

SigmaUptime

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SMARTER CITIES



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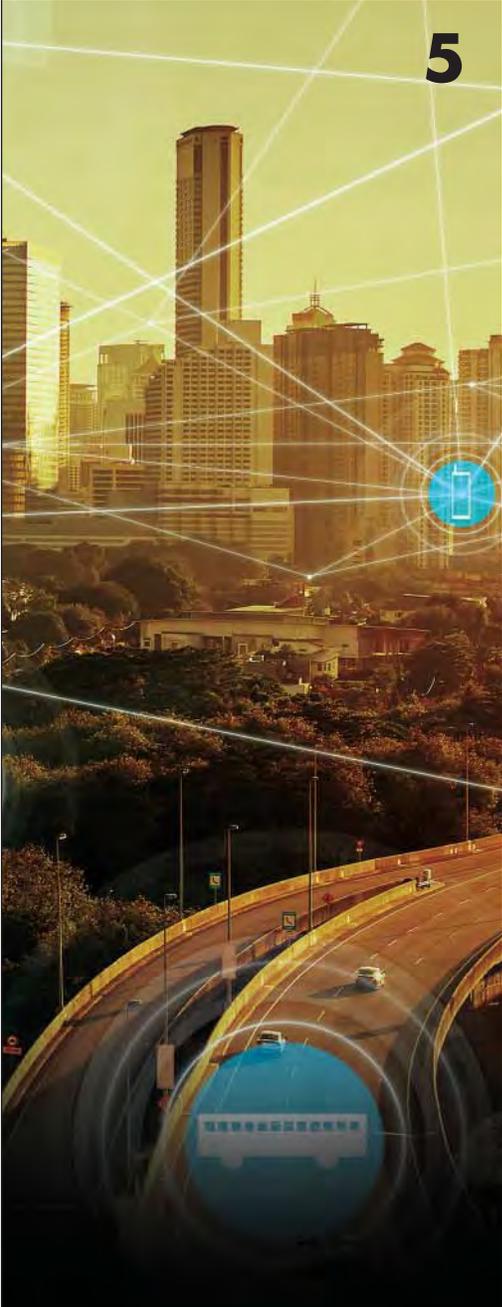
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Smarter Cities

Hitachi helps cities respond to massive growth with advanced digital infrastructures.

The growth of large, urban centers is a fairly recent phenomenon. As recently as 200 years ago, 97 percent of the world's population lived in rural areas and depended on agriculture and hunting for survival. However, the Industrial Revolution swung the focus of economic activity to cities in the early 1800s, and there's been massive and steady population shift ever since.

The World Health Organization says the world's urban population will nearly double over the next few decades, with about 70 percent of all people living in cities by 2050. By some accounts, a good chunk of these folks will be living in "megacities" — metropolitan areas of excess of 10 million people.

Such growth puts enormous strain on infrastructure and resources. The U.S. Conference of Mayors noted recently that increasing population densities cause traffic congestion, which in turn increases air pollution and health risks. There are corresponding rises in crime rates and other public safety issues as well.

Data-Driven Insights

To address the demands of urban growth, more and more cities are investing in "smart city" projects to improve the efficiency of essential services and functions. These projects involve widespread deployment of Internet of Things (IoT) technology to aggregate data from various sensors, solutions and applications, conduct advanced data analytics, and then use that information to improve efficiency and resource utilization.

According to the mayors' conference, momentum is building all over the country. In January, the group released results from a survey of 54 cities, revealing that 335 smart city projects are currently being implemented and 459 are being

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planned through the end of the year. Of those currently being implemented, 69 are taking place in large cities, 168 in mid-size cities and 98 in small cities.

“Cities are poised to be the centers of technological deployment,” said Fred Ellermeier, Vice President and Managing Director of Black & Veatch, a global engineering, construction and operations company. “Many are already driving advancements in intelligent transportation systems and initiatives. They are rapidly moving past pilot phases to use advanced data networks to improve resident experiences across municipal departments and services.”

These projects are transforming the movement of people and goods, while smart street systems create opportunities to generate value from existing municipal assets. Many projects involve modernizing the utility grid infrastructure. Taken together, smart city projects are changing how first responders, government officials, public agencies and transportation fleets operate.

Smarter and Safer

Public safety is a strong component of smart city initiatives. Population growth puts a particular strain on police, fire and emergency responders. Data-driven insights can en-

sure optimal resource utilization, improved awareness and stronger cooperation among public safety organizations.

Hitachi Data Systems has become particularly adept in this niche smart city technology. Through a string of recent acquisitions and tighter integration with some of its sister companies, the long-time data storage powerhouse has created a broad portfolio of public safety solutions that combine IoT, big data analytics and IT infrastructure technologies.

With Hitachi’s Visualization solutions, cities can apply predictive and prescriptive analytics to captured video and IoT data. This two-part solution consists of Hitachi Visualization Platform (HVP) intelligent edge-capture devices and Hitachi Visualization Suite (HVS), an integrated cloud and mobile software platform.

HVP video-capture and gateway devices allow cities to intelligently collect, share and analyze information with built-in wireless networked data and video feeds. These devices are also seamlessly integrated with private video feeds and are widely used in public safety systems, such as license plate recognition, gunshot detection and computer-aided dispatch technologies.

HVS aggregates this data into a common, live operating picture, providing full situational awareness to support incident management and investigations. Critical information is presented intuitively by placing an integrated view of multiple video feeds, sensor data and information from third-party public safety systems onto a map of the area.

HVS analytics software also taps into information from public sources such as social media and online news, using algorithms to search for correlations and anomalies. HVS workflow software then allows organizations to use this insight to rapidly and remotely respond by, for example, repositioning cameras, sending customized alerts to appropriate personnel and storing data for evidence.

Improving Visibility

Austin, Texas, uses Hitachi Visualization to support its police department through the real-time collection, analysis and sharing of data from sensors and cameras around the city. The High Activity Location Observation (HALO) project was designed to create data-driven policing decisions that would help detect and deter crime.

Video recorders mounted throughout the city have integrated communication devices with built-in 4G LTE, Wi-Fi and GPS. These devices feature acoustic and optical sensors to detect gunfire, high-definition cameras for identifying license plates in any conditions and integrated dispatch capabilities for automatically initiating emergency calls. They can even detect radioactive isotopes in the event of an attack or accident involving radioactive materials.

“We’ve been able to reengineer our department into a data-driven and intel-based policing organization,” said Troy Gay, assistant police chief. “The public safety camera project





HEAD OF THE CLASS

Singapore tops the list of the smartest cities in the world, according to the most recent rankings from Juniper Research. Barcelona, London, San Francisco and Oslo round out the top five.

The research firm ranked cities on a number of characteristics, including their adoption of smart grid technologies, intelligent lighting, the use of information technology to improve traffic, Wi-Fi access points and smartphone penetration. Juniper Research gave Singapore high marks for its smart mobility policies and technology as well as its wireless connectivity.

Here's a brief look at the top five.

SINGAPORE. As part of its "Smart Nation" initiative, the city is deploying sensors and cameras across the island city-state that will allow the government to monitor everything from the cleanliness of public spaces to the density of crowds and the precise movement of every locally registered vehicle. Among many other projects currently in place is one in which

individual apartment buildings are measure for energy draw, waste production and water usage in real time. Residents get feedback on their behavior, helping them to use less water, electricity and so on, driving down household costs.

BARCELONA. The capital of Spain's Catalonia region has been among the most eager adopters of smart city technology. The city has installed 19,500 smart meters that monitor and optimize energy consumption. Households deposit waste in municipal smart bins that monitor waste levels and optimize collection routes. The city also invests heavily in bus and parking systems while advancing the use of electric cars and bike sharing. Additionally, sensors guide drivers to open parking spaces, reducing traffic congestion and emissions.

LONDON. In the city's smart traffic system, traffic lights give preferences to buses to ease congestion and encourage use of public transportation. A citywide network of Internet of Things (IoT) sensors

was rolled out in 2016, with embedded sensors that collect and analyze data about pedestrian footfall and movement, traffic congestion, air quality and more.

SAN FRANCISCO. The city was one of the first to implement a smart parking system to ease traffic congestion. Sensors in the street can be used to determine if a parking spot is empty, and anyone who accesses an app on a smartphone can find out in real time the location of the closest parking spot. The city has also launched an IoT-powered sewage monitoring and management system.

OSLO. Like other smart cities, Oslo has installed sensors to help it monitor parking and has launched a broad sensing network for monitoring traffic levels. The city has also installed a sensor network to help improve the care of sick, elderly patients. A network of smart street lighting has reduced energy consumption by nearly two-thirds, and Oslo has started rolling out smart LED lighting.

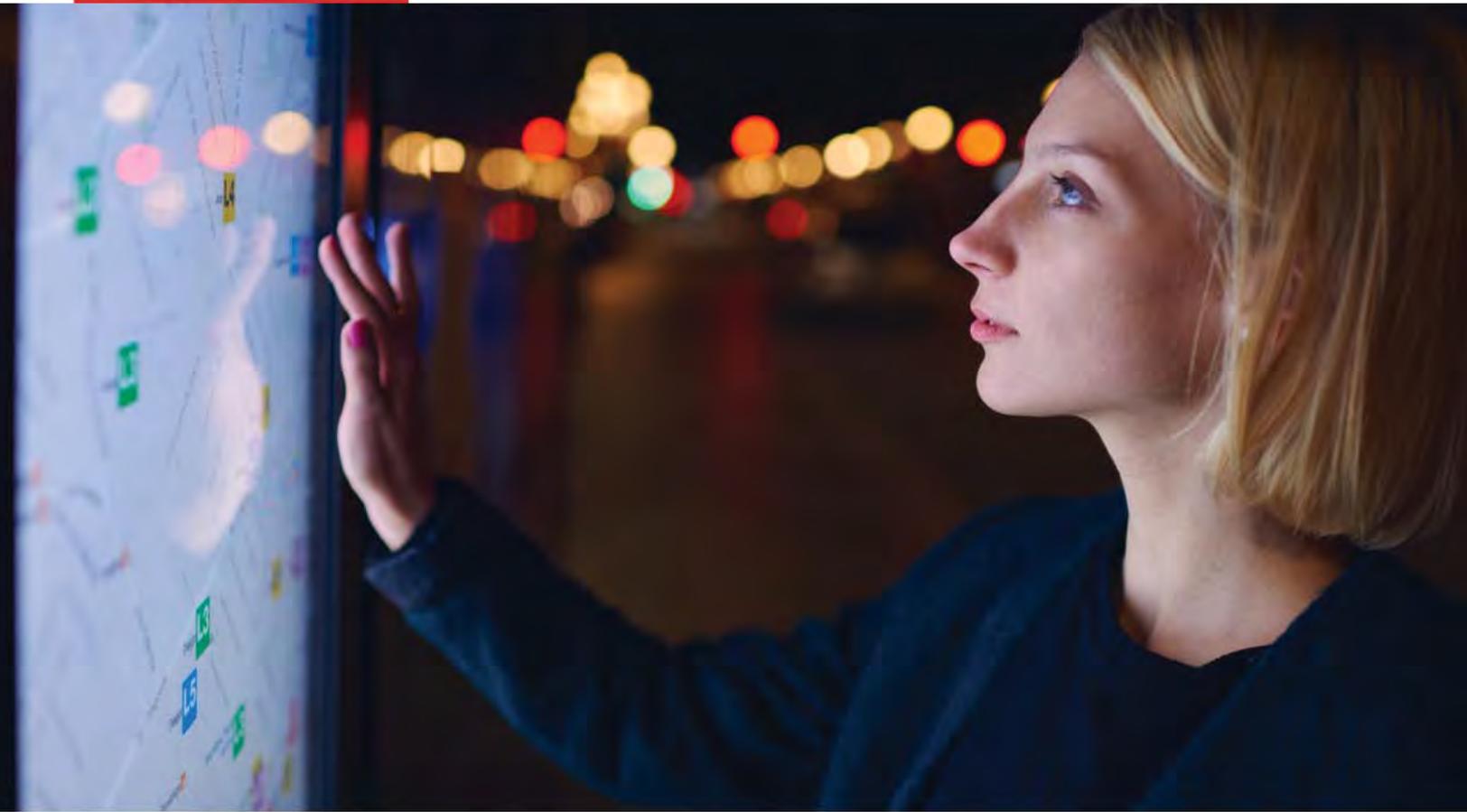
is designed to aid the city in deterring, detecting and investigating crimes."

New York Waterway, which operates ferry services in the Port of New York and New Jersey, uses Hitachi Visualization to monitor and communicate with its vessels at dock and on the water. That's a big job considering the company provides passage for millions of customers traveling by ferry between Manhattan, Brooklyn, Queens, New Jersey, and up and down the Hudson River.

Fleet communication was becoming a problem for NY Waterway due to aging infrastructure. Further, harsh weather and inconsistent cellular and network connectivity contributed to system unreliability. Hitachi Visualization serves as the core management platform for a new system that improves network connectivity and stability, and dramatically increas-

es operational efficiency by providing consistent real-time and remote visibility across the fleet.

"Safe, intelligent public transportation systems are a foundational element of smart cities," said Ruthbea Yesner Clarke, director of global smart cities research at analyst firm IDC. "Public and private entities looking to benefit from the application of smart technologies ultimately require multi-faceted solutions that can address multiple use cases. The Hitachi Visualization solution holistically addresses both public safety and operational efficiency use cases for transportation agencies, as well as law enforcement, governments, municipalities and private companies. This capability uniquely positions it for a broad range of applications in the context of a smart city."



Hitachi Visualization Suite

Your single pane of glass for the Smart City

To effectively manage large amounts of critical assets and incidents, your systems must be integrated so that they can provide meaningful information. The primary goal of Hitachi Visualization Suite (HVS) is to provide a platform for representing just about any real-world object such as a building, car, camera, train, boat — you name it. By integrating critical video and event sources together with fixed and moving assets such as listed above, HVS provides visual and geospatial correlation in a simple interface that takes command and control to a new level.

Contact your Sigma representative to learn more about Hitachi's Smart City solutions portfolio.



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Rethinking WLAN Design

Old principles don't match today's wireless network demands.

Until recently, Wi-Fi has been deployed with an eye toward coverage of a physical space. Coverage-oriented design focuses on the placement of access points (APs) to provide adequate signal strength and ensure there are no dead spots in the area. The approach was meant to provide service to limited numbers of wireless users, using a limited number of devices and requiring limited bandwidth.

Those limits have vanished.

The proliferation of smarter, more portable devices combined with advanced mobile application platforms have fundamentally altered the requirements for WLAN design. Organizations need to support more wireless users, devices and traffic than ever before — and they must be prepared for continued growth for the foreseeable future. Industry analysts anticipate that wireless data traffic will soon surpass that moving over wired networks.

“Recognizing the critical role that WLAN plays in IT’s mobility and digital initiatives, enterprises are committing to WLAN upgrades and refreshes,” said Nolan Greene, senior research analyst, Network Infrastructure at IDC. “Even as global economic indicators are mixed, IDC believes that enterprises will continue to invest in robust WLAN infrastructure in order to compete effectively in the digital economy.”

More Can Be Less

As wireless demands continue to increase, the focus of Wi-Fi network design is shifting from coverage to capacity. In other words, simply providing basic coverage in a defined service area is no longer sufficient. Organizations need to ensure that the Wi-Fi network supports the current and future capacity and performance levels required of an increasingly mobile workforce.

It might seem like a simple matter of adding more APs — after all, the closer a wireless client is to an AP, the better the data rate. It stands to reason that more APs will increase the raw capacity of the WLAN by closing the distance between clients and APs.

However, it isn’t that simple. Too many APs will actually degrade WLAN performance by creating oversaturation. Wireless clients can become confused trying to access multiple APs with similar signal strength. The effect is similar to when a car radio picks up signals from multiple radio stations broadcasting on similar frequencies.

One way to avoid this issue is with band-steering technologies that reduce traffic on the crowded 2.4GHz band by shifting capable devices to the less-congested 5GHz band. This technique, in combination with directional antennas,



high minimum bit rates and low power settings, can provide a good deal of capacity while limiting interference.

High-capacity Wi-Fi planning must also account for variables such as overprovisioning for variations in traffic patterns, optimal use of the wireless spectrum, load balancing, Quality of Service and other factors. This involves careful planning in order to integrate the right number of APs to handle the increased usage without introducing interference.

Professional Planning

A technology-neutral managed network services provider will typically begin the design process by interviewing stakeholders to learn the types and numbers of devices and applications that are being used. This helps in determining the aggregate bandwidth required in the coverage area.

The next step is an onsite survey, which usually involves physically walking around the site and measuring signal strength in various locations in order to build a coverage map. A sweep with a spectrum analyzer will also identify any sources of radiofrequency interference.

Software-driven predictive site surveys now provide an even clearer picture by creating 3-D models of the environment with network simulations and heat maps that give a visual representation of anticipated signal strength and application throughput. A major benefit of predictive modeling is the ability to quickly simulate multiple deployment scenarios and narrow the possibilities to the most-promising alternatives.

Coverage-based WLAN designs were meant to accommodate the occasional wireless user, but they no longer meet modern demands. There are now more mobile devices in the world than there are people, and wireless networks carry more than 100,000 times the traffic they did in 2008. Wireless directly impacts economic growth and productivity, and businesses now rely upon devices and services that didn’t even exist 10 years ago. Evolving design principles focused on capacity requirements can help ensure WLAN performance meets today’s requirements.

Name Dropping

High-profile breach illustrates the need for identity and access management solutions.



Cybersecurity analysts have determined that Hillary Clinton’s campaign chairman was duped into giving up his Gmail password, allowing hackers to access his account. John Podesta reportedly responded to a fake “account reset” phishing email, entered his login information and promptly exposed thousands of messages related to the U.S. presidential campaign.

In gaining worldwide attention, the attack brings renewed focus on the importance of protecting user credentials. Sixty-four percent of all data breaches across the globe are the result of identity theft, according to a recent study by the digital security firm Gemalto.

That’s no surprise. Hackers largely have two primary ways to gain unauthorized access to networks and accounts — exploiting code vulnerabilities or stealing credentials of valid users. Since the first option requires some specialized skill, Gemalto executive Jason Hart says stealing credentials represents “low-hanging fruit” for cyber criminals.

“Hackers have continued to go after both low-hanging fruit and unprotected sensitive personal data that can be used to steal identities,” said Hart. “The theft of user names and account affiliation may be irritating for consumers, but the failure of organizations to protect sensitive personal information and identities is a growing problem.”

Taking Control

To combat this problem, organizations are boosting investments in identity and access management (IAM) solutions that allow them to exert more control over information access. Grand View Research projects the market for IAM solutions will experience a compound annual growth rate of more than 18 percent to reach a value of \$24.55 billion by 2022. Global Market Insights expects similar growth, projecting a \$26.74 billion market by 2022.

IAM tools provide a framework for managing users and access privileges across the enterprise by bundling user provisioning, password management, strong authentication, single sign-on and other technologies into comprehensive platforms. They streamline the creation, maintenance and use of digital identities, integrating business processes with the supporting technology needed to effectively manage end-user attributes, credentials and entitlements.

Surging use of mobile apps as well as cloud services in order to optimize cost and drive productivity have increased the complexity of identity management. Additionally, a growing number of regulations are forcing organizations to more tightly restrict information access and to document the internal processes and IT controls in place to prevent unauthorized access to sensitive information. Organizations affected by these regulations must also be able to generate an audit trail that proves compliance to internal or external auditors.

The manual processes commonly used by organizations to add, change and delete user information and permissions are becoming woefully inadequate. In many cases, user identities must be updated across disparate applications and resources, leading to data entry errors and delays that increase the risk of internal security breaches.

IAM solutions decrease risk through increased automation. Such automation can potentially save millions of dollars per year in help desk-related costs. According to Gartner, a 10,000-person enterprise can achieve savings of about \$3.5 million in a three-year period by implementing an automated end-user identity provisioning system, primarily by cutting thousands of hours of IT and help desk time.

Comprehensive Approach

The ultimate goal of secure identity management is the application of corporate policies onto enterprise systems to ensure that users have appropriate access to the right resources at the right times. But that goal can't be realized without a comprehensive, strategic approach that considers all aspects of the identity infrastructure.

Identity information across an organization must first be integrated — but with respect for authoritative sources of identity. For example, it's not realistic to force HR personnel to stop using their internal applications in favor of a centralized identity repository and its associated interfaces. Standards are slowly being adopted within the identity management space, but most implementations still require substantial application integration efforts.

The prospect of implementing a secure identity management solution can be an imposing challenge for many organizations. Cloud-based IAM solutions offer an alternative approach for organizations that lack the manpower and expertise to effectively integrate and implement an on-premises solution. These solutions offer the typical benefits of cloud options, including predictable cost structure, reduced hardware and software deployment costs and simplified management.

Regardless of the deployment option, recent news events illustrate the importance of identity and access management. With stolen user credentials now representing the most common vector for data breaches, a comprehensive approach to identity management is becoming a near necessity.

“In this increasingly digital world, companies, organizations and governments are storing greater and greater amounts of data that has varying levels of sensitivity,” said Hart. “At the same time, it is clear that data breaches are going to happen and that companies need to shift from a total reliance on breach prevention to strategies that help them secure the breach ... That means ensuring user credentials are secured with strong authentication and sensitive data is protected with encryption so it is useless to the thieves.”

Privileged Accounts Need Extra Protection

In conjunction with identity and access management (IAM) solutions, organizations must take special precautions to protect “privileged account” credentials that grant certain users with administrator-level access to servers, security systems, network devices, databases, applications and other resources. If hackers were to gain access to privileged account credentials, they could potentially take full control of an organization's IT infrastructure, disable its security controls, steal confidential information, commit financial fraud and disrupt operations.

Despite the obvious risks, most organizations fail to adequately manage and secure privileged account credentials, according to a recent study from security firms Thycotic and Cybersecurity Ventures. Twenty percent of survey respondents said they have not changed the default passwords on their privileged accounts, and 40 percent said they continue to use the default user IDs. Thirty percent said they allow multiple administrators to share privileged account credentials.

“Weak privileged account management is a rampant epidemic at large enterprises and governments globally,” said Steve Morgan, founder and CEO at Cybersecurity Ventures. “Privileged accounts contain the keys to the IT kingdom, and they are a primary target for cybercriminals and hackers-for-hire who are launching increasingly sophisticated cyber-attacks on businesses and costing the world's economies trillions of dollars in damages.”

Security experts recommend that organizations create unique credentials for each privileged account user, require a unique strong password for each account, and require multiple levels of approval for password changes. Administrator access should be granted using a “least-privileged access” policy, and privileged account activity logged to detect attacks and ensure compliance with policies and procedures.

A good place to start improving security of privileged accounts is with an inventory of all such accounts and which users have access to them. The next step is to understand the level of access that is required by various users and roles, and establish policies based upon those requirements. Granting full administrator access should be the rare exception rather than the rule.

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