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Article abstract:
Businesses are increasingly hungry for bandwidth. Businesses expect seamless wireless coverage bandwidth 3G and 4G mobile signals are severely attenuated indoors. Picocells and femtocells stations improve indoor coverage, but are limited to a single service. Businesses need in-building simultaneously handle multiple standards; only distributed antenna systems (DAS) currently do active DAS antenna networks and remote radio units deployed throughout a building amplify them from a nearby macro base station.

Article:
IBW
The stage is well set for an explosion in in-building wireless adoption within the Asia-Pacific region considering why, exactly, in-building wireless is needed - from the point of view of both business networks and to examine the potential costs of inadequate in-building coverage.

Businesses are using more and more bandwidth-hungry 'cloud' Web apps - applications which pull data from a net-based server, and hence consume a lot of bandwidth. Today's Asia-Pacific business increasingly mobile, with users moving from network to network, or site to site; they expect a rich experience whether indoors or out.

Increasingly, wideband mobile standards are enabling greater worker mobility; letting users take the building and into the wider world. However, there's a clear need for these services to be made in buildings as well.

The Asia-Pacific region has many places with hot climates; therefore workers tend to stay indoors during peak temperatures. In China alone, 60 per cent of 2G mobile voice/data traffic and 80 per cent of voice/data traffic occurs indoors, and this figure is even higher in certain regions.

More advanced mobile solutions such as 3G and 4G often have poor coverage indoors as RF signals are worse at these higher frequencies. Modern heavy steel and concrete, eco-friendly, and energy-efficient materials also cause high signal attenuation. Buildings in Asia Pacific, in particular, make heavy and/or tinted or polarised glass to deal with brightness levels higher than the global average.

The costs of slow data rates and coverage black spots in an enterprise can include decreased productivity, demotivation and a lack of competitiveness. Ultimately, difficulty getting reliable in-building coverage costs businesses money and can cost networks in lost revenue.

What do businesses need?
In addition to better indoor coverage, businesses have other very specific needs that can only be met by types of in-building wireless.

Critically, many of the solutions available for in-building wireless are 'single-service solutions'. T

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one type of wireless service such as WiFi or 3G.

Picocells and femtocells are tiny, low capacity, short-range base stations used in both business and residential applications. Femtocells, in particular, are one way for businesses to add extra cellular coverage in buildings. It is worth bearing in mind that these solutions are limited to cellular, single carrier services. For residential applications, they are not ideal for large spaces and public venues, which require a multi-service, multi-carrier solution.

Installing multiple single service solutions does not adequately overcome this limitation. Not only do they create significant interference issues, but it can also generate significant costs as different systems are installed in each other.

Businesses, therefore, require in-building wireless systems that can handle multiple standards and protocols, using the so-called 'multi-service' approach, which includes public safety.

To date there's only one family of in-building wireless products that can effectively achieve this: Distributed Antenna Systems (DAS).

Passive and active DAS typically consist of a network of antennas and remote units, deployed throughout the building, that amplify wireless signals from a nearby macro base station.

Passive DAS uses a network of coaxial cables, couplers and power splitters to distribute wireless signals throughout buildings. Passive DAS tends to use Ethernet cabling, and tends to be prone to signal die-off. It is a reasonably cost-effective and fairly popular option for smaller businesses.

However there are numerous limitations with passive DAS. It tends to be heavy and awkward to install, causing major disruption to the building. It also lacks remote monitoring, which increases maintenance costs. The cable used in passive DAS is leaky and the RF signal suffers from attenuation when transmitted over long distances, and can therefore only be effectively deployed in small scale projects.

Components within active DAS systems, on the other hand, actively monitor a system's performance to provide a better service and lowers maintenance costs. Active distributed antenna systems also require less cabling, achieving better signals.

Another critical consideration for businesses is whether their distributed antenna system is 'future-proofed'. Older systems leave no room to support new, higher frequency and throughput standards such as LTE, which could potentially cost a business its communications competitiveness.

Costs of inadequate IBW

A 21st century business is at a severe disadvantage if it fails to provide ubiquitous coverage for all its applications. In an office, for example, poor in-building wireless coverage will result in decreased responsiveness to customers, as well as staff frustration.

For hotels and retail outlets the cost of poor in-building wireless is decreased loyalty. Customers want locations where they can get a constant WiFi or mobile signal. According to a survey carried out by IBW, 54 per cent of travellers who cannot get adequate cell phone coverage at a hotel may never return.

On the other hand the ability to consistently use iPhones, Blackberrys, and so forth throughout a building, so on, can arguably radically increase productivity and reduce 'down time'.

In the case of in-building wireless the best way to avoid significant upgrade costs further down the line is to install an in-building system that is future-proofed and standards agnostic, supporting any number or combination of wireless services. In this way additional services can be added without additional cost.

There are also health and safety concerns for businesses to consider. Governing bodies worldwide have health and safety regulations in place that businesses must adhere to, stipulating that certain buildings must have reliable telecommunications throughout a structure. This is particularly true within industrial settings, where the environment that involves regular underground work, behind very thick walls, or in potentially hazardous conditions. Failure to provide adequate coverage for the full range of wireless services may cost a business dearly in terms of fines, litigation or, indeed, accidents.

Poor in-building wireless coverage also has more indirect costs for businesses - through insurance. Insurance companies tend to offer lower insurance premiums for buildings that deploy comprehensive communications systems, which, as noted, IBW makes possible by opening up clear lines of communication throughout areas of a building.

Lack of in-building wireless provision can have a significant environmental cost, which also translates into a monetary cost. Businesses may be using up to 35 per cent more electricity than they need to. By deploying a connected series of low cost wireless sensors around an in-building wireless network, lights on and off as staff move around a building, can radically reduce a company's carbon footprint. This is best implemented using distributed antenna systems; devices adhering to the Zigbee and Bluetooth protocols can use IBW systems to communicate with each other.

In fact, there is a variety of next-generation features that IBW can enable. Environmental sensors, low-power Zigbee radios, communicating via IBW, could, for example, be used to automatically detect and extinguish fires. They could also enable extensive building automation systems, carbon dioxide alarms, door sensors, and so forth.

RFID tags, connected to an IBW system can track assets, stock and staff within a building. This hospitals to track patients, or enable hotels to turn the lights on and off when a guest leaves th

The opportunities for increasing the efficiency of the business through use of emerging wireless numerous; however ubiquitous in-building wireless coverage is essential. The cost of inadequate wireless can be equally high for cellular network operators.

Cellular networks stand to make very good money from enterprise in-building wireless. Asia-Pa world's largest mobile phone market, with over 2.1 billion mobile phone subscriptions in 2009. average revenue per business user is well above that which they receive from consumers, and i consider ROI on in-building wireless systems to be more-or-less guaranteed.

In-building wireless offers networks the potential to increase the average revenue they receive services more useable and reliable, as well as allowing them to differentiate themselves from th reduce customer churn. Ineffective or absent provision of in-building wireless may cost network revenue.

If one thing is clear, whether businesses or networks foot the bill for in-building wireless, the co be the greatest cost of all. There is a clear and immediate need for Asia-Pacific businesses to in in-building wireless coverage to support rapidly evolving broadband requirements. Service prov owners and facility managers need to ensure that they are equipped to cope with the new emer technologies. Otherwise the main cost to Asia, ultimately, will be decreased communications an competitiveness.



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