

CISCO CONNECTED REAL ESTATE



CISCO CONNECTED REAL ESTATE UTILISES THE POWER OF THE INTERNET TO BRING HUGE FINANCIAL AND OPERATIONAL ADVANTAGES NOT ONLY TO THE KEY STAKEHOLDERS IN THE CONSTRUCTION, REAL ESTATE AND PROPERTY SERVICES INDUSTRIES, BUT ALSO TO CORPORATE TENANTS, HOTEL OPERATORS AND MULTIPLEXED RETAIL OUTLETS....

Architecture evolves with every decade, and the results are there for people's enjoyment. International recognition awaits those whose efforts take the art to new levels of attainment. The next revolution is occurring right now: although every bit as elegant as the external aspects of the buildings it complements, it is largely hidden from public gaze.

Cisco Connected Real Estate (CCRE) is the embodiment of that revolution. It harnesses the power of Internet Protocol (IP) to turn traditional building construction and management paradigms on their heads.

In so doing CCRE will bring huge financial and operational advantages not only to the construction, real estate and property services industries but also to downstream constituencies – such as hotel operators, multiplexed retail outlets, and corporate tenants – in sectors as diverse as leisure, healthcare, education and retail finance.

By adopting CCRE solutions building owners can offer new services to generate more revenue and reduce capital and operational expenditure. Occupiers can adopt highly flexible organisational models and benefit from faster set up and greater productivity. Guests and shoppers can take advantage of innovative services and enhanced amenities. And all stakeholders can enjoy safer and more secure workplaces and leisure outlets.

CONTENTS

1.0 The Cisco Connected Real Estate Opportunity	Page 4
2.0 Enabling New Revenue Streams Or Business Models	Page 6
3.0 Reducing Capital Expenditure And Operational Expenditure	Page 7
4.0 Creating More Productive And Flexible Workplaces	Page 8
5.0 Enhancing Health, Safety And Security	Page 8
6.0 Cisco Connected Real Estate Scenarios	Page 8
7.0 Cisco Connected Workplace	Page 9
Case Study: Cisco Systems, EMEA Region	Page 10
8.0 Cisco Connected Commercial Real Estate	Page 11
Case Study: SENTRE Partners, San Diego	Page 13
9.0 Cisco Connected Hotels	Page 13
Case Study: The Crowne Plaza Hotel, Dublin	Page 14
10.0 Cisco Connected Public Spaces	Page 15
Case Study: The Bullring, Birmingham	Page 16
11.0 Cisco Connected Construction	Page 17
12.0 Cisco Connected Real Estate Technology Overview	Page 18

NOTE:

In the generic sections of this white paper the word 'tenant' is used as shorthand for the users of a building whether they are – indeed – tenants or are companies, guests, shoppers, students or any one of the other identities that the users of a building can assume. Similarly, the term 'building owner' is used as shorthand for the owners, developers or managers of office buildings, hotels, universities, retail malls or any other state of stewardship of a public or private property.

The network as utility

Until recently, the network was acknowledged as merely pervasive but now, with the advent of Internet Protocol (IP), it has become ubiquitous. Today, global business and the public sector cannot operate without it. Real estate – from terraced houses and towering office blocks to shopping malls and sprawling airports – is all interconnected, as illustrated in **Figure 1**. In fact alongside water, gas and electricity the network has acquired its own utility status.

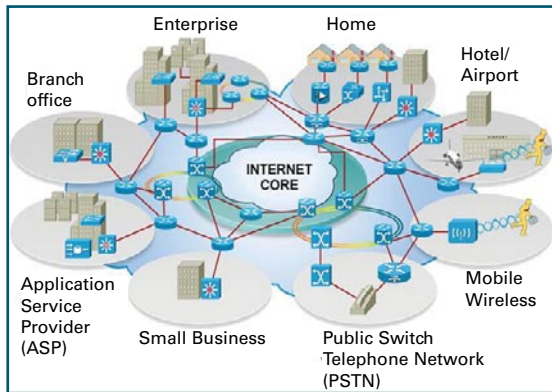


Figure 1: Ubiquitous networking

Cisco Connected Real Estate (CCRE) takes that network utility into the very foundation of modern buildings, driven by two rapidly coalescing market forces:

- The emergence of Ethernet-based multi-function building automation systems – bringing together separate applications such as heating, ventilation and air conditioning (HVAC), physical security and access, energy, lighting, and fire and safety.
- The convergence of multimedia voice, video and data services onto unitary IP-based infrastructures – bringing together separate technology-specific and proprietary networks.

As shown in **Figure 2**, convergence is driving the next evolutionary stage: the development of in-building and on-campus multi-service IP platforms that create value for key stakeholders in the real estate value chain.

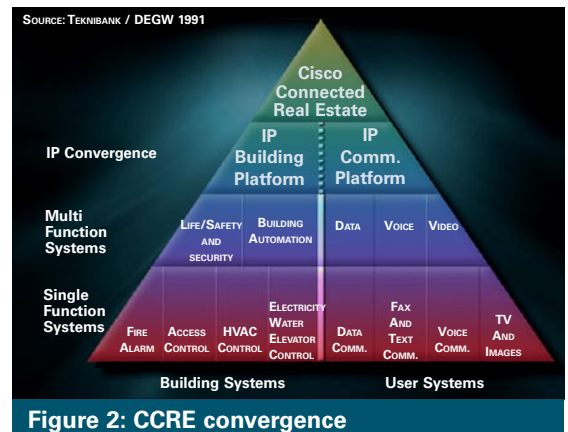


Figure 2: CCRE convergence

Towards The Connected Portfolio

The benefits of utilising building IP networks do not end with a single property. By extending such coherent IP infrastructures not only within buildings but also between buildings, CCRE offers new possibilities. For property owners, there is an incremental multiplier effect as more properties are connected together. Networked buildings can be linked together into a connected portfolio.

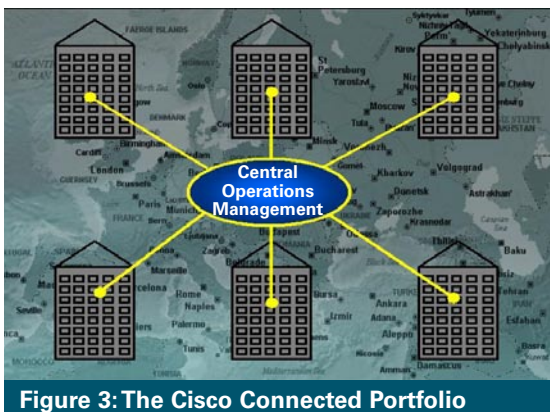


Figure 3: The Cisco Connected Portfolio

The open standards-based building infrastructure encourages a centralised (and/or remote) approach to monitoring, maintenance and control of the building environment, where building control systems across all properties can be controlled from a single place.

Cisco itself uses such an approach through its Security Operation Centre. As shown in **Figure 3**, it manages security, video surveillance and access control over the IP network, as well as monitoring several facilities systems including temperature control for the communications rooms, leak detection in the labs and universal power supply (UPS) supervision throughout its portfolio of 400 buildings across 90 countries.

Understanding The Building Lifecycle

A building lifecycle comprises four phases – conceptualise, design, construct, maintain and operate – as depicted in Figure 4.

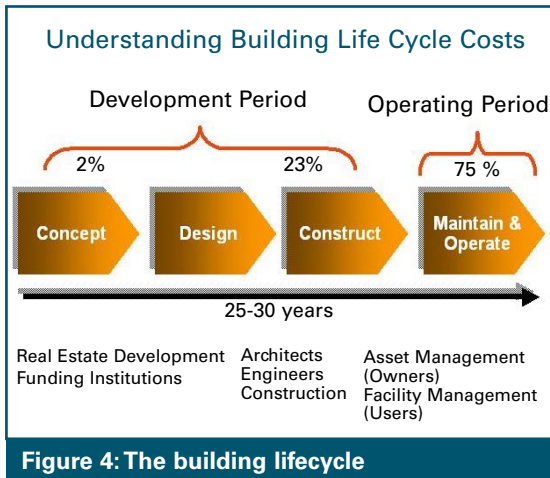


Figure 4: The building lifecycle

- **Conceptualise:** The phase in which the building is scoped and financed, conceptualisation consumes about two per cent of the total costs of the building lifecycle.
- **Design:** During the design phase, architects and engineers plan the detailed layout and the structure of the building.
- **Construct:** In the construct phase the building is erected to its design specifications. Together, the design and construct phases account for some 23 per cent of the total costs of the building lifecycle.
- **Maintain and Operate:** The maintain and operate phase represents the time during which the building is used, typically 25 to 30 years in today’s fast-moving environment. It accounts for 75 per cent of the total costs of the building lifecycle.

With three-quarters of the total expense of a building occurring during the maintain and operate period, rather than as initial capital expenditure, decisions taken in the design and construct phases can have far reaching financial and operational effects. Therefore during those phases key stakeholders should carefully consider a building’s network. Decisions made during the early stages can effectively create the levers that reduce ongoing operations costs over the lifecycle of the buildings, as well as improve the opportunity to create revenue streams in the appropriate markets.

The inclusion of a CCRE IP network in the building design process, and its installation as early as possible in the construction process, provides immediate gains for building owners. A CCRE IP network reduces capital costs during the construction process, because infrastructure can be laid more easily (rather than being retrofitted with consequent cost and disruption) and the single open standards cabling infrastructure reduces the requirement for multiple closed proprietary networks and the associated costs of installing them. Secondly, by installing networks early, building owners can extract value from the network over a longer period of time, increasing overall return on investment.

The Cisco Connected Real Estate Business Case

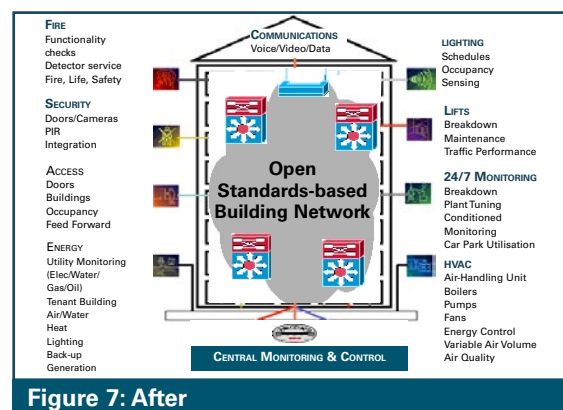
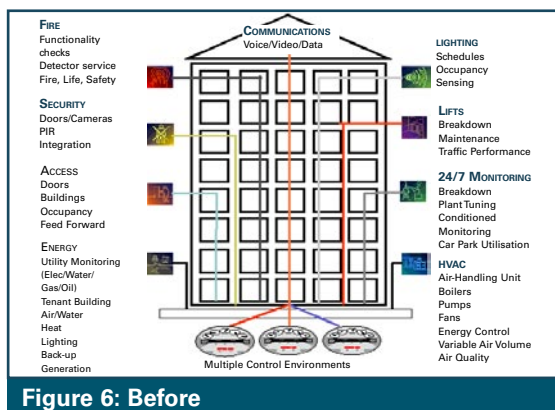
The business case for the CCRE framework is based upon the convergence of IT systems and building systems onto a single IP environment. This next wave of convergence creates new opportunities for key stakeholders in the building value chain as shown in Figure 5.



Figure 5: CCRE stakeholder value

The problem that CCRE addresses is that – as shown in **Figure 6** – currently most buildings and campuses today are constructed with multiple proprietary networks to run systems such as HVAC, security and access, energy, lighting, and fire and safety as well as separate voice and data telecommunications networks. As a result we see buildings that are complex to operate, with high installation, integration and ongoing maintenance costs, and limited automation functionality.

The CCRE framework promotes the convergence of these numerous networks onto the open standard of IP to streamline processes by providing a single connection for all building and IT systems, as shown in **Figure 7**.



This single IP network for communications (voice, video and data) enables the management and delivery of all key operational processes and tenant services in an efficient and centralised manner. Specifically, CCRE:

- Enables building owners to develop new revenue streams or business models.
- Reduces capital expenditure and operational expenditure for key stakeholders over the lifecycle of the building.
- Creates more productive and flexible workplaces using scalable tools that enable improved collaboration, mobility and remote connectivity.
- Enhances health, safety and security for a building’s occupants.

To provide a results-oriented focus to the CCRE debate, in the following sections we will distil the discussion into those four key areas of CCRE business benefit.

2.0 ENABLING BUILDING OWNERS TO DEVELOP NEW REVENUE STREAMS OR BUSINESS MODELS

In an uncertain economic environment, multi-tenanted building owners need to shift from their traditional role of building custodian to that of a service-centric building manager. They can then attract a more desirable tenant base and fill vacancies more easily, while driving down their costs.

CCRE delivers the enabling intelligent information network that creates a highly empowered building environment. It automatically and securely connects building owners and tenants to innovative amenities, applications and features that allow people to do things, better, faster and cheaper.

CCRE creates significant opportunities for building owners to generate new sources of revenue. Key tenant service offerings include:

- High-speed Internet access
- IP Telephony and unified communications
- Wireless/mobility solutions
- Network and physical security
- Control over their office environments.

Tenants benefit from differentiated bulk services – such as broadband – with lower costs and higher service levels. Additionally, real savings to tenants include reduced IT resource requirements, cheaper communications costs, faster service delivery, simplified partner management, and greater control over their environment.

3.0 REDUCING CAPITAL EXPENDITURE AND OPERATIONAL EXPENDITURE FOR KEY STAKEHOLDERS OVER THE LIFECYCLE OF THE BUILDING

CCRE can help reduce capital costs during the construction process – a single open standards cabling infrastructure reduces the requirement for multiple closed proprietary networks, and the associated costs of installing, maintaining and upgrading them. It also helps lower operating expenses over the building's lifecycle.

An open standards-based building infrastructure encourages a centralised (and/or remote) approach to monitoring, maintenance and control of the building environment.

Higher levels of connectivity between building systems provides an array of benefits through access to and sharing of real time data including:

- Optimised remote control, monitoring and reporting of building systems – including centralised management of a distributed property portfolio.
- Intelligent HVAC and lighting and cooling systems – leading to reduced costs through increased energy efficiency.
- Improved staff productivity (maintenance, facilities and security personnel) and enhanced Health & Safety compliance.
- Improved asset management and tracking – together with automated work scheduling, billing and help desks – linked to existing enterprise resource planning (ERP) systems.

The CCRE IP framework features embedded technologies that guarantee quality of service and high levels of security and resilience – further reducing maintenance and repair costs. Furthermore, all components of the network are built entirely on open standards. Hardware, software, and services are designed using roadmaps that anticipate and support constantly changing business requirements.

4.0 CREATING MORE PRODUCTIVE AND FLEXIBLE WORKPLACES USING SCALABLE TOOLS THAT ENABLE IMPROVED COLLABORATION, MOBILITY AND REMOTE CONNECTIVITY

CCRE helps create more productive workplaces. Cisco's converged network for voice, video and data is an enabler for creating a flexible real estate portfolio, and supporting new workplace designs – at the same time improving organisation-wide productivity, collaboration and mobility.

Robust, scalable and secure networks for voice, video and data improve employee productivity. IP communications, wireless access and virtual private networks (VPNs) create flexible work environments, employee mobility and remote working initiatives. A converged network allows secure synchronous and asynchronous collaboration – email, voice mail, conference calls, video conferencing, knowledge management initiatives, intranets and instant messaging. This enables new working practices while reducing overall real estate requirements through, for example, hot desking and VPN-based remote working.

Real estate owners can take advantage of a fully converged intelligent information network to create virtual workspaces that provide more flexible and efficient work environments anywhere on the premise. This converged intelligent information network provides wireless work areas that connect people to important corporate assets and building amenities – to provide greater mobility, productivity and communication capabilities. This allows owners to achieve greater operational gains derived from much more flexible and efficient usage of their existing space.

5.0 ENHANCING HEALTH, SAFETY AND SECURITY FOR A BUILDING'S OCCUPANTS

The convergence of IT networks and buildings systems has a significant impact on the ability to create safer buildings. Interoperability of devices and networks ensures that critical real time data can be acted upon. Video surveillance, access control and asset management over the IP network can be used to drive more sophisticated and comprehensive physical security strategies.

CCRE provides a secure platform for consistent, real-time communication of emergency status and instructions through data, voice and video formats to multiple devices including PCs, IP telephones, or even information display and public address systems. This allows rapid communication of emergency information to tenants, visitors, and employees. For example, IP Telephony applications allow security personnel to rapidly inform building occupants of security breaches that may require building evacuation.

CCRE enables state-of-the-art access control to buildings and car parks using a variety of recognition technologies. This not only allows close control of expensive resources such as car parking but also lets building owners regulate entry to buildings, for example excluding personnel who are listed as on holiday or on sick leave (and may be victims of identity theft).

IP-enabled CCTV has been shown to reduce vandalism and other forms of lawlessness. The flexibility of an IP network enables clear images to be monitored at any distance and instant action to be initiated. Digital storage of IP CCTV enables archived images to be instantly recalled without laboriously searching through videotapes.

6.0 CISCO CONNECTED REAL ESTATE SCENARIOS

The following sections explore the business advantages of several different CCRE environments including:

- Cisco Connected Workplace
- Cisco Connected Commercial Real Estate
- Cisco Connected Hotels
- Cisco Connected Public Spaces
- Cisco Connected Construction

All of these different scenarios share the common characteristics detailed in the following paragraphs.

Capital costs are reduced during construction because a single CCRE cabling infrastructure based on open standards largely replaces the requirement for multiple closed proprietary networks and the associated expense of installing them.

CCRE converges all building systems – including enterprise voice and data networks, HVAC, security and access, energy, lighting, and fire and safety – onto a single Cisco multi-service IP platform (either directly, or through gateway products), driving down capital expenditure and operational costs.

An open standards-based IP building infrastructure encourages a centralised approach to monitoring, maintaining and controlling the building environment. In fact, in the case of multiple properties, CCRE enables the entire property portfolio to be run from a single location, saving huge costs and enabling standardisation of excellence across the group.

CCRE IP infrastructures feature embedded technologies that guarantee quality of service and high levels of security and resilience. This means far less troubleshooting and repair work, further reducing costs. Furthermore, all components of the network are built entirely on open standards. Hardware, software, and services are designed using roadmaps that anticipate and support constantly changing business requirements.

Improved safety and security enabled by the CCRE IP infrastructure – including integrated video surveillance, access control and asset management systems – drives more sophisticated and comprehensive physical security strategies. That interoperability of building devices and networks enables managers to act and make critical decisions in real time.

7.0 CISCO CONNECTED WORKPLACE

The Cisco Connected Workplace solution releases employees from traditional time constraints. It leverages a converged multi-service IP platform that enables ubiquitous connectivity and communications right across the enterprise. The result: empowered people who can work collaboratively whenever and wherever they may be; major increases in productivity and employee satisfaction (and the competitive advantage and bottom line contribution that come with those); and a reduction in both space requirements and capital and operational expenditure.

Specifically, Cisco Connected Workplaces delivers these key business benefits:

- It enables mobile and remote collaborative working between all key stakeholders in the business (employees, partners, suppliers and customers).
- It allows new services (such as IP Telephony and wireless Internet access) to be deployed quickly and easily.
- It frees the organisation to adopt new and innovative workplace designs and to rationalise corporate real estate.
- It saves capital expenditure and operational expenditure through reductions in space requirements and reduced network complexity.
- It provides guaranteed quality of service, high levels of resilience, and lower maintenance costs.

With Cisco Connected Workplace, complete employee mobility is enabled, through wireless access in-building and on-campus together with secure remote access. The ability to work collaboratively and overcome the barriers of time and location – interconnecting employees, partners, suppliers, and customers – enables dispersed teams to work smarter, faster and more efficiently. Furthermore, uniform desktops and IP Telephony ensure that people can start work immediately at any location, and be found instantly wherever they may be.

A Cisco multiservice IP infrastructure has the in-built ability to offer all current advanced technologies – such as wireless, IP Telephony, Content Distribution Networking, Security and Virtual Private Networks (VPNs). But the future-proof nature of open IP standards means that it will also support tomorrow's advanced technologies too. As well as peace of mind and investment protection, it also means that a firm can introduce the technologies at its own pace, in keeping with its own business needs.

The converged multi-service IP platform on which the Cisco Connected Workplace model is constructed reduces the need for 'swing space'. People, peripheral devices – even entire departments – can be spatially reassigned in software, and can start working immediately in their new locations: enjoying precisely the same facilities they had in the area they left. Moreover, Cisco Connected Workplace finally erases the need for a relationship between a person and a particular physical desk, enabling supreme flexibility of accommodation and the possibility of new workplace designs.

The Cisco Connected Workplace solution converges building systems – such as HVAC, security and access, energy, lighting, and fire and safety – and the enterprise network, onto a single Cisco multiservice IP platform, driving down capital expenditure and operational costs.

The organisation can work more safely as well. Improved safety and security through integrated video surveillance, access control and asset management enabled by the Cisco Connected Workplace IP infrastructure drives much more sophisticated and comprehensive physical security strategies. That interoperability of building devices and networks enables managers to act and make critical decisions in real time.

CASE STUDY: CISCO SYSTEMS EMEA REGION

Challenge

The Cisco EMEA (Europe, Middle East and Africa) regional operation employs over 7500 people and has an extensive real estate portfolio consisting of 96 sites. Cisco EMEA was looking for a technology solution that would help maximise real estate returns by supporting new flexible working methods across EMEA.

Solution

Cisco EMEA implemented Cisco's own industry-leading AVVID architecture to create an IP networked building solution across its entire real estate portfolio, to provide employees with anywhere and anytime connectivity to voice, video and data.

Any IP-enabled device – including Cisco IP Phones, desktop PCs and laptops – can now be plugged into any access point, allowing voice, video and data to be accessed and shared by anyone, anywhere on the network. Wireless IP is providing additional flexibility, as an overlay to the wired IP infrastructure. With wireless connectivity, staff working anywhere on-site can be on the intranet within seconds. Cisco is also offering wireless hotspots in reception for visitors to use.

The new infrastructure has also transformed real estate security and allows Cisco security personnel to monitor Cisco EMEA facilities using a networked building security system. This solution allows Cisco EMEA to monitor its own real estate portfolio, detect problems and respond to incidents. An event, such as breach of a side door at any Cisco sites in the region, triggers the system to send real-time information of the event to a central security hub near Heathrow Airport, colour coded according to priority. Security personnel can then immediately view live video footage, streamed from the camera located on that entry point, to verify the cause of the breach.

Results

With its IP solution, Cisco EMEA can now configure its real estate to match user needs. Cisco EMEA has already achieved cost avoidance and cost saving benefits valued at some \$330 million. These include space consolidation, increase in employee efficiency and productivity, improvement in real estate management systems, and reduced cabling, furniture, system maintenance and site-to-site call costs.

Historically cyclical, all real estate market conditions put owners and operators of commercial buildings such as offices, hotels and shopping malls under pressure. In good years, they focus on maximising profits by attracting and retaining the best tenants and guests. In lean years, vacancies rise and achievable rents and room rates are depressed, putting pressure on costs and operational efficiencies.

When either of these cyclical extremes occurs, owners and operators who can offer unique and valuable services will differentiate their buildings, enhance their values, and optimise accommodation take up. In pursuit of that ideal, Cisco Connected Commercial Real Estate harnesses the power of IP to turn traditional building construction and management paradigms on their heads.

By adopting Cisco Connected Commercial Real Estate solutions building owners can not only offer new services but also reduce capital and operational expenditure – placing them in the best position at any phase of the economic cycle. For example, in lean times the revenue derived from new services can subsidise more competitive pricing – increasing attraction and retention rates.

A Converged Multiservice IP Platform

The Cisco Connected Commercial Real Estate solution enables building owners to take advantage of a continuously expanding suite of innovative tenant services and building management applications. At the same time, greater asset control and new service-based financial models offer protection from changes in the real estate market.

Cisco Connected Commercial Real Estate leverages a converged multi-service IP platform that allows the property owner to offer voice, data and video services as part of the rental package as well as supporting intercommunication between building systems such as HVAC, security and access, energy, lighting, and fire and safety.

The result: differentiated properties with increased values through new revenue streams, combined with reduced building lifecycle costs and more efficient building management – together offering a sustainable new business model for office building ownership.

Specifically, Cisco Connected Commercial Real Estate delivers these key business benefits:

- It allows the creation of new tenant services (from wireless Internet access and IP Telephony to unified messaging and video) generating new revenue streams with guaranteed quality of service and high levels of security and resilience.
- It enables easy implementation of innovative building amenities and applications – such as virtual concierge, soft signage and online room booking – increasing tenant attraction and retention rates.
- It provides tenants with solid outcomes such as reduced cost and complexity in the move to new premises, reduced operational expenditure on network upkeep and upgrade, and access to productivity tools without capital outlay.
- It offers investment protection from the cyclical nature of the real estate industry through the ability to enhance property values and create differentiated buildings.
- It reduces capital expenditure and operational expenditure over the building lifecycle, and provides greater control over the management of building systems and facilities.

Traditionally, tenants are simply provided with heating, lighting, ventilation and other 'standard' building services. When it comes to network services, they are expected to purchase direct from a service provider. Not only do they pay market rates for relatively basic services but also they are expected to manage the installation and implementation themselves.

By investing in the converged high-speed IP infrastructure provided by the Cisco Connected Commercial Real Estate solution, property owners can securely and seamlessly deliver network services to their tenants at a fraction of the cost that they would pay to acquire such services on their own. And instead of waiting weeks or months for those services, tenants get them within hours.

Other revenue streams can be generated by the provision of premium, high-functionality office amenities for tenants. Building owners could, perhaps, use the IP backbone to support digital advertising and streamed media content, or deploy interactive media systems such as building directories and booking systems.

For incoming tenants the supreme benefit is immediate start-up in the new location, with ongoing flexibility of space and organisation. What is more, the Cisco IP infrastructure provides a strategic foundation that evolves with their needs and is virtually unlimited in its functionality and scalability.

Capital costs are reduced during construction because with Cisco Connected Commercial Real Estate a single cabling infrastructure based on open standards largely replaces the requirement for multiple closed proprietary networks and the associated expense of installing them.

Operating costs are also reduced. An open standards-based IP building infrastructure encourages a centralised approach to monitoring, maintaining and controlling the building environment. In fact, in the case of multiple properties, the Cisco Connected Commercial Real Estate solution enables the entire property portfolio to be run from a single location, saving huge costs and enabling standardisation of excellence across the group. Cisco converged IP infrastructures feature embedded technologies that guarantee quality of service and high levels of security and resilience – reducing maintenance and repair costs.

Cisco Connected Commercial Real Estate also enjoys improved safety and security: integrated video surveillance, access control and asset management enabled by the IP infrastructure drives much more sophisticated and comprehensive physical security strategies. That interoperability of building devices and networks enables managers to act and make critical decisions in real time.

CASE STUDY: SENTRE PARTNERS, SAN DIEGO

Challenge

San Diego-based SENTRE Partners employs just 35 people and manages, leases or owns assets in excess of \$500 million and totalling some 3.5 million square feet. But it is a real estate company with a difference: its owners believe that, when their tenants move into a new office, plugging computers into a network should be as easy as plugging desk lamps or coffeemakers into electrical outlets.

Solution

In February 2003, SENTRE Partners started working with Cisco Systems to plan an optical building infrastructure and wireless network for San Diego's One America Plaza. In May 2003, One America Plaza was announced as the first fully wireless-enabled building in the United States. Now SENTRE Partners has six such next-generation buildings and is planning a lot more. A critical aspect of SENTRE's next-generation buildings is that the network infrastructure is paid for and owned by the building owner, not the tenant. The network also offers a variety of building management facilities that help SENTRE better serve its tenants while driving down cost. Its properties use a Web-based work order system utilising the wireless infrastructure. Building engineers carry tablet PCs, and open and close tenants work orders on the spot.

Results

SENTRE tenants receive high-speed wired and wireless connectivity when they plug into the building's optical network for just \$250 per month, compared to an average cost of \$1,000 per month if they were to install their own lines. What is more, the connection can be up to 60 times faster than a typical leased line. In some cases, tenants are saving up to \$3,000 per month. There are no contracts and no hassle and the network is managed 24 hours a day. Tenants are connected in 30 minutes rather than the 30 days they may have experienced before. One America Plaza enjoys occupancy rates of 95 per cent, compared to typical local occupancy rates of 88 per cent. It is a safer and more secure building too. For example, tenants can access the building management system to get hazardous situations fixed quickly, and a security guard can click a button and find out exactly who is authorised to enter the building after hours.

9.0 CISCO CONNECTED HOTELS

The Cisco Connected Hotels solution transforms hotels into highly responsive, full-service environments. It leverages a converged multi-service IP platform to enable hotels to deliver and support a suite of highly differentiated and innovative guest services and staff resources. It also allows greater control over the management of hotel operations, as well as enhanced building amenities.

The result: competitive advantage built on enhanced levels of customer satisfaction; new revenue streams; and a reduction in both capital and operational expenditure over the lifecycle of the hotel.

Specifically, Cisco Connected Hotels delivers these key business benefits:

- It enables the delivery of an expanding portfolio of premium and personalised guest services that increase customer satisfaction, support brand differentiation and help create new revenue streams
- It improves staff productivity, and increased their responsiveness to the needs of guests, enhancing the guest experience
- It allows greater control over the management of hotel operations together with enhanced building amenities and greater guest safety and comfort.

With Cisco Connected Hotels an integrated suite of data, voice, video, mobility and security solutions – ranging from high-speed wireless Internet access to IP Telephony and ‘find me’ functionality – allows the automation (or even elimination) of time and resource-consuming tasks. For example, confirming flights, making dinner reservations and checking in and out of the hotel become fast and effortless.

The provision of premium services for guests – interactive in-room entertainment systems, for example – can create entirely new revenue streams for hotels. And the profits from those new services (together with savings from streamlined business processes) can be passed on in the form of more competitive room pricing, ultimately increasing attraction and retention rates.

In Cisco Connected Hotels the use of collaborative technology enables hotel staff to be more productive and more responsive to the needs of guests, strengthening customer loyalty. Integrated applications linking systems such as reservations and billing with guest touch points such as kerbside greeters, baggage handling, check in, concierge, dining and business management provide a seamless and differentiated customer experience.

The ability to manage hotel and building services and amenities – from staff scheduling and availability to video surveillance and energy monitoring and forecasting – reduces costs and contributes to customer comfort. For multiple buildings the control can be exercised from a single access point, leading to further savings in administration and maintenance.

Cisco Connected Hotels also brings improved safety and security. Integrated video surveillance, access control and asset management enabled by the IP infrastructure drives much more sophisticated and comprehensive physical security strategies. The interoperability of building devices and networks enables hotel management to act and make critical decisions in real time.

CASE STUDY: THE CROWN PLAZA HOTEL, DUBLIN

Challenge

Situated in 10 acres of tranquil parkland just outside Dublin Airport, the 204-room Crowne Plaza offers everything from a club floor and lounge to international cuisine and a high-tech gym. The hotel needed to create differentiation from its competitors through increased quality and value. At the same time, it needed to create sustainable revenue from new services, reduce costs and improve internal processes.

Solution

Cisco Systems provided the Crowne Plaza Dublin with a range of services, including: high-speed Internet access in every guest room and easy-to-use IP Phones that enable guests to send and receive email, look up information on hotel services, check the weather and even book taxis. The IP Phones are also personalised by language with specific greeting messages, and even individual company logos. Further benefits enable, for example, a maid to restock the minibar or order fresh towels from a room using the same intelligent IP Phone.

A business centre comprising 14 meeting and conference rooms is connected via a wireless network that enables delegates and guests to move freely with access to high-speed Internet access anywhere within the conferencing area (no cables or leads required). High-speed Internet access using Wi-Fi hot spots throughout the lobby, bar and other common areas of the hotel enables guests to work at their convenience in a relaxed environment.

Results

Based on the projected increase in profitable occupancy the hotel expects its network to have paid for itself within three years. This figure could be even shorter (and that is without the consideration of attracting new guests through its new services). Additional revenue opportunities are now emerging. A local car hire company wants to advertise through the guest IP Phones, and other local leisure attractions are expected to follow suit.

Our definition of public spaces includes mass-user facilities such as convention centres, stadiums, shopping malls, transport terminals and airports. The operators of such areas not only need to become more service-centric in order to differentiate their buildings but they also have a responsibility to improve their visitors' safety and security.

The commercial imperative is to increase building occupancy, create new sources of revenue and attract the most desirable tenants and visitors while driving down costs. In achieving these goals, operators face the challenges of building stronger, trusted relationships with tenants and visitors and responding to cyclical changes triggered by global events affecting spending on business events, travel and leisure.

The Cisco Connected Public Spaces solution addresses those objectives by creating a highly empowered environment. A powerful and intelligent multi-service IP network automatically and securely connects operators, tenants and visitors to innovative amenities, applications, building features and virtual workspaces. With a Cisco Connected Public Spaces IP infrastructure in place, the use of leading edge technologies becomes possible, enabling people to safely and securely maximise their business or leisure experiences.

Spectating at a sporting event, attending a seminar, visiting a shopping mall or catching an airplane, people will be able to take advantage of innovative services including on line directories, self check-in kiosks and electronic messaging boards providing up-to-the-minute information on locations, timetables and services.

At a stadium, people can use handheld devices to check scores and statistics, access player information and even order lunch or snacks – all without leaving their seats. In a shopping mall images of lost children, captured as they entered the facility, can be flashed to all retail units. At a station, informed staff will be able to use mobile terminals to offer assistance and information to passengers. In a convention centre, interactive video will inform and guide delegates. The possibilities are endless.

Powerful IP networks will enable new services to be offered to tenants and visitors. High-speed Internet access, integrated network and physical security, and innovative video marketing tools – as well as an expanding suite of web-based property and event management applications – will automate, virtualise and streamline time and resource consuming operations.

Emergency crews can also benefit from virtual workspaces – providing them with high-speed Internet access via wireless or mobile networks – in order to reach important networked resources from designated locations.

CASE STUDY: BULLRING, BIRMINGHAM

Challenge

The Bullring retail centre in Birmingham is one of Europe's largest city centre retail regeneration schemes. Serving a catchment population of 4.3 million with an estimated annual potential spending power of £4.1 billion, Bullring offers a massive 26 acres of prime retail space.

Bullring developer, The Birmingham Alliance, was looking to support its vision of an exciting 21st century retail, food and entertainment environment by offering retail tenants and their customers the very latest in world-class communications facilities.

Solution

The Birmingham Alliance chose Cisco technology to create a highly innovative state of the art end-to-end IP Bullring network for voice, video and data. Designed, implemented and managed by 'Smart B' intelligent building supplier, Redstone Communications, the new Bullring IP network uses Cisco's AVVID architecture, safeguarded by Cisco security technology and offering secure wireless mobile connectivity.

Able to deliver 100Mbps to all 132 retailers, the Cisco-based IP network also supports the 30-strong Bullring management team with IP Telephony and a range of other network services, and offers more than 50 public points of presence. With a thin client Web terminal installed in every retail unit, the converged network offers retail tenants broadband Internet/intranet connectivity as standard, as well as immediate access to a wide range of additional 21st century IP facilities and services.

A wide variety of optional IP-enabled communications services is on offer to tenants, including IP Telephony, wireless Internet connectivity, voice-activated connectivity, local data back up, VPN links to a corporate network and closed-circuit TV. To provide additional feature-rich services, a comprehensive Cisco wireless network has been installed to cover the entire Bullring complex, thereby creating a massive wireless broadband lake. With the Cisco-based wireless network in place, Bullring customers can access the Internet anywhere in the retail centre, through a laptop, PDA or other device, simply by purchasing an access card.

Advertising and sales promotion will also be accomplished electronically. The IP network can be used to reach a captive audience of thousands of shoppers every day, by posting multimedia advertising, sales promotions, job vacancies and other information on the numerous interactive touch screens and passive plasma screens situated in the malls.

Results

The Cisco IP network offers Bullring tenants and customers a level of connectivity and interactivity they have never had before in a retail environment. It supports tenants in realising increased efficiency and profitability, and it helps ensure the most exciting retail experience for customers.

In the intensely competitive construction industry, successful companies are constantly looking for ways to improve their margins and meet tighter deadlines. Client demands for high quality, on time, low budget projects are the only constant, forcing contractors and sub-contractors to relentlessly search for the best materials and resources at the lowest cost. It is difficult – but not impossible – for construction companies to differentiate themselves beyond price.

There are many areas in which technology-based best practice can help. For example, working from outdated documents adds time and costs to construction projects. The inability to collaborate in real time with architects, owners, and subcontractors can cause costly miscommunications and delays. Supervisors waste valuable time travelling to meetings or getting delayed with paperwork in the construction trailers. Poor security at a construction site makes companies vulnerable to theft and vandalism. Inadequate documentation tracking can expose companies to litigation or penalties. The inability to promptly disseminate new regulations or Health & Safety information to work crews can result in injuries and violations.

In addressing such concerns, Cisco Connected Construction enables construction companies to take a major leap forward using technology at the job site. Cisco Connected Construction solutions can help to create a construction environment with the following characteristics:

A responsive worksite – Today, if job site personnel need to track down people or information, they often have to interrupt their schedule and spend time searching. A secure, high-performance wireless network enables real-time access to the people and information that managers need, no matter where they are located. Managers can use design, data collection, project management, and inspection applications on their wireless notebooks and PDAs to securely access information and communicate ideas in real time. Wireless IP phones allow them to be contacted anywhere on the job site. And with secure VPNs, they can save travel time by accessing the corporate network from the field.

A collaborative worksite – An intelligent IP network that supports voice, data, and video makes it possible to extend voicemail and audio conferencing to job sites without installing a PBX or key system. This IP network can also support videoconferencing.

A connected worksite – High-speed, secure connectivity to the Internet expedites access to information, such as requests for information (RFIs), requests for proposals (RFPs), and work change directives (WCDs), helping to ensure that everyone is working from the right document version, and also providing a digital paper trail for audit purposes. The same IP network can support video on demand, enabling companies to offer job skills and Health & Safety videos to work crews on staggered schedules – saving on travel time and expenses.

A streamlined worksite – Using XML (Extensible Markup Language) applications such as time-card functions on PDAs and laptops, supervisors can spend more time outside the construction trailer, supervising crews and collaborating with partners. They can input information in real time and reduce errors associated with re-keying paper-based reports.

A protected worksite – Network and physical security are equally important at the job site. Layered security built into the network enables companies to take advantage of collaboration and information sharing, while safeguarding proprietary data from unauthorised access. Networked surveillance cameras extend security coverage to less accessible areas of the job site, to protect against theft and vandalism. Webcams enable companies to update architects, contractors, and building owners on the status of the project. The same IP network can be used to support badge reader and radio frequency identification (RFID) tag applications.

Cisco Connected Construction Business Benefits

The Cisco Connected Construction solution provides construction companies with the opportunity to increase work crew productivity, improve project management, and reduce costs. It consists of an intelligent information network that transforms a construction site into a highly productive environment. It provides the entire project team – including the prime contractor, architects, designers, sub-contractors and suppliers – with ubiquitous network connectivity and communications throughout the site to fuel the exchange of real time information.

Specifically, the Cisco Connected Construction solution helps companies to:

- Avoid costly downtime, reworks, and duplication of effort by giving people access to the most current documents and resources they need to do their jobs quickly and efficiently.
- Enable real-time collaboration with outside partners, and position themselves as more efficient, technology-enabled partners to their own customers.
- Reduce the inefficiencies and high costs associated with traditional telephony systems, including cellular phones, using IP telephony solutions.
- Extend business applications beyond the trailer, enabling staff to work more productively throughout the day, and improve document control for audit.
- Improve worker safety and worksite security, and reduce losses and downtime due to theft and vandalism.
- Give headquarters staff and customers visibility into site progress, and minimise unnecessary travel time and costs.
- Establish a network foundation that will support new business initiatives in the future, use their networks to manage entire portfolios of job sites from headquarters, and implement an easily repeatable model that can be extended to other job sites.

By enabling construction companies to achieve profitable and sustainable business models, Cisco Connected Construction provides timely and accurate visibility of information spanning entire projects. In a Cisco Connected Construction future, construction companies will use the same powerful network to centrally manage all of their projects and sites – and streamline construction processes – to improve productivity and reduce costs across the board.

12.0 CISCO CONNECTED REAL ESTATE TECHNOLOGY OVERVIEW

Through the convergence of IT and building automation networks, CCRE creates a single IP infrastructure over which building systems can be connected and innovative tenant services can be offered. Using Cisco's framework for voice, video and integrated data (AVVID) the converged nature of a CCRE IP environment enables several different (and hitherto separate) areas of technology to be brought into play to realise the CCRE advantages described in this white paper. The most important current technological areas are discussed in the following paragraphs, but new applications are being added virtually every day.

12.1 DATA TECHNOLOGY

Metro Ethernet And Optical Networks

First generation broadband services, such as digital subscriber line (DSL), are not ideal for the latest data and content-rich applications. In contrast, Metro Ethernet is a proven and highly scalable technology that can provide business tenants with massive Gigabits-per-second bandwidths.

By equipping their properties with optical network-based Metro Ethernet services, building owners can quickly provide tenants with ready-to-go, high-speed Internet access. In turn, this allows tenants to avoid time consuming and expensive cabling. Building owners can offer this advanced connectivity as a paid-for service, thereby generating a new revenue stream.

Wireless Data

Building owners are starting to offer 802.11 wireless (Wi-Fi) access to tenants and building visitors by installing wireless hotspots throughout their properties. In some cases, Wi-Fi connectivity is offered to tenants as a paid-for service in a utility model that serves to drive incremental revenues. In other cases, it is offered as an amenity designed to attract new tenants and minimise vacancy rates.

12.2 VOICE TECHNOLOGY

IP Telephony Services

By replacing traditional Private Branch Exchange (PBX) systems with IP Telephony, building owners can offer their tenants a range of advanced Cisco IP Phone-based services including:

- High quality voice communications and unified messaging services.
- Phone-delivered email and phone-based videoconferencing.
- Integration with corporate business and productivity applications.
- Integration with emergency communication systems enabling live or recorded voice or text messages to be broadcast directly to phones.
- Integration with property management systems so that phone-based requests for concierge and maintenance services can be automated.

Building owners will benefit because they can attract new tenants and derive new revenues from leasing voice services to tenants. Tenants can cost effectively obtain advanced voice services and powerful phone-based applications, avoiding initial capital expenditure.

12.3 VIDEO TECHNOLOGY

Business Services

Using a Cisco AVVID infrastructure, building owners can offer business tenants network-based video applications including:

- Videoconferencing.
- Live IP TV broadcasts and video-on-demand.
- Distance learning and e-learning.

Next-Generation Video Entertainment

By deploying a Cisco AVVID infrastructure throughout multi-tenanted units, property owners can offer residential tenants advanced video services over a common communications platform including:

- Internet and email access via interactive TV.
- Video-on-demand, with a wide range of titles and flexible start times.
- Local information services.

12.4 BUILDING SYSTEMS TECHNOLOGY

Video Surveillance

A converged network allows building owners to deploy IP-based video surveillance services at a fraction of the cost of analogue closed-circuit television (CCTV) systems. Digital video surveillance offers significant advantages compared to analogue CCTV, including:

- Superior video quality and video portability compared to older technologies, together with instant retrieval of security information
- The ability to leverage network-based digital storage, eliminating the need for VHS tapes and their management
- More efficient and effective supervision of multiple properties via a centralised security operations model
- Intelligent use of individual cameras to monitor areas of interest or for tenant services, such as virtual escorts to underground parking facilities.

From an occupant perspective, IP video surveillance can be offered as another service without major change to the network infrastructure. Tenants can even have their own video surveillance systems that they can access from anywhere on the Internet, creating peace of mind and greater real security.

12.5 SAFETY AND SECURITY TECHNOLOGY

Access Control

Integrating access control devices into building networks enables security personnel to control entry, track visitors and detect intrusions into entryways, car parks, elevators, hallways and offices more quickly. The devices can range from building card systems to biometrics.

Fire Alarms And Safety Alerts

A main concern for both building owners and occupants, IP-based building networks can be used to support a range of safety functionality providing unified, real time, security information. This allows enhanced monitoring of properties and improved co-ordination with emergency services.

IP network enabled fire alarms and safety alerts reduce emergency services' response time in the event of fire, terrorist threat or other emergency. Networked security systems can – for example – automatically release emergency exit locks, broadcast pre-recorded status messages, display exit paths on bright plasma screens, and enable ventilation systems for smoke extraction.

However, it is important to note that some European countries have legislation in place that prevents fire alarm systems from sharing a common infrastructure with other building systems. In addition, phones in lifts and emergency lighting may be required to have hardwired connections.

12.6 BUILDING AUTOMATION TECHNOLOGY

HVAC

Automated and networked HVAC systems can efficiently control a building's temperature, humidity and airflow. This allows tenants to adjust the environment in their individual spaces, thus conserving energy and controlling costs. In addition, furnaces, chillers and even compressors can be equipped with sensors that continually monitor the equipment for an indication that preventative maintenance is needed.

Lighting Control

Lighting systems today can be accessed and computer-controlled by the building owner or by the tenant via web-based control systems. Lights can be dimmed and turned on or off depending on whether or not the room is occupied. Lighting systems can now be linked to a centralised information system that shows point-in-time usage or usage patterns for either a single building or an entire portfolio.

Elevator Control

By network-enabling elevator systems, their operations can be monitored and optimised. Access control cards allow tenants programmable, selective access to certain floors. Interactive in-elevator terminals can stream content, ranging from news feeds to emergency instructions. In addition, elevators can be continually monitored for performance and breakdowns to drive proactive maintenance.

Energy Management

Large buildings and complexes consume large amounts of energy, and both building owners and tenants want to minimise energy wastage and utility bills. Energy management systems such as thermostats, environmental control systems, lighting, machinery and onsite generators can be network enabled. This allows building owners and tenants to limit electricity and gas usage to the times when they are needed and reduces total energy costs.

Parking Control

Entry to parking areas can be controlled via access cards or other electronic identification methods. In addition to access control, parking systems can integrate with security, lighting, elevator and HVAC systems. These systems can be programmed to turn on and off for the individual tenant when they enter the parking structure. Visitors' parking costs can be monitored and accounted for electronically, reducing administrative overheads.

Digital Signage

By using computer controlled plasma or LCD screens, building owners can integrate digital signage with their building automation systems to drive real time control of premises messaging content. When leases become digital, tenant directories can be immediately updated when the tenant puts their digital signature on the lease and clicks the OK button. Building visitors can videoconference with tenants from the lobby, and digital concierge services will enable tenants to order business services, supplies, works orders and consumables.

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