA | 8-9 Nov | www.lteconference.com | |

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Vendors build a case for small-cell architectures

Julian Bright

- Major vendors, including Alcatel-Lucent, Ericsson, NEC and Huawei, are building a strong case for small cell architectures to be deployed for both 3G and LTE, saying they offer significant commercial and performance benefits.
- A number of operators are said to be on the verge of significant deployments of small cells, though there are potential problems with integrating them into the macro-cell environment.
- Self-organizing networks are expected to play a key supporting role in areas such as interference management, network integration and operations and maintenance.

The case for deploying smaller cell configurations – such as picocells, microcells and femtocells – to supplement traditional macro-cell-network architectures, both for LTE and existing 3G networks, is becoming more compelling, according to some leading network-equipment vendors. The vendors say small cell architectures can improve capacity and performance while circumventing the need to deploy cumbersome and expensive new base stations and can give operators commercial advantages, such as a boost in market share.

Alcatel-Lucent has been the most vocal major vendor on this topic, saying that small cells are a significant, disruptive trend in networks and that it already has 14 commercial contracts and 20 trials in place for small cell deployments. The company says that in the coming months, the ways in which small cells can improve network performance will become apparent, and more access points will appear in streets and public access areas such as shopping malls.

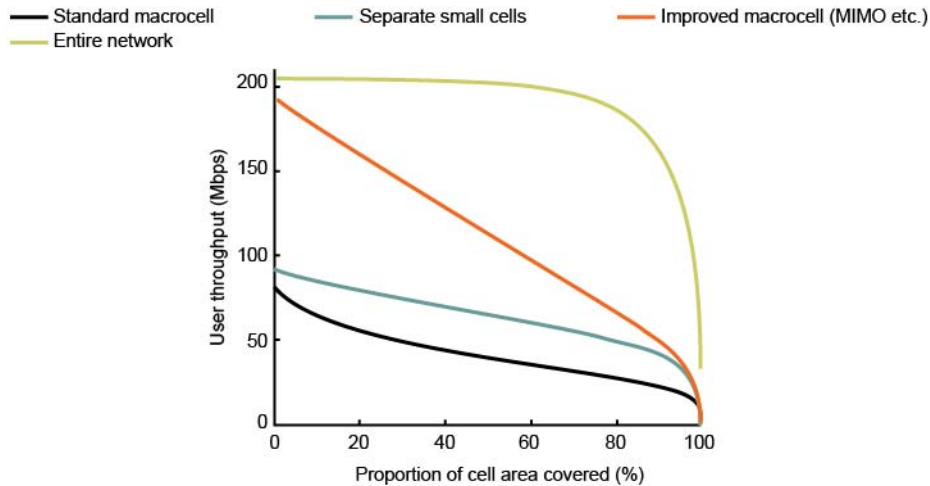
The vendor says small-radius cells can be used to provide a second layer of coverage in WCDMA and LTE networks, resulting in higher throughput and data rates for the end-user and improved performance at the cell edge. They also use less energy than macrocells and have a far smaller physical footprint. A 70kg base station using 5kW of power can be replaced by a cell a few inches square, which can be hidden from view.

Compared with alternative approaches such as MIMO, making cells smaller is the fastest and most effective way of increasing an operator's capacity, Alcatel-Lucent says. The company has estimated that using a small-cell approach could save it 12-50% on capex and 5-10% on opex, based on the total cost of rolling out new RNCs and new cell sites.

Ericsson has recently outlined a small-cell strategy as part of its heterogeneous-network concept, which incorporates microcell and picocell technologies alongside less-complex relay base stations that pass information back to the macro base station. The technology offers might higher levels of throughput to the cell edge, unlike a standard macrocell environment.

The addition of separate small cells can boost performance relative to a standard macronetwork, the vendor says. When combined with a heterogeneous network with additional carriers and features such as MIMO, which are already being used to create an "improved macro" level of performance, small cells can drastically reduce the deterioration in performance experienced as the distance from the base station increases, Ericsson says (see fig. 1).

Fig. 1: Coverage of heterogeneous-network components, by cell type



Source: Ericsson

An important element of Ericsson’s approach is that it avoids allocating specific frequency bands to small cells that are introduced into the network, thus making better use of the available spectrum and removing the risk that overall network performance will deteriorate. Ensuring co-ordination of small cells with the macro layer also allows all cells to make full use of the available spectrum resources, says the vendor.

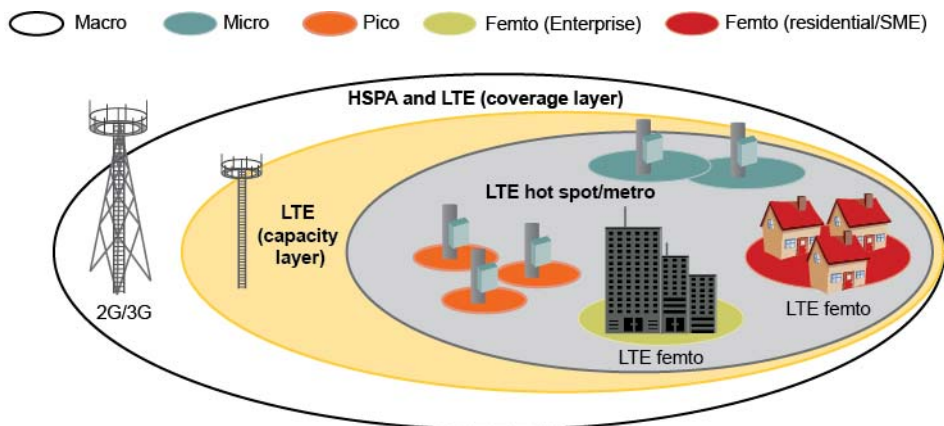
Ericsson expects to see small-cell 3GPP systems deployed in parallel with public Wi-Fi hot spots, which it acknowledges can provide superior coverage in some in-building environments, such as shopping malls, where spectrum usage is more controlled. Coordinated radio systems of the kind proposed in its heterogeneous network model are better suited to an uncontrolled environment where spectrum use needs to be synchronized, however.

Small cells and LTE

Also backing the small-cell trend is NEC. The company says that for LTE, macrocell deployment is not an option, since it costs too much and will not offer the necessary capacity and performance, particularly since data-traffic revenues are generated mostly through hot spots and in-building use.

NEC envisages a small-cell overlay network for LTE providing a capacity and performance layer, with microcell and picocell coverage for metro hot spots complemented by femtocells in residences and small and medium-sized enterprises. Macronetwork coverage is already provided by 2G and 3G networks, the vendor says (see fig. 2). It describes small cells as sustainable, fast to deploy, cheap and easy to install and operate. It is also possible for operators to start small and build up the network as the number of users and/or traffic increases.

Fig. 2: Small-cell architecture for LTE



Source: NEC

Although factors such as coding and modulation techniques and MIMO can boost capacity, limited spectrum availability means that frequency reuse is the key to keeping up with an increase in traffic, NEC says. Small cells can reuse frequencies, providing higher average and peak cell-edge throughput, improving the network's quality of service and giving a better user experience.

The vendor says that for the same density of traffic, its small-cell base station offers an average of 2.5 times the user-downlink data rate of a medium-sized macrocell and up to three times the downlink data rate at the cell edge. For a mean data rate of 10Mbps, throughput is about four times that of a macrocell. Improvements in uplink performance are even greater, the company says, and the benefits of small cells rise with the size of the macrocells being compared.

A mixed macro/small-cell architecture offers about 2.5 times the user data rate of a pure macrocell environment, providing 1.8 times the capacity for a mean data rate of 10Mbps per user. An operator deploying small cells will see a significant improvement in terms of cost-per-bit-per-square-km, NEC says.

Huawei has produced similar calculations. Using simulations, the vendor found that a network consisting of seven macrocells and 23 microcells offered an average of 50% more throughput at the cell edge than a macro-only model, and total throughput was two-and-a-quarter times higher.

Smart antenna systems

Ericsson says macronetwork base stations will continue to be a volume product for the company, but as the radio platform evolves toward a multistandard environment combining 2G, 3G and 4G, parallel developments in integrated antenna systems are also favoring the move towards small cell architectures.

The evolution toward a multistandard radio platform is bringing about a move away from passive antenna systems to the use of active antennas that are more closely integrated with the radio platform, an approach that improves performance, decreases power consumption and enables the integration of an active, multistandard integrated antenna on top of the existing 2G/3G infrastructure, with embedded 4G capability.

This approach in turn opens up the possibility of developing a more distributed pattern of antenna deployments, since the antennas are embedded with the radio. It is thus possible to develop a number of different small-cell form factors.

Deployment challenges and SONs

Mobile operators, such as Canada's Telus, acknowledge that there is a need for smaller cells for both indoor and outdoor coverage as part of a 4G rollout. Despite their benefits, however, small cells pose a number of challenges for operators.

In a presentation at Informa's LTE Americas conference in Dallas in November, Telus said that key areas to be addressed include interference management in a macrocell environment; the integration, operation and management of small cells in an existing network; and handover and load-balancing performance and optimization (see fig. 3). It also cited as a concern hardware cost and dimensions – in cases where equipment is sited on street furniture such as lampposts, for example – along with the difficulty of determining appropriate investment in an environment of uncertain local demand.

Fig. 3: Challenges in deploying small-cell networks

| |
|--|
| Interference management <ul style="list-style-type: none"> • Outdoor: picocell/microcell and macrocell interference • Indoor: femtocell/picocell interference in dense deployments |
| Handover and load-balancing performance and optimization |
| Integration, operation and management of small cells within existing network |
| Hardware <ul style="list-style-type: none"> • Antenna size (eg. when sited on lampposts) • Equipment dimensions, mounting options, power supply • Upgradeability and future-proofing |
| Cost <ul style="list-style-type: none"> • Equipment • Backhaul • Installation, maintenance and upgrades |
| Difficulty of aligning investment with uncertain local demand |
| Aligning small-cell strategy with heterogeneous networks <ul style="list-style-type: none"> • Offload to 3GPP and to non-3GPP technologies, such as Wi-Fi • Traffic management and seamless user experience |
| <i>Source: Telus</i> |

Vendors say self-organizing-network (SON) capabilities, such as automatic configuration of the cell at power-up, are key requirements in creating and managing small-cell networks. Alcatel-Lucent says its technology incorporates a number of SON features developed by Bell Labs, including the capability to periodically monitor, update and optimize the cell's neighbor-relation lists and handover parameters, and continuous adjustment of the cell's transmission power to the surrounding environment to optimize coverage.

Smaller cells also offer the possibility of "sculpting" the radio pattern so that it is tailored to a small area, such as a single building, Alcatel-Lucent says.

Commercial opportunity

The commercial opportunities arise where aspects such as location come into play, Alcatel-Lucent says. Since far fewer users are likely to be connected to a small cell than a larger one, making cells smaller "personalizes" the bandwidth, making it easier to pinpoint the subscriber's location and offer relevant support services, such as mobile advertising. Classical macronetwork base stations don't offer the same opportunities to profit from such services, the vendor says.

Alcatel-Lucent also says that a number of its customers are looking for a smarter way to handle offload than deploying Wi-Fi, which it says picks up a high proportion of traffic only because of the shortcomings of cellular networks. Not only can Wi-Fi be an expensive option for providing access in the street, given the complex software required in access points, but any benefit from the higher data rates offered by Wi-Fi will be largely undone by constraints in the backhaul.

The company says a number of cable operators that are considering entering the market are looking at wholly femtocell-based LTE rollouts, raising the possibility that fixed-line operators could act as wholesale providers of femto-based offload and backhaul for cellular operators.

Informa viewpoint

The growing consensus among the major vendors on the subject of small-cell architectures reflects a growing conviction that this will be the next significant trend in the network-infrastructure supply market.

The traditional market for large-scale, macronetwork base stations will continue to dominate, with developments such as multiradio platforms and software-defined radio continuing to have a considerable impact. The trends toward low-power, compact base-station form factors and integrated active antenna technology suggest that small-cell deployments will become more important in terms of product development.

Ericsson's backing for this approach is significant, since the vendor is one of the leading players in the market for large-scale macrocell products, and the move is a significant new direction

for the company. Other vendors, such as NEC and Alcatel-Lucent, have already begun to establish a presence in the femtocell market and are looking to evolve the technology beyond its current consumer and enterprise focus. Alcatel-Lucent can also be expected to emphasize its strength in SONs via its Bell Labs facility.

The trend toward small cells also signals a switch in emphasis from coverage to end-user performance, and the message from vendors will reflect the belief that these new network architectures can not only improve network performance but also bring significant commercial benefits in terms of customer retention and targeted services.

Ericsson, world's largest 'mobile network operator,' shows strong managed-services growth

Kris Szaniawski

- Ericsson continues to see strong growth in managed services, with 2010 sales up 21%.
- Services sales as a whole continue to make up an increasing proportion of Ericsson's total business, and by end-2010 Ericsson's 45,000 service professionals accounted for half of the vendor's work force.
- The recent LTE-managed-services deal with Danish operator TDC paves the way for more 4G/LTE outsourcing deals.
- The influx of OSS/BSS expertise also provides an opportunity for the vendor to target this sector.

Ericsson's managed-services growth is continuing at a strong pace, with no sign that it might be slackening. Scale and experience clearly still count in this game, especially if you continue to win 29-country extension contracts with the likes of TeliaSonera and win business in fast-growing markets, such as China and Indonesia.

Last week's 4Q10 results show that, year-on-year, Ericsson's managed-services sales grew 5% in the fourth quarter and 21% in the full year (see fig.). By comparison, overall group sales in 2010 were down 2%. It's worth keeping in mind that the 4Q10 growth is so much lower than the full-year growth partly because of the massive Sprint contract that was added in 4Q09.

Ericsson global services sales, 2009 and 2010

| | 4Q09 | 4Q10 | Change (%) | 2009 | 2010 | Change (%) |
|-----------------------|------|------|------------|------|------|------------|
| Global services sales | 23.1 | 22.9 | -1 | 79.2 | 80.1 | 1 |
| Professional services | 16.5 | 16.7 | 1 | 56.1 | 58.5 | 4 |
| Managed services | 5.1 | 5.4 | 5 | 17.4 | 21.1 | 21 |
| Network rollout | 6.7 | 6.2 | -8 | 23.1 | 21.6 | -7 |

Source: Ericsson

Whichever way you look at it, the services business is becoming more important to Ericsson, and it was important enough as it was. Services sales as a whole continue to make up an increasing proportion of the Ericsson's total business. In 2010, services sales accounted for 39% of total business, compared with 37% for hardware sales and 24% for software sales.

These figures are not surprising, given that Ericsson claims to now manage networks with more than 750 million subscriptions. That is more subscriptions than all of Western Europe and more or less the same number controlled by the two largest global operators combined: China Mobile and Vodafone.

By year-end, services was also accounting for half of Ericsson's employees, with 45,000 services professionals out of a work force of 90,261. Layoffs have obviously had some impact on the way this balance has shifted, but there has also been plenty of recruitment, and that has tended to focus on R&D and service delivery. Furthermore, managed-services contracts by their very nature bring in fresh blood – more than 20,000 services employees have come from operators, with 6,000 alone off the back of the major Sprint deal.

The transfer of employees with new skill sets also helps build up new areas of expertise. A significant proportion of the 20,000 employees transferred to Ericsson are involved in OSS/BSS, and this is helping Ericsson build up competence in this area. OSS/BSS is one of the areas Ericsson is planning to play a bigger role in, along with network sharing.

Major contracts, including LTE deal

Ericsson signed 54 new managed-services contracts in 2010, of which 26 were extensions or expansions of agreements.

Significant deals included the TeliaSonera managed-services contract mentioned earlier. Awarded in November, this three-year extension covers 29 countries and adds a field-maintenance element in Russia that was not there before.

Another important managed-services deal Ericsson signed in 4Q10 was with Danish operator TDC. The deal is significant for Ericsson because it is its first full-scope managed-services contract for an LTE/Evolved Packet Core network. There is a lot of potential for managed-services business off the back of LTE, so early deals like this one will be watched closely. TDC and Ericsson first signed an outsourcing deal in 2008, suggesting that operators might find it easiest to stick with their existing managed-services providers as they migrate to LTE.

Other 4Q10 managed-services deals for Ericsson included one with China Unicom and another with Axis in Indonesia. The Unicom deal is a three-year integrated field-maintenance contract, with Ericsson taking responsibility for base-station sites and fixed and transmission networks serving five major cities in China's Anhui province. The Axis deal involves taking full responsibility for operations and field maintenance of Axis' network in Greater Jakarta and Northern Sumatra in Indonesia and is not a small deal, as it requires Ericsson to support more than 3,000 base stations and about 8 million subscriptions.

Informa viewpoint

There is no sign of a slowdown in Ericsson's solid growth in managed-services sales. Ericsson has been winning healthy numbers of new and expansion contracts, but the recent LTE managed-services contract win with TDC is especially significant. If other established Ericsson managed-services customers follow TDC's lead, the vendor stands to do well not just from supplying LTE networks but also managing them.

But LTE is not the only managed-services opportunity Ericsson is pursuing. It is also planning to use increased OSS/BSS staff numbers to help it play a stronger role in the OSS/BSS sector and sees an opportunity for expanding its role in network-sharing deals. There is nothing to stop some of these opportunities from being combined: LTE could well turn into a driver for a model that combines network sharing and managed services.

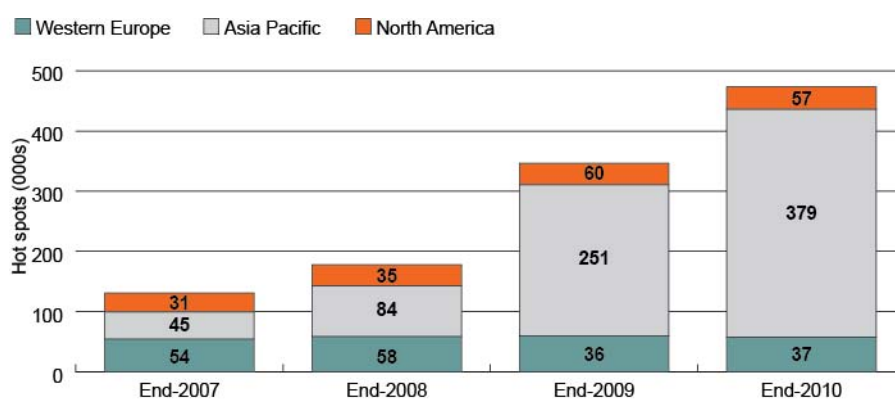
Finally, although services sales as a whole are making up a greater proportion of Ericsson's total business, it is worth pointing out that in 2010 the picture was not as rosy for Ericsson's global services business as a whole as for managed services. Ericsson's global services business is made up of three business areas: managed services, professional services and network rollout. And neither of the other two performed as well as managed services. Network rollout in particular has helped depress figures, with both annual and fourth-quarter sales down year-on-year. The drop was partly due to currency-exchange-rate effects, but sales were also affected by lower network-rollout volumes.

Asia still fuelling public WLAN hotspot growth

Informa Telecoms & Media

The number of public wireless LAN hot spots from major operators in Asia, Western Europe and North America was up 8% quarter-on-quarter at end-4Q10, having risen 35,284 to end the year at more than 473,000. More than 127,000 hot spots were added throughout 2010, equating to an annual growth rate of 36.7%. There were just 130,000 hot spots at end-2007 (see fig. 1).

Fig. 1: Global, number of PWLAN hot spots, end-2007 to end-2010



Source: Informa Telecoms & Media

Asia Pacific accounted for much of the growth, with the other two regions relatively stable. According to Informa Telecoms & Media data, Asia Pacific accounted for 80% of the total at end-2010, Western Europe accounted for 12.1% and North America 7.9%.

The growth trend looks set to continue, given the popularity of Wi-Fi-enabled handsets and moves by carriers to increase their reliance on WLAN hot spots to cope with the massive demand for mobile data services in urban areas. Major cellular operators such as AT&T, NTT and T-Mobile all have extensive networks of PWLAN locations, and there are signs that operators will be looking to hand off some of their wireless data traffic to the Wi-Fi hot spots and hot zones.

By far the country with the most hot spots is China, with an estimated 290,000 in service among the three main service providers: China Telecom, China Mobile and China Unicom. Unicom added 20,000 net locations in 4Q10 alone, though its hot-spot network – with about 90,000 locations – is reportedly largely complete (see fig. 2).

Fig. 2: Global, public Wi-Fi market highlights, end-2010

| Highlight | Network/country | Hot spots, end-3Q10 | Hotspots, end-4Q10 | Change | Change (%) |
|-----------------------|----------------------------|---------------------|--------------------|---------------|-------------|
| Most hot spots opened | China Unicom | 70,000* | 90,000* | 20,000 | 28.60 |
| Most hot spots closed | Orange France | 12,500 | 11,172 | -1,328 | -10.60 |
| Largest operator(s) | China Telecom/China Mobile | 100,000 | 100,000 | - | - |
| Largest market | China | 270,000 | 290,000 | 20,000 | 7.40 |
| Global total | | 438,383 | 473,667 | 35,284 | 8.00 |
| *Estimate | | | | | |

Source: Informa Telecoms & Media

China Mobile is one of about 30 telecoms operators to be part of the Wireless Broadband Alliance (WBA), an industry group established in 2003 to promote the development of the hot-spot sector. The alliance has grown to include equipment manufacturers, software developers and international roaming aggregators, as well as companies with a broader interest in the

Wi-Fi sector, such as Google, Skype and Intel. The WBA has a global footprint encompassing 220,000 hot spots, and its member companies serve about 350 million subscribers among them. Members include AT&T, Verizon Wireless, NTT, T-Mobile Group, Telefonica, BT and Swisscom.

“We are living in a world where there is explosive growth of mobile data, driven by new handheld devices, rich content and easy-to-use applications,” WBA Chairman Chris Bruce said when the organization announced a raft of new partners in November. “Meanwhile, the desire to use social networks and be available is always growing.”

Global Public WLAN coverage by operator and country, 4Q10

| Operator | Type | Commercial PWLAN launch | End-4Q09 | End-1Q10 | End-2Q10 | End-3Q10 | End-4Q10 | End-4Q11e | Selected roaming agreements |
|-----------------------|------------------|-------------------------|----------|----------|----------|----------|----------|-----------|--|
| Asia-Pacific | | | | | | | | | |
| Australia | | | | | | | | | |
| Internode | Startup | 2004 | 164 | 170 | 196 | 215 | 256 | 300 | None |
| DoCoMo interTouch | Startup | Apr-03 | 250 | 250 | 250 | 250 | 250 | 250 | iPass, Boingo |
| Telstra | Fixed and mobile | Jul-03 | 334 | 334 | 334 | 334 | 183 | 100 | WBA*, iPass |
| Azure Wireless | Startup | Oct-02 | 0 | 0 | 0 | 0 | 0 | 0 | Acquired by DoCoMo InterTouch |
| China | | | | | | | | | |
| China Telecom | Fixed | 2002 | 95,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | Boingo |
| China Mobile | Mobile | Mar-03 | 90,000 | 95,000 | 100,000 | 100,000 | 100,000 | 100,000 | Swisscom, NTT Communications, Boingo |
| China Unicom (Netcom) | Fixed | Nov-01 | 25,000 | 35,000 | 50,000 | 70,000 | 90,000 | 90,000 | WBA*, Swisscom, Boingo |
| Hong Kong | | | | | | | | | |
| PCCW | Fixed | Apr-02 | 2,770 | 2,608 | 2,640 | 2,669 | 2,807 | 2,900 | iPass |
| YSZone | Startup | 2003 | 623 | 640 | 660 | 699 | 742 | 800 | iPass, Boingo, Airpath |
| India | | | | | | | | | |
| Tata/VSNL | Fixed | Nov-03 | 476 | 476 | 524 | 524 | 491 | 500 | WBA* |
| BSNL | Fixed and mobile | Aug-05 | 350 | 350 | 350 | 350 | 350 | 350 | Dishnet |
| Airtel | Mobile | Oct-04 | 60 | 73 | 85 | 98 | 151 | 200 | None |
| Sify | ISP | Oct-03 | 107 | 107 | 107 | 107 | 107 | 107 | Pronto Networks |
| Microsense | Startup | Mid-04 | 23 | 23 | 23 | 23 | 23 | 23 | None |
| Indonesia | | | | | | | | | |
| Indosat M2 | ISP | Aug-04 | 147 | 146 | 146 | 146 | 146 | 146 | WBA* |
| Japan | | | | | | | | | |
| NTT West | Fixed | Jun-02 | 4,006 | 4,008 | 4,008 | 4,008 | 4,008 | 4,008 | NTT Com, NTT DoCoMo |
| Softbank Telecom | ISP | Late 2002 | 3,347 | 3,347 | 3,347 | 3,370 | 3,424 | 3,500 | T-Systems, Boingo, iPass, WeRoam |
| NTT DoCoMo | Mobile | Jul-02 | 3,015 | 2,930 | 3,090 | 3,203 | 3,236 | 3,300 | NTT West, NTT Com, TeliaSonera, iPass |
| NTT Communications | Fixed | May-02 | 1,710 | 1,655 | 1,642 | 1,632 | 1,520 | 1,400 | WBA*, NTT West, China Mobile, iPass |
| Malaysia | | | | | | | | | |
| TM Net | ISP | Nov-03 | 1,530 | 2,228 | 2,310 | 2,389 | 2,535 | 2,800 | None |
| Airzed | Startup | Aug-02 | 202 | 202 | 202 | 202 | 202 | 202 | None |
| Maxis | Fixed and mobile | Mar-03 | 111 | 111 | 111 | 111 | 111 | 111 | WBA*, Boingo |
| New Zealand | | | | | | | | | |
| Telecom New Zealand | Fixed and mobile | Jul-04 | 364 | 364 | 364 | 364 | 364 | 364 | iPass |
| CafeNET/CityLink | Startup | Oct-03e | 180 | 180 | 173 | 173 | 173 | 173 | None |
| Philippines | | | | | | | | | |
| Smart Bro (Airborne) | Startup | NA | 367 | 380 | 435 | 483 | 483 | 500 | None |
| GlobeQUEST | Startup | May-03 | 87 | 88 | 88 | 88 | 88 | 90 | None |
| Singapore | | | | | | | | | |
| SingTel | Fixed and mobile | Sep-02 | 841 | 1,117 | 1,117 | 1,117 | 1,134 | 1,200 | iCell, QMax, iPass, Airpath |
| Qmax/M1 | Startup | Jan-07 | 693 | 693 | 693 | 693 | 695 | 700 | SingTel, iCell |
| iCell/PC Connect | Startup | NA | 478 | 631 | 631 | 631 | 634 | 650 | SingTel, QMax, StarHub, Bluengine, NetRoam |
| StarHub | Fixed and mobile | Aug-02 | 60 | 60 | 60 | 60 | 60 | 60 | WBA*, Bluengine, iCell |
| South Korea | | | | | | | | | |
| KT Olleh | Fixed and mobile | Feb-02 | 10,976 | 10,649 | 21,000 | 35,582 | 42,647 | 44,000 | WBA*, NTT Communications, iPass, Boingo |
| SK Telecom | Fixed and mobile | Jun-10 | 0 | 0 | 1,100 | 7,000 | 15,000 | 50,000 | None |
| Hanaro | Fixed | Feb-02 | 184 | 184 | 184 | 184 | 184 | 184 | iPass |

| Operator | Type | Commercial PWLAN launch | End-4Q09 | End-1Q10 | End-2Q10 | End-3Q10 | End-4Q10 | End-4Q11e | Selected roaming agreements |
|-----------------------|------------------|-------------------------|----------|----------|----------|----------|----------|-----------|--|
| Taiwan | | | | | | | | | |
| Q-Ware/WiFly | Startup | Dec-05 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | Boingo |
| Chunghwa | Fixed and mobile | Jun-02 | 985 | 969 | 969 | 969 | 969 | 969 | Boingo |
| Yaw Jenq/Easy-up | ISP | Mar-03 | 557 | 557 | 546 | 546 | 546 | 546 | None |
| Mobitai/Mobee Lan | Mobile | NA | 0 | 0 | 0 | 0 | 0 | 0 | Trustive |
| Thailand | | | | | | | | | |
| TRUE Corp | Fixed and mobile | Nov-04 | 418 | 418 | 418 | 418 | 418 | 418 | WBA*, KSC |
| KSC | Startup | NA | 132 | 133 | 135 | 137 | 137 | 150 | TRUE Corp |
| MilCom/WLANNet | Startup | 2003 | 60 | 73 | 57 | 57 | 57 | 57 | Boingo |
| North America | | | | | | | | | |
| Canada | | | | | | | | | |
| Bell Mobility | Fixed/mobile | 2004 | 824 | 824 | 824 | 824 | 824 | 824 | Telus, Rogers Wireless, Microcell |
| Rogers Wireless | Mobile | Oct-04 | 373 | 373 | 373 | 373 | 373 | 373 | Telus, Bell Canada, Microcell |
| FatPort | Startup | Mar-02 | 112 | 112 | 107 | 101 | 101 | 100 | Airpath, Surf and Sip, BBX, Boingo, iPass, WeRoam |
| Telus | Fixed/mobile | Oct-03 | 0 | 0 | 0 | 0 | 0 | 0 | Rogers Wireless, Microcell, Bell Canada |
| U.S. | | | | | | | | | |
| AT&T | Fixed/mobile | Sep-03 | 25,356 | 24,084 | 24,950 | 25,627 | 27,448 | 29,000 | None |
| Ethostream | Startup | 2001 | 2,336 | 2,356 | 2,320 | 2,297 | 2,256 | 2,200 | |
| Airpath | Startup | Sep-01 | 2,111 | 1,938 | 1,930 | 1,930 | 1,927 | 1,920 | Sprint Nextel, AT&T, Fatport, BT, PCCW, SingTel, iPass |
| T-Mobile USA | Mobile | Jan-02 | 1,956 | 1,956 | 1,750 | 1,559 | 1,475 | 1,400 | T-Mobile Europe, WBA* |
| Tengo Internet | Startup | 2001 | 900 | 910 | 920 | 930 | 940 | 1,000 | Acquired Nomad ISP Dec-09 |
| STSN/iBAHN | Startup | Mar-03 | 928 | 876 | 872 | 872 | 877 | 900 | Boingo, iPass |
| LodgeNet | Startup | Jan-01e | 498 | 498 | 498 | 498 | 498 | 498 | iPass |
| InnFlux | Startup | 2003 | 243 | 243 | 243 | 243 | 243 | 243 | None |
| Surf n Sip | Startup | 37043 | 160 | 160 | 160 | 160 | 160 | 160 | Fatport |
| V-Link | Startup | Jun-05 | 115 | 115 | 115 | 115 | 115 | 115 | None |
| WiFiFee (Deep Blue) | Startup | Mar-02 | 95 | 95 | 95 | 95 | 95 | 95 | iPass, Boingo, Pronto |
| ICOA | Startup | Oct-03 | 85 | 85 | 85 | 85 | 85 | 85 | AT&T, Boingo, iPass |
| Western Europe | | | | | | | | | |
| Austria | | | | | | | | | |
| mobikom austria | Mobile | Apr-04 | 266 | 266 | 266 | 266 | 266 | 266 | None |
| T-Mobile/Metronet | Mobile | Nov-02 | 163 | 179 | 179 | 179 | 179 | 179 | WBA* |
| Vorarlberg Online | ISP | Mid-02 | 147 | 147 | 147 | 147 | 147 | 147 | One |
| Belgium | | | | | | | | | |
| Telenet | Startup | Jul-03 | 1,171 | 1,135 | 1,130 | 1,130 | 1,129 | 1,150 | BT, iPass, Boingo |
| Belgacom | Fixed/mobile | Jun-03 | 860 | 816 | 805 | 793 | 793 | 780 | None |
| Orange | Mobile | Mid-05 | 54 | 53 | 53 | 53 | 53 | 53 | |
| Swisscom | Startup | Mar-03 | 34 | 33 | 33 | 33 | 33 | 33 | WBA*, Bouygues, TeliaSonera, Kubi, WeRoam |
| All Telecom | Startup | Aug-03 | 30 | 0 | 0 | 0 | 0 | 0 | TeliaSonera, iPass, O2 Germany |
| Denmark | | | | | | | | | |
| TDC | Fixed/mobile | Aug-02 | 630 | 630 | 630 | 630 | 630 | 630 | None |
| TeliaSonera | Mobile | Jun-05 | 209 | 209 | 209 | 209 | 209 | 209 | Swisscom, Orange, BT, Portugal Telecom, NTT DoCoMo |
| The Cloud | Startup | 4Q-06 | 190 | 132 | 132 | 135 | 135 | 150 | |
| Finland | | | | | | | | | |
| TeliaSonera | Fixed/mobile | Jun-00 | 218 | 218 | 218 | 218 | 218 | 218 | Swisscom, Orange, BT, Portugal Telecom, NTT DoCoMo |
| DNA/Wayport | Mobile | May-03 | 21 | 21 | 21 | 77 | 77 | 77 | Kubi, Monzoon |
| eService Bar | Startup | Sep-03 | 18 | 13 | 13 | 13 | 13 | 13 | |
| France | | | | | | | | | |
| Orange France | Mobile | Feb-03 | 14,882 | 14,860 | 14,860 | 12,500 | 11,172 | 11,000 | WBA*, Wifirst, SFR, Bouygues, WeRoam |
| Meteor Networks | Startup | Jul-03 | 1,376 | 1,453 | 1,453 | 1,453 | 1,488 | 1,600 | Boingo, iPass, WeRoam, RoamPoint, Excilan, T-Systems |
| SFR | Mobile | Feb-03 | 381 | 380 | 380 | 380 | 380 | 380 | |
| Swisscom | Startup | Mar-03 | 214 | 213 | 213 | 213 | 213 | 213 | Orange, Meteor Networks, All Telecom, Boingo |

| Operator | Type | Commercial PWLAN launch | End-4Q09 | End-1Q10 | End-2Q10 | End-3Q10 | End-4Q10 | End-4Q11e | Selected roaming agreements |
|------------------------|--------------|-------------------------|----------|----------|----------|----------|----------|-----------|---|
| France (cont'd) | | | | | | | | | None |
| Daclem | Startup | Nov-02 | 57 | 57 | 57 | 57 | 57 | 57 | TeliaSonera, iPass, O2 Germany |
| All Telecom | Startup | Aug-03 | 182 | 182 | 0 | 0 | 0 | 0 | Orange, SFR, Meteor Networks, All Telecom, Bouygues |
| Germany | | | | | | | | | One, Wifirst, iPass, Boingo |
| T-Mobile/T-Com | Mobile | Nov-02 | 6,674 | 6,674 | 6,674 | 6,674 | 6,674 | 6,674 | WBA* |
| The Cloud | Startup | Jun-03 | 857 | 800 | 800 | 784 | 783 | 750 | Vodafone D2, E-Plus, WeRoam, iPass, Boingo |
| M3 Connect | Startup | Jun-02 | 369 | 375 | 378 | 378 | 349 | 349 | |
| Hotspot Deutschland | Startup | May-04 | 317 | 317 | 316 | 316 | 316 | 316 | T-Mobile/T-Com, iPass |
| Vodafone D2 | Mobile | Mar-03 | 296 | 296 | 296 | 296 | 296 | 296 | None |
| Swisscom | Startup | Mar-03 | 304 | 287 | 287 | 287 | 287 | 287 | O2 Germany, The Cloud |
| Telenet | Startup | 2005 | 225 | 225 | 225 | 225 | 225 | 225 | O2 Germany, TeliaSonera, iPass |
| BerlinNet/Versatel | Startup | Mid-03 | 85 | 85 | 85 | 85 | 85 | 85 | iPass, Boingo |
| Greece | | | | | | | | | Portugal Telecom, Monsoon, ISIS, WeRoam, WINGS |
| FORTHnet | ISP | 2003 | 291 | 313 | 320 | 332 | 348 | 380 | Portugal Telecom, WINGS, Boingo |
| Ireland | | | | | | | | | None |
| eircom | Fixed | Feb-04 | 739 | 689 | 685 | 682 | 682 | 680 | |
| BitBuzz | Startup | Jan-04 | 176 | 180 | 185 | 189 | 192 | 200 | WeRoam, iPass, Boingo |
| Esat BT | Fixed | Feb-03 | 50 | 64 | 64 | 64 | 60 | 60 | |
| Italy | | | | | | | | | WBA*, TeliaSonera, iPass |
| Linkem | Startup | Jun-03 | 605 | 609 | 604 | 598 | 586 | 560 | Telecom Italia, TeliaSonera, Kubi, iPass |
| Telecom Italia | Fixed/mobile | Oct-03 | 668 | 578 | 552 | 532 | 531 | 531 | WBA* |
| Swisscom | Startup | Jan-04 | 200 | 216 | 216 | 216 | 216 | 216 | TeliaSonera, iPass, O2 Germany |
| Micso | Startup | 2003 | 96 | 96 | 96 | 99 | 99 | 99 | Portugal Telecom, WINGS |
| Hiport | Startup | 2002 | 120 | 120 | 84 | 84 | 84 | 84 | None |
| Netherlands | | | | | | | | | |
| KPN HubHop | Fixed/mobile | May-03 | 906 | 973 | 985 | 993 | 993 | 1,000 | Portugal Telecom, Picopoint, Boingo, iPass |
| T-Mobile | Mobile | Mar-04 | 687 | 592 | 586 | 578 | 553 | 520 | WBA* |
| Swisscom | Startup | Mar-03 | 102 | 102 | 102 | 102 | 102 | 102 | |
| Norway | | | | | | | | | TeliaSonera, iPass, O2 Germany |
| Telenor | Fixed/mobile | Feb-01 | 460 | 460 | 420 | 330 | 330 | 330 | The Cloud, Wayport |
| TeliaSonera | Fixed/mobile | Oct-99 | 111 | 111 | 111 | 111 | 111 | 111 | Swisscom, Orange, BT, Megabeam, Portugal Telecom, NetPower, Kubi, NTT DoCoMo, Yes!Hotspot |
| Wayport (NetPower) | Startup | Apr-03 | 69 | 69 | 56 | 56 | 56 | 56 | |
| The Cloud | Startup | 4Q-06 | 85 | 23 | 25 | 25 | 25 | 25 | Telenor, TeliaSonera, iPass/GoRemote |
| Portugal | | | | | | | | | BT, O2, Telenor, iPass, Boingo, WeRoam, PicoPoint |
| Portugal Telecom | Fixed/mobile | Mid-03 | 1,554 | 1,570 | 1,570 | 1,570 | 1,570 | 1,570 | WBA* |
| Vodafone Portugal | Mobile | Oct-03 | 120 | 120 | 120 | 120 | 120 | 120 | Swisscom, SFR |
| Spain | | | | | | | | | |
| Telefonica | Fixed/mobile | Jun-03 | 1,691 | 2,266 | 2,242 | 2,217 | 2,196 | 2,150 | WBA* |
| AWA Hotspot | Startup | 2001 | 1,034 | 311 | 300 | 295 | 298 | 320 | WeRoam, Trustive, Boingo |
| Kubi Wireless | Startup | Feb-02 | 251 | 250 | 242 | 242 | 251 | 270 | |
| Swisscom | Fixed/mobile | Jul-03 | 153 | 152 | 153 | 153 | 153 | 153 | TeliaSonera, Orange, Fatport, Monsoon, Boingo, iPass |
| Sweden | | | | | | | | | TeliaSonera, iPass, O2 Germany |
| TeliaSonera | Fixed/mobile | Oct-99 | 634 | 638 | 638 | 640 | 670 | 680 | Swisscom, Orange, BT, Portugal Telecom, NTT DoCoMo |
| The Cloud | Startup | Nov-04 | 309 | 330 | 350 | 382 | 382 | 400 | BT, O2, Telenor, iPass, Boingo, WeRoam, PicoPoint |
| Switzerland | | | | | | | | | |
| Swisscom Mobile | Mobile | Dec-02 | 1,187 | 1,301 | 1,297 | 1,297 | 1,297 | 1,297 | WBA* |
| Monsoon | Startup | Aug-01 | 693 | 698 | 735 | 760 | 773 | 800 | sunrise, Kubi, BT, WeRoam, iPass, Boingo |
| The Net | ISP | Oct-02 | 127 | 127 | 127 | 127 | 127 | 127 | |

| Operator | Type | Commercial PWLAN launch | End-4Q09 | End-1Q10 | End-2Q10 | End-3Q10 | End-4Q10 | End-4Q11e | Selected roaming agreements |
|-----------------------------|--------------|-------------------------|----------|----------|----------|----------|----------|-----------|--------------------------------|
| Switzerland (cont'd) | | | | | | | | | |
| TPN | Startup | Mid-03 | 0 | 0 | 0 | 0 | 0 | 0 | None |
| Turkey | | | | | | | | | |
| TNet | ISP | NA | 6,200 | 7,193 | 8,109 | 8,355 | 8,011 | 8,000 | iPass |
| U.K. | | | | | | | | | |
| The Cloud | Startup | May-03 | 4,213 | 3,586 | 3,950 | 4,100 | 4,085 | 4,000 | WBA* |
| BT Openzone | Fixed/mobile | Aug-02 | 3,698 | 3,768 | 3,820 | 3,866 | 3,876 | 4,000 | BT Openzone |
| Spectrum | Startup | Aug-02 | 1,050 | 1,050 | 1,050 | 1,050 | 1,050 | 1,050 | |
| Swisscom | Fixed/mobile | Mar-03 | 474 | 466 | 466 | 466 | 466 | 466 | TeliaSonera, O2 Germany, iPass |
| T-Mobile UK | Mobile | Aug-02 | 588 | 587 | 373 | 373 | 373 | 373 | WBA* |
| iBAHN | Startup | 2002 | 230 | 237 | 235 | 235 | 235 | 235 | BT Openzone |
| Orange | Mobile | Dec-05 | 72 | 72 | 72 | 72 | 71 | 71 | WBA* |
| Surf n Sip | Startup | Mid-03 | 0 | 0 | 0 | 0 | 0 | 0 | None |

Notes: Statistics cover only the largest hotspot operators in the major national markets in Western Europe, Asia Pacific and North America. Other regions are not included. Only paid-for hotspots are included in the database; locations offering free access are not covered. 4Q-2011 statistics are estimates. *Wireless Broadband Alliance members include: BT Openzone, China Netcom, ePLDT, Hong Kong CSL, Indosat M2, Korea Telecom, Maxis, NTT Communications, Orange, Portugal Telecom, StarHub, Swisscom Mobile, Tata/VSNL, T-Com, Telecom Italia, Telefonica, Telmex, Telstra, T-Mobile, True.

Source: Informa Telecoms & Media

NEWS

Spectrum

O2 plans capex increase

UK operator O2 is planning to double its CAPEX spending to up to £2 million (US\$3.19 million) a day in order to migrate its 3G customers to the 900MHz band after regulator Ofcom agreed to the refarming of the spectrum. The move is seen to improve the quality of service given to its iPhone and dongles users.

Cofetel to release spectrum for mobile broadband

Mexico's federal commission of telecommunications (Cofetel) will provide a clear guideline by the end of February on the renewal of licenses to exploit 2.5GHz spectrum, which is currently used by WiMAX operators MVS and Ultravision. In addition, Cofetel, which is keen to efficiently deploy spectrum suitable for mobile broadband, will auction a further 138MHz of spectrum, of which 100MHz is available in 700MHz, and 30MHz available on 1.7GHz. As for 3.5GHz, the president of Cofetel Mony de Swan said that at present there is no demand from operators.

Colombia reviews spectrum caps

A new decree by Colombia's ministry of information technologies and communications (MINTIC) increases the cap of spectrum to be awarded to mobile operators. A public consultation is now open before new rules are passed. The new decree sets a 60Mhz cap for spectrum in 1,710 MHz to 1,770 MHz and 2,110 MHz to 2,170 MHz, bands and a 30Mhz cap for spectrum in lower bands (between 698 MHz and 960 MHz). As for spectrum between 2.5GHz and 2.69Ghz, the cap will be of 80MHz for higher bands and 30Mhz for lower bands.

Ofcom to allow spectrum trading

UK regulator Ofcom has put forward proposals to allow mobile operators for the first time to trade spectrum. Under the proposals, which cover spectrum at 900MHz, 1800MHz and 2100MHz, operators with a greater need for spectrum will be able to make offers for spectrum from those who need it less. It is hoped that this added flexibility will help operators to respond more quickly to demand. By allowing operators to trade their spectrum, Ofcom believes that there will be greater opportunity to use it more efficiently. Ultimately, it is believed that this will bring benefits to citizens and consumers in terms of improved mobile services.

NTIA evaluating more spectrum for commercial use

The National Telecommunications & Information Administration (NTIA) has chosen the 1755 MHz – 1850 MHz spectrum band as the next for evaluation for commercial use, as part of the larger goal of the National Broadband Plan in making more commercial spectrum available for broadband in the next decade. The band is currently used by the Department of Defense, federal law enforcement agencies and more for such uses as satellite and surveillance

UMTS

Play details 3G network developments

Polish mobile operator Play (P4) has reported that its UMTS2100 MHz network covers 16% of the Polish territory and over 60% of the country's population. The operator plans to cover more than 60% of Poland's territory and over 80% of its population by April using a UMTS2100MHz/900MHz network. The operator's UMTS900MHz network currently has 300 operational transmitters, and additionally HSPA+ has been implemented across all of these transmitters within the 900MHz band, as well as in over 4,000 transmitters across the operator's UMTS2100MHz network.

Airtel launches 3G in Karnataka

Indian cellular operator Bharti Airtel has announced its first launch of WCDMA services in India. It has launched WCDMA services on its HSPA network in the state of Karnataka and plans to have launched in all 13 telecom regions in which it has 3G licenses by Mar. 31. Its 3G tariff plans include time-based plans for light users of data where usage and billing is by hour and Flexi-shield plans for heavy users of data where usage and billing is capped. In the Flexi-Shield plans unlimited browsing is free after hitting the shield value of INR2,000 (US \$44). The Flexi-Shield plan costs INR675 for 1.25GB and above that is charged at INR0.01 per 100KB (until the INR2,000 shield).

TOT awards Samart-led consortium 3G network contract

SL Consortium, a group consisting of Thai telecoms companies – Samart Telecom and Loxley Wireless, has won the auction for the contract to build out state-owned TOT's 3G network infrastructure with a bid of THB16.29 billion (US\$515.38 million). The figure undercut the reserve price by 6.6% and enabled the group to beat out competition from Ericsson, ZTE and another Thai consortium headed by the market's leading mobile operator, AIS. The board of TOT is expected to formally approve the agreement by mid-February. Under the terms of the contract, THB17.44 billion will be allocated to the procurement of network equipment, THB2 billion will be used for works related to enhancement of TOT's existing 3G networks in Bangkok, and the remaining THB540 million will be kept as reserve.

Telcel blames Nextel for 3G interference

Mexico's federal commission of telecommunications (Cofetel) has asked mobile operators Telcel, a unit of America Movil, and Nextel, a unit of NII Holdings, to find a solution to the network interference issues that have recently affected Telcel's 3G network. Since last November, according to reports, Telcel has had interference issues with its 3G service and is blaming Nextel for the problems. Nextel is currently rolling out a new 3G network after winning a license to operate nationwide.

HSPA**PTC plans for 61% HSPA+ Polish population coverage**

Polish mobile operator, PTC, is planning to ensure that its HSPA+ network, which provides data download speeds of up to 42Mbps, covers 61% of Poland's population over 2011, according to PTC President Miroslav Rakowski. Previously in September-'09 PTC launched HSPA+.

Cellular One launches HSPA+ in Bermuda

Bermuda Digital Communications upgraded its Cellular One HSPA network to HSPA+ 21 Mbps. The operator indicated it achieved data transmission speeds of between 10 Mbps and 12 Mbps. Although the upgrade has been made, it has no compatible devices at this time, but hopes to offer them later this year. Bermuda Digital Communications will also deploy LTE in the future.

MTS tests speeds up to 42Mb/sec in Moscow

Leading Russian and CIS operator, MTS has successfully tested HSPA+ in Moscow, offering speeds of up to 42Mb/sec. MTS plans to commercially deploy HSPA+ in Moscow in April 2011. By end-2011, HSPA+ will be supported by all MTS 3G indoor base stations. According to MTS, the increased speeds will greatly increase the quality of its Moscow 3G network, enabling subscribers to view HD-Video and quickly download large multimedia files.

Vodafone upgrades HSPA download speeds

Greek mobile operator, Vodafone, has increased its HSPA mobile data download speeds to 42.2 Mbps by deploying Dual Carrier HSPA+ technology. The upgraded speeds are available in select regions of Athens and can be accessed with the operator's K4605 USB stick.

STC launches dual-carrier HSPA+

Saudi incumbent STC said it has launched a dual-carrier HSPA+ network that covers eight cities in the country and offers data speeds of up to 42Mbps. STC is using equipment from Novatel Wireless for the network, which is designed to provide higher data rates to users.

Telus bringing HSPA to Manitoba

Telus will expand its HSPA presence to the province of Manitoba beginning in February. Telus first launched HSPA in November 2009 using Nokia Siemens Networks and Huawei equipment. The operator now runs CDMA, iDEN and HSPA networks.

MTS Mobility launching HSPA+ in March

Canadian regional operator MTS Mobility will launch its HSPA+ network, covering 97% of Manitoba's population, March 31. MTS Mobility is the last of the Canadian CDMA operators to launch HSPA+. Bell Mobility, Telus Mobility and Sasktel Mobility have all launched HSPA+. In July 2009, MTS Mobility signed an agreement with national operator Rogers Wireless to share the costs of deploying the network in Manitoba. MTS Mobility customers will be able to roam nationally using Rogers' network.

Elisa expands HSPA network to Rapla

Estonian mobile operator, Elisa, has expanded its HSPA network to the county of Rapla. The operator's HSPA network currently reaches more than 1.1 million residents in Estonia and covers more than half of the country. Recently Elisa expanded its HSPA network in six new counties of Estonia. The operator also reports that over 32% of its mobile internet users use

their handsets to access the internet. Sami Seppanen, CEO of Elisa Estonia, also states that the operator's HSPA network produces, on average, download speeds of around two to seven megabits per second. Seppanen also stated that Elisa's HSPA network provided the best indoor coverage compared with indoor HSPA coverage of its rivals, due to its UMTS900MHz network's signal strength. The operator's UMTS900MHz network launched in January-'08.

Glo expands HSPA to Northern Nigeria

Nigerian Glo Mobile expanded 3G/HSPA coverage to the Northern city of Kaduna. Launched in 2008, Glo's 3G network was mainly available in capital city Abuja and Southern cities of Lagos, Ibadan, Benin City and Port-Harcourt.

Tele2 HSPA network reaches 60% of Estonia

Estonian mobile operator, Tele2, has said that data traffic across its mobile networks increased by almost twelve times year-on-year to end December-'10. The operator also revealed that one out of every three phones sold by the operator during 2010 was a smartphone. The operator's HSPA network reaches over 60% of Estonia's territory.

LTE

Cyfrowy Polsat details LTE, HSPA+ plans

Polish pay TV operator Cyfrowy Polsat plans to conduct LTE tests, according to its President, Dominik Libicki. At end December-'10 the operator also reported a total of 25,000 HSPA+ users. In February-'11 Cyfrowy Polsat plans to allow a select number of its subscribers to test LTE data speeds free of charge, for half a year. Subscribers in the LTE test trial will be able to access 100GB of data transfer. Libicki also states that the price differential between LTE and HSPA+ in Cyfrowy Polsat's future mobile internet access offers will not differ. Cyfrowy Polsat also plans to introduce dual LTE and HSPA+ functioning modems in the future, and plans for its HSPA+ network to cover around 40-50% of Poland's population by end February-'11.

LightSquared accelerating LTE network plans

LightSquared has told its partner Inmarsat to start Phase 2 of 2 of their Cooperation Agreement, in which Inmarsat is to make additional spectrum available to LightSquared for US\$115 million the first year and 3% rate increase each year. The move follows LightSquared's important waiver from the FCC allowing it to operate terrestrial-only devices on its future wholesale LTE network. LightSquared CEO Sanjiv Ahuja indicated strong demand for its LTE wholesale network caused the company to accelerate the launch of Phase 2. When this is complete, LightSquared will be able to use up to 59 MHz of terrestrial and L-Band ATC spectrum in the US and Canada. The Cooperation Agreement was struck in 2007 to increase the amount of contiguous spectrum available to both companies and to provide LightSquared more operational flexibility in deploying its network. Phase 1 was launched in August 2010.

Peru to open LTE bidding auction in June

Peruvian regulator Osiptel plans to open the bidding process for the 700MHz frequency, which will enable operators to offer 4G services, in June.

ICE plans LTE by 2013

Costa Rican state-owned operator ICE intends to introduce LTE services by 2013. The operator plans to have an overall capacity of 550,000 LTE lines by then. IOCE estimates that the cost to roll out LTE will top US\$73.8 million with the network deployment starting from urban areas with high data usage.

Netcom launches LTE in three further cities

Norwegian operator Netcom, owned by TeliaSonera, has extended its LTE coverage in the country by launching in three new cities. LTE will now be available in Trondheim, Bergen and Stavanger, which follows coverage in Oslo at launch in December 2009. Netcom expects that LTE will cover up to 89% of the country's population by the end of 2011.

Orange conducts LTE test in Dominican Republic

Mobile operator Orange Dominicana, the Dominican subsidiary of France Telecom, conducted an LTE test last week in its R&D lab. Olaf Swantee, the vice president of France Telecom, attended the demonstration, the first of its kind in the country. The executive said that this year Orange plans to expand its operations and that it will double its workforce in the Dominican Republic.

Wind completes LTE trials

Canadian new entrant Wind Mobile completed LTE trials, where test users experienced speeds of 50 Mbps – 60 Mbps and improved speed while multitasking. Wind currently operators an HSPA network.

LTE-Advanced

NTT DoCoMo to commence field trials of LTE-Advanced

Japan's largest mobile operator, NTT DoCoMo, plans to begin field experiments of LTE-Advanced - a new version of LTE, which it considers to be a true 4G technology – under real mobile operating conditions in the cities of Yokosuka and Sagami-hara. The company was pre-licensed by the national telecommunications regulator to conduct the trial in late January 2011 and is currently awaiting the actual trial license. NTT DoCoMo was able to achieve a downlink transmission speed of approximately 1 Gbps and an uplink speed of 200 Mbps in previous tests using radio environment simulators in its R&D center. At present, standardization of LTE-Advanced is being finalized by the 3rd Generation Partnership Project (3GPP).

Infrastructure

AIS details 2011 capital expenditure

Thailand's largest mobile operator, AIS, is planning to invest a total of THB10billion (US \$322.4million) in network expansion and capacity enhancement in 2011, which represents an increase of 65% from the level last year. A quarter of the budget has been allocated to works related to the expansion of its HSPA network on the 900MHz spectrum, including the installation of 1,884 new base stations in Bangkok and adjacent central provinces, Chiang Mai, Nakhon Ratchasima, Khon Kaen, Chon Buri, Hua Hin, Nakhon Pathom and Phuket. This will be an interim measure to cope with the demand for high-speed data service until the licences for the 2100MHz are issued.

LG U+ details data network plan

Korea's third largest mobile operator, LG U+, will invest KRW1.116trillion (US\$995million) in 2011 on enhancing its network infrastructure including the construction of its new LTE network. The company plans to launch the LTE network in 3Q11. In addition, to accommodate the rapidly growing data traffic from smartphone and tablet compute users, LG U+ has been actively rolling out Wi-Fi hotspots to offload mobile data on commercial premises and public places nationwide. It plans to install 25,000 Wi-Fi zones by March and 50,000 by year-end 2011.

STC eyes towers merger and sale

Saudi incumbent STC is considering merging its telecom towers assets with those of No. 2 operator Mobily before selling a stake in the merged tower business, according to reports. The two operators would have a combined total of 14,500 towers. STC previously invited offers for its own 11,000 towers, and had shortlisted two bidders.

Support Systems

Digitel implements e-billing

Venezuelan mobile operator Digitel has selected Oracle to provide a new e-billing solution. This effort is part of an initiative to comply with the country's new tax requirements by reducing the delivery time of customer invoices by 90%. Digitel's customers will no longer receive paper bills but will be instead able to access their bills online within 48 hours.

Ncell selects AIRCOM to improve performance management

UK independent network planning and optimisation solutions provider AIRCOM says that Nepali GSM/WCDMA operator Ncell has selected its Optima tool for network performance management for different parts of its operational processes. This includes business support, radio and core transmission, packet communication, value added services, network systems and technologies. The rollout of Optima will be completed in two phases. Ncell will also Optima alongside other installed Aircom tools, Asset, Connect and Ranopt. Asset is used for multi-technology radio planning. CONNECT is used for microwave and backhaul planning. Ranopt is used for drive test data post processing.

STC, Aegis partner for customer care

Saudi incumbent STC is to set up a joint venture with Aegis, part of India's Essar Group, to handle all of the Saudi operator's customer-care activities, including billing and directory enquiries. STC will hold 50% plus one share in the joint venture, called Call Centre Company.

Licensing**Peru to get fourth mobile player**

Vietnamese mobile operator Viettel won a mobile license in the Band C auction in Peru, joining cellcos Claro, Movistar and Nextel. Viettel bid US\$1.3million for 25MHz of spectrum in 1,900MHz band. Although bids from Americatel and Winner Systems were close to Viettel's bid, their offer to provide broadband services to public schools were lower. Providing free broadband services to public schools was one of the conditions of the bidding process. Viettel plans to provide mobile services in a minimum of five provinces with a capacity for 15,000 in the first year of operation and at least 338,000 lines in the fifth year. The company plans to invest US\$27 million, which includes the license and network deployment.

Eight companies interested in Colombia sub-auction

After Colombia's ministry of ITC (Mintic) announced an increase in spectrum caps from 55Mhz to 60Mhz in the 1,900Mhz band, and eight companies expressed interest in acquiring new spectrum. Potential bidders include existing mobile operators Comcel, Movistar and Tigo, iDEN operator Avantel, fixed line operators UNE, ETB, satellite TV provider DirectTV, but also non telecoms companies Logistica Postal, Carga Andina and Dominio Colombia. The government plans to auction 30 MHz of spectrum in the 1,900 MHz band by June this year along with blocks of spectrum in the bands of 1,700, 2,100 and 2,500 MHz for next generation mobile services.

Syria sets auction date for third mobile license

The Syrian Ministry of Telecommunications will hold the auction for the country's' third mobile license in April 2011. The starting bid is set at US\$122.2 million. Five operators have pre qualified to bid for the license- Turkcell, France Telecom, Saudi Telecom Company, Etisalat and Qtel. The license will be awarded with the requirement that 25% of the operators' annual mobile revenues will be given to the government and that Syria's state telecoms company, STE, will hold a 20% stake in the new mobile operator.

Managed services**Du hands IT work to Ericsson**

The UAE's No. 2 operator Du has handed Ericsson a new five-year managed services agreement that extends Ericsson's remit at Du to include the development and maintenance of IT applications such as billing.

Wi-Fi**O2 UK ramps up Wi-Fi network**

UK operator O2 plans to deploy a market-changing public Wi-Fi platform in the UK, with the launch of O2 Wi-Fi. O2's premium hotspots will be managed through partnerships with key venue owners and will be open for all customers to access for free, no matter which mobile or broadband provider they are with. The move signals operators' re-emerging focus on Wi-Fi as a way to enhance broadband mobility coverage and quality and also to offload traffic from cellular networks, thereby alleviating congestion on them. O2 is aiming to create a scaled Wi-Fi platform that will be at least double the number of premium hotspots currently offered by BT Openzone and The Cloud combined by 2013. It will begin rollout immediately by replacing its existing 450 Cloud hotspots in its retail and office estate. It will continue to extend the reach and scale of O2 Wi-Fi through partnerships with strategic venues, to include shops, restaurants, retail outlets and outdoor and indoor locations across the UK.

WiMAX**Sprint introduces international 4G roaming**

US mobile network operator and WiMAX mobile virtual network operator Sprint Nextel now offers mobile WiMAX roaming on Digicel's network in Jamaica and Global Mobile's network in Taiwan. Compatible devices for this international roaming include Sprint 4G devices, such as Sprint 3G/4G U600 USB Modem, with Sprint SmartView Connection Manager, which will automatically detect Digicel or Global Mobile's network. The cost of roaming is US\$14.00 for an unlimited, 24-hour daypass.

Vendor strategy

Ericsson's 4Q10 boosted by mobile broadband

Swedish vendor Ericsson reported an 8% increase in sales in 4Q10 to SEK62.8 billion (US\$9.53 billion), boosted by a strong development in mobile broadband.

Net sales for the year were more or less flat, decreasing by 2% to SEK203.3 billion. Gross margin for the year was 38%, an increase of 2pp compared to 2009, while the EBITDA margin excluding JV was flat at 14%. Net income almost trebled during 2010, reaching SEK11.2 billion. Looking at the different segments, sales in networks increased by 14% in 4Q10 year-on-year, driven by the demand for mobile broadband and 2G investments in China, while sales in Global Services decreased by 1% year-on-year in 4Q10 as a result of lower levels of network rollout. Looking at the full year, networks sales decreased by 1% at SEK112.7 billion, for an increasing margin of 18%, while Global Services sales increased by 1% to SEK80.1 billion, with a stable margin of 12%.

O2 UK taps Ericsson

Swedish vendor Ericsson has been selected to perform a substantial network modernization program for UK operator O2 in the north of the UK. The partnership will deliver greater coverage, voice and data capacity for O2 customers via a new generation network, specifically designed to handle significant growth in smartphones and smartphone applications. Ericsson will deploy state of the art multi-standard base stations and be the sole supplier of the core network infrastructure. The latter will include the latest high capacity Mobile Softswitch Solution, using blade technology, that will allow O2 to achieve operational efficiencies and greater flexibility in the management and operation of their UK network.

ZTE sees 2010 revenues up 16.7%

Chinese equipment vendor ZTE Corporation announced its 2010 preliminary financial results, with revenue from principal operators approximately US\$19.62 billion, up by 16.7% over 2009. Net profit attributable to shareholders was US\$491.3 million, up by 32.4% over 2009. ZTE attributes its increase in net profit to sales growth and recognition of investment income from the listing for one of the company's associates, Nationz Technologies Inc, by way of an IPO.

Alcatel-Lucent introduces new BTS technology

French vendor Alcatel-Lucent launched a new architecture where the base station, typically located at the base of each cell site tower, is broken into its component elements and then distributed into the antenna and throughout a cloud-like network, called lightRadio. The vendor has agreements with France Telecom, Verizon and China Mobile for the technology.

Wi-Fi hotspots could be the next land grab, says Mark Newman

Mark Newman

When the mobile industry became aware of the potential of HSPA to offer high speed mobile broadband services more than five years ago, the key protagonists – mobile operators and network infrastructure vendors – decided that this would inevitably mean the end of the public Wi-Fi business model.

It coincided with the demise of the municipal Wi-Fi concept as mobile operators – seeing this as a threat to their business – succeeded in persuading government bodies that it could represent a threat to their business. Lukewarm customer feedback to muni-Wi-Fi and, in some cases, under-funded networks and services were another factor behind their demise.

It was the launch of the 2G iPhone that transformed the fortunes of public Wi-Fi. Lacking 3G connectivity, Apple decided that public Wi-Fi hotspots would increase the attractiveness of the iPhone service proposition. And even with the adoption of 3G, access to Wi-Fi hotspots is still one of the benefits associated with iPhones.

Mobile operators have latterly embraced Wi-Fi because it can help them to manage the explosion of data traffic on their networks. Some operators still have their own Wi-Fi hotspot businesses but others buy capacity from dedicated hotspot operators such as The Cloud or BT in the UK.

It is not just the mobile operators that can see the benefits of public Wi-Fi. Fixed telecoms operators are also looking to offer Wi-Fi as a complement to their triple-play services and to differentiate themselves. In the UK, pay-TV operators and broadband service provider Sky has moved to acquire The Cloud. Its motivation could either be to enhance its fixed broadband offering or to provide another platform for its Sky TV customers.

With so many different fixed and mobile broadband operators interested in using Wi-Fi to enhance their basic offerings it is worth speculating as to whether we will see a rush to acquire Wi-Fi hotspot assets in other countries and whether it is the mobile or fixed operator/service provider community that takes a lead.

The structure of the public Wi-Fi hotspot sector varies from country to country. Where there are large independent hotspot operators there is every chance that either fixed operators, cable companies, ISPs or mobile operators will see the opportunity to acquire an asset that allows it to differentiate the service that it offers from a competitor.

Whether such an acquisition makes sense in the longer term is another matter. Does Wi-Fi offer a genuine advantage over cellular for a mobile operator? Both require backhaul connectivity so it is really an issue of whether there is any inherent advantage in the radio. It makes perfect sense for a mobile operator to make use of Wi-Fi on an ad-hoc basis and wherever they face pressure points on their network.

But owning and operating a Wi-Fi hotspot business is a different matter altogether. Hotspot operators rely on a wholesale business model. In the UK, all mobile operators buy capacity from BT. But if a mobile operator was to buy a hotspot business it would have to be on the basis that it reserved usage for its own customers – otherwise what would be the point of taking ownership? And would the benefits that accrue to its business in terms of signing up new customers and retaining existing ones more than compensate for the loss of wholesale business?

In the UK, O2 announced that it planned to invest tens of millions of pounds rolling out its own Wi-Fi hotspot business just as news was emerging of Sky's interest in the Cloud. It is too early to tell whether O2 sees this as part of its wider mobile broadband network strategy or more of a marketing strategy aimed both at its customers and those its competitors.

It is perhaps telling that none of the leading network infrastructure vendors such as Ericsson, Huawei or NSN have yet made a foray into the Wi-Fi infrastructure business. They will, no

doubt, be keeping a close eye on the operators – their customers – as they offload traffic to Wi-Fi networks. But they will also be working with operators to deploy their own “small cell” solutions as an alternative to using Wi-Fi. Small cells are set to be one of the main solutions that vendors push at this year’s Mobile World Congress. And at a time when many operators globally are looking to outsource different parts of their network it would be unusual to start acquiring Wi-Fi hotspot networks.

The same argument could be made of fixed or cable operators. Sky has not historically been in the infrastructure business and its acquisition of the Cloud will – for the first time – see it operating a wireless network. But perhaps this is the point. It is inevitable that mobile operators will continue to broaden and deepen their cellular networks and so there would have to be a question about where a Wi-Fi business would fit into any medium to long-term network strategy. But for fixed operators or ISPs, a Wi-Fi hotspot business may be as close as they ever get to owning a wireless network.

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