

THREE CRITICAL CAPABILITIES FOR CSPS TO DELIVER INTERNET OF THINGS PROFITABILITY

EXECUTIVE SUMMARY

Communication service providers (CSPs) are capitalizing on enterprises' demand for Internet of Things (IoT) solutions. And while there are a lot of opportunities, CSP's IoT business units are faced with challenges in meeting profitability metrics. In this whitepaper, we will discuss three capabilities that CSPs can use to drive profitability while helping their enterprise customers lower operating costs and increase revenues with IoT solutions.




In a strongly competitive global economy, enterprises are:

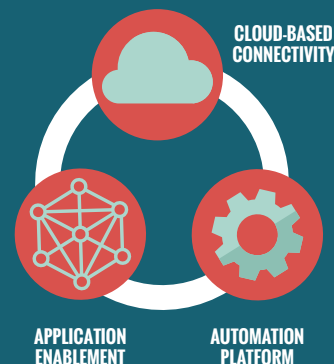
1. Carefully re-designing critical operational processes including logistics, inventory management, asset monitoring, equipment repair, fleet tracking and others to lower operating and capital costs. These improvements can make the difference between average and superior financial performance.

2. Continuously launching new products and services like predictive maintenance, connected cars, and smart tools based on a better understanding of customers' requirements to create long-term competitive advantage.

As trusted technology advisors and partners to enterprises, IoT CSPs have the opportunity to offer enterprises a complete IoT solution comprised of cloud-based/virtualized network connectivity, application enablement, and a robust automation platform. Improvements to these three areas can free a CSP's IoT business unit to deploy new network- and application-based services rapidly; create new customer segmented offers; layer-on additional security features; and lower ongoing costs through automation of operational systems and IoT transactional processes. These capabilities can address IoT CSPs' critical challenges of increasing speed to deploy new services, adding dynamic scaling both up and down, and enhancing overall solution security. All in

Benefits of integrated cloud-based network connectivity, application enablement, and automation platforms

-  IoT CSP speed in deploying new services
-  Scalability both down and up
-  Security to provide best-in-class end-to-end solutions
-  Long-term profitability



all, these capabilities will drive long-term IoT CSP profitability by lower operating expenses and increasing innovation.

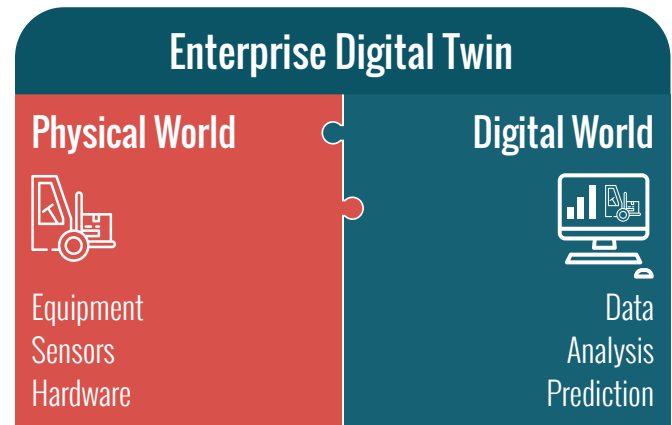
INTRODUCTION

The Internet of Things (IoT) invites enterprises to evolve their critical business processes. One of the most enticing benefits of IoT is an enterprise's ability to streamline operational processes including logistics, purchasing, supply chain, inventory tracking, personnel safety, asset maintenance and others. Cost savings from these types of changes are substantial, often resulting in 10%, 20% or more reduction in costs. In a globally competitive world, any significant cost avoidance allows an enterprise to reduce prices, gain market share and increase profit.

But the second benefit of IoT, the desire to create and sell innovative digital services alongside an enterprise's legacy, non-digital products is equally strong. The concept generally referred to as a **digital twin**, is a virtual representation of a physical asset. Bundling a non-digital product with services associated with its digital twin provides an enterprise with deeper, on-going relationships with their customers and the potential of capturing lucrative recurring revenue streams.

There are many, inspiring examples of enterprises creating this digital twin. Imagine:

1. A plastics manufacturer driving down maintenance costs 10% by monitoring sensor data with a 3D virtual representation - a digital twin -



of an actual injection molding machine located on the factory floor. The manufacturer can use this solution to predict better and prevent equipment failure before it occurs.

2. An international logistics company lowering shipping costs by tracking and securing high-value cargo containers from origination to destination using a virtual representation - a digital twin - of its fleet.

3. A welding equipment manufacturer not only selling welding equipment but also welding training services using real-time, worldwide, aggregated equipment usage data collected and visualized with the help of a digital twin. This solution could help welders safely reduce welding time by 5% while decreasing the use of raw materials used in welding by 5 to 10%.

CSP opportunity

CSPs have a tremendous opportunity to help enterprises facing this digital revolution, but CSPs find themselves challenged by slowed growth in their core businesses, competition from cable operators and legacy systems and

networks that hamper CSPs' ability to react quickly to enterprises' needs.

To quickly respond to the opportunities presented by digitization and IoT, the world's leading CSPs have created stand-alone business units solely dedicated to IoT. The leaders of these team have been given profit/loss responsibilities, a mandate to look for compelling acquisition opportunities and in many cases hundreds of employees to help drive success.

Leading IoT CSPs are recognizing that they have great opportunities to bundle additional products and services to their core offering of managed IoT connectivity. For example, some CSPs are offering services including

- IoT device management and data management
- IoT application development and support
- IoT application hosting
- IoT-specific cross-product SLAs
- IoT data and device security services
- IoT integration services

And the exciting introduction of 5G services and low-power wide-area networks (LPWAN) like LTE Cat-M1, NB-IoT, LoRaWAN, and Sigfox present even more opportunity. These new services, systems, and devices give CSPs the opportunity to sell complete end-to-end solutions by bundling various types of IoT communications with technology higher in the IoT technology stack.

IoT CSPs invest for the future

To help track operational and financial success, CSPs' IoT business units have implemented new metrics to track IoT product revenues, product attach rates, solution launch speed, IoT customer satisfaction scores and many other key performance indicators. For CSP's to deliver IoT services profitably and hit these business unit metrics, they will need cloud-based network connectivity, application enablement platforms, and automation systems.

New types of CSP IoT metrics to foster business unit growth

- 1 Connectivity revenues
- 2 IoT device management revenues
- 3 IoT platform revenues
- 4 Application development/hosting revenues
- 5 Product attach rates
- 6 Solution launch speed
- 7 Security and security audit measurements
- 8 IoT customer satisfaction scores

Cloud-based network connectivity

Cloud-based network connectivity such as NFV and SDN allows operators to cost-effectively scale their networks (critical in IoT) and provides them greater service agility so they can quickly and affordably launch new services. This cost reduction and agility allow CSPs to meet their IoT business unit metrics including new types of connectivity revenues, new products, and increased solution launch speed. Cloud-based network connectivity gives CSP real-time control of their network, speeds service creation and dramatically simplifies network operations. Switching from hardware- to cloud-based network connectivity can reduce capital expenditures by 55%, operating expenses by 90%, and total cost of ownership (TCO) by 75%.

Application Enablement Platforms

Application Enablement Platforms (AEPs) allow CSPs to build, launch and support a variety of solutions ranging from connected car to smart meters to factory automation on top of a standard set of tools and services. AEPs provide data management, device management and sometimes analytics and visualization capabilities. These technologies make IoT solutions more scalable, more reliable, less expensive to build and faster to deploy.

Automation

Automation allows CSPs to take manual processes and turn them into machine-run ones. Today, IoT CSPs' business units have many systems that aren't integrated and require supporting teams to perform tasks such as associating connectivity, device management

Benefits of Moving from MOPs to Automation

Drawbacks of MOPs

- Paper-based protocols
- Large operations staff
- Manual processes
- High operating costs



Benefits of automation

- Software-based config
- API integrations
- Automated processes



Adopting automation leads to

- 90% savings in opex
- 50% reduction in TTM
- Lower error rates
- Smaller operations staff



and application services for a new customer; provisioning devices in bulk; and applying security updates. Many processes at today's CSPs use Methods of Procedures (MOPs) to provide a means to capture in great detail what configuration changes need to be done, on which element, at what time and in which sequence. But MOPs are usually text-based documents ranging from a few to several hundred pages. Automation allows these tasks to be completed much more quickly with lower error rates and without wasting valuable time from operations teams. Service automation can translate MOPs into software-based configuration files that are pushed to any legacy or virtualized network function. In fact, IoT CSP

automation solutions can result in 90% savings in operational cost and 50% reduction in time to market.

Quantitative benefits of integrated IoT platforms

Switching from hardware to cloud-based connectivity can reduce total cost of ownership by 75%

Bundling AEP and traditional IoT CSP products can increase revenue by 15%

IoT CSP automation solutions can result in 90% operational cost savings

INTERNET OF THINGS CSP CHALLENGES AND SOLUTION

Today's IoT business units can rapidly deliver value-added services to enterprises while exceeding CSP IoT metrics like speed of new product launch, sales of services revenues, product attach rates, security measurements, and IoT customer satisfaction scores. They do this by addressing their top three challenges: a demand for fast time-to-market, scalable solutions, and best-in-class security.

Demand for Fast Time-to-Market

A manufacturing company rapidly experiments. Forward-thinking manufacturing companies are experimenting with different types of IoT projects to see which ones yield the best results. Frequently, many IoT deployment experiments are going on at the

same time including predictive maintenance deployments on factory robotics equipment; warehouse asset monitoring and worker safety systems using high-resolution video facial recognition; and GPS positioning devices on critical shop-floor assets. Some of these projects will succeed, yielding operational and capital cost savings of as much as 25%. And some will inevitably fail to deliver on promised results.

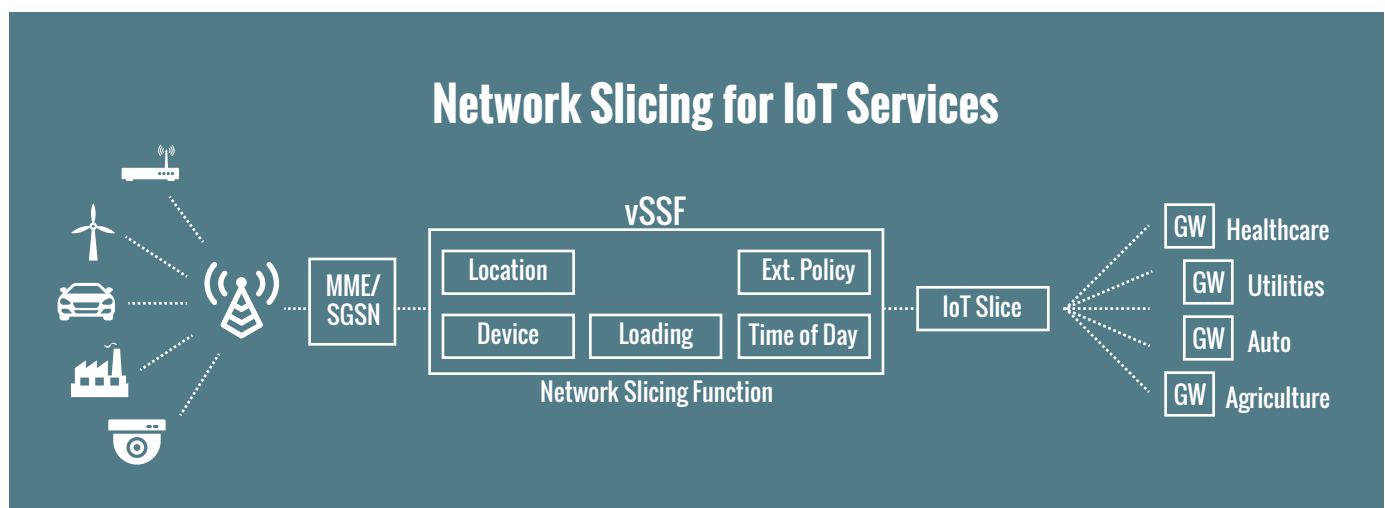
Leading IoT CSPs are helping to supply manufacturing companies with these types of end-to-end solutions. This experimentation by enterprises means that IoT CSPs are being asked to both spin-up and spin-down IoT solutions quickly while recognizing that their enterprise buyers may rapidly modify each IoT solution. Today, service creation and management rely on many proprietary CSP elements, platforms, interfaces, and protocols. Service creation is lengthy, typically 12 to 18 months. The process is error-prone, often requiring two to three months of planning and testing. And CSPs spend millions of US dollars in direct and indirect costs for these service creation and management capabilities on their legacy system. Most of the delays, errors, and costs are attributable to the fact that legacy systems require manual configuration through proprietary, non-interoperable interfaces.

Leading CSPs can launch IoT solutions in days using technology that offers automated, cloud-based, network and application management capabilities. Also, leading CSPs have a cost-effective way to quickly decommission IoT

solutions and shift resources to new solutions that have more traction. This fast-fail model allows IoT CSPs to be responsive to enterprise customer needs while maintaining an acceptable, internal cost structure.

To ensure fast time-to-market for their enterprise customers, CSPs benefit from integrated AEP, cloud-based network and automation solutions. First, leading IoT CSPs can take advantage of an application enablement platform deployed on top of cloud-based technologies. This makes it easy to deliver new and rapidly evolving IoT applications quickly. The pre-integrated services such as data storage, event processing and device management provided by an AEP make launching new services quicker and easier. For example, applications can be built and deployed more quickly with an AEP by leveraging robust device management capabilities that allow devices to seamlessly move through key lifecycle stages such as provisioning, deployment, maintenance, and de-provisioning.

And thanks to cloud-based technologies, a manufacturing customer or customers across any industry can quickly have their own IoT network in place using network slicing. Network slicing allows an IoT CSP to cost-effectively and rapidly create unique IoT networks and associated network and security SLAs for each customer or customer segment. IoT CSPs can reduce costs by 50% or more using network slicing to accelerate the time-to-market for new networks and services. Finally, use of automation virtually eliminates the need for manual workflows to move data between unconnected systems, perform repetitive configuration tasks and conduct routine maintenance. Having a centralized and automated way to manage processes between disparate systems reduces the amount of planning and testing while accelerating the IoT CSP's ability to improve profitability. This combination of application enablement, cloud-based network connectivity, and automation revolutionizes an IoT CSP's ability to deliver new and upgrade existing solutions quickly.



Need for Highly Scalable Solutions

A gas utility starts small and exponentially grows smart meters. Companies in heavily regulated, risk-averse industries such as oil and gas tend to start small in IoT, but the numbers of connected devices can be in the millions when it is time to ramp-up deployment. A gas utility company deploying smart meters reduces site visits and costs by:

- centralizing operations
- optimizing dispatch functions
- linking trouble tickets to customer service calls.

All in all, the gas utility saves, on average, one hour per site visited per year, a considerable cost savings across an entire regulated utility's territory.

From pilot to full deployment

Despite the apparent benefits of introducing IoT, utilities almost always launch small pilot programs to quantify both benefits and risks. Once the solution passes initial scrutiny, utilities look to expand the solution to possibly millions of meters, sensors, vehicle, and equipment.

To accommodate the needs of their customers, leading IoT CSPs offer hosted solutions that start small and then scale to support millions of devices per customer. The only way an IoT CSP can do this is with an IoT technology stack that can grow while maintaining a high degree of reliability, performance, and uptime. These are the types of solutions that customers in risk-averse verticals like utilities demand.

IoT technology stack



Applications

(metering, fleet management, asset tracking)



IoT Platform

(cloud-based connectivity, AEP, automation)



Connectivity

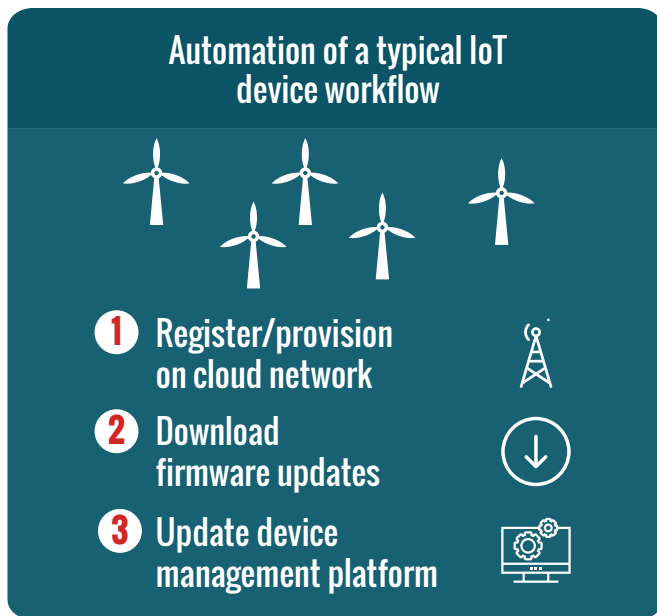
(2G, 3G, 4G, 5G, LPWAN, fixed-line)



Devices

(gas meter, vehicle, farm equipment)

Leading IoT CSPs are building technology stacks that scale by using an integrated cloud-based network, application enablement and automation solution. Incorporating cloud-based network connectivity and automation means that an IoT CSP doesn't need to worry about how its infrastructure will adapt to rapid on-boarding of new customers and aggressive growth of existing customers. Service provisioning errors often arise from the manual execution of repetitive, complex processes. An effective way to reduce these errors is to record successful deployments and automate their subsequent re-deployments. As we discussed above, this is accomplished by replacing long-winded, error-prone manual MOPs with configuration files that can be applied to virtualized and legacy network functions. This layer of abstraction enables fast, reliable, and repeatable creation and modification of services based on established best practices.



Require Best-in-Class Security

Smart cities balance IoT and the security needs of their citizenry. IoT solutions deployed by the public sector tend to collect a lot of information that must remain private. For example, smart cities collect data on residents using

- License-plate recognition for tolls and parking
- Video cameras for security
- Socio-economic data on neighborhoods and communities.

Security to protect sensitive information, as well as to protect against unauthorized use and abuse of connected things in a smart city are top of mind for municipality CIOs. Smart cities monitor and control lighting, traffic control systems and emergency response personnel and assets. Before deploying an IoT solution, technologists involved in smart city deployments spend copious time ensuring that grave

security and privacy risks don't outweigh the newly added benefits of IoT.

As trusted technology partners to public and private sector organizations, IoT CSPs have the challenge of creating a secure set of IoT solutions for their customers. It is not surprising that organizations investing a lot of resources to keep their IT assets secure are also reluctant to implement new IoT solutions unless they are comfortable with the cybersecurity posture they can provide. This is supported by MachNation research finding that enterprises' lack of in-house IoT security expertise and new/unknown security threats are their top two IoT security challenges. CSPs must guide their customers on this journey and demonstrate that IoT security is being taken very seriously,

Fortunately, CSPs are some of the most trusted organizations for providing secure technology solutions. IoT CSPs can use an AEP to centrally secure IoT data, manage access controls and detect suspicious behavior of IoT devices and applications. For example, an AEP provides granular role-based permissions for centrally managing device- and user-facing API access to IoT data across all IoT solutions offered by the CSP. Furthermore, AEPs integrate with enterprise backends and ancillary cloud services, creating a consistent and repeatable process for exchanging data with third-party services and across IoT solutions.

Enterprise automation further positions the CSP's IoT business unit for success. Instead of maintaining a large staff to continuously

monitor and maintain myriad of IoT solutions, automation makes the middleware and application lifecycle management less dependent on human capital and allows applications to be deployed through tested and replicable processes. For example, to maintain security across a varied set of IoT solutions, automation enables a CSP to run on-going, real-time security audits and penetration testing, and then patch vulnerabilities systematically.

CASE STUDIES

Let's review three instances where CSPs can find success with their enterprise customers by using integrated cloud-based networks, application enablement platforms, and automation solutions.

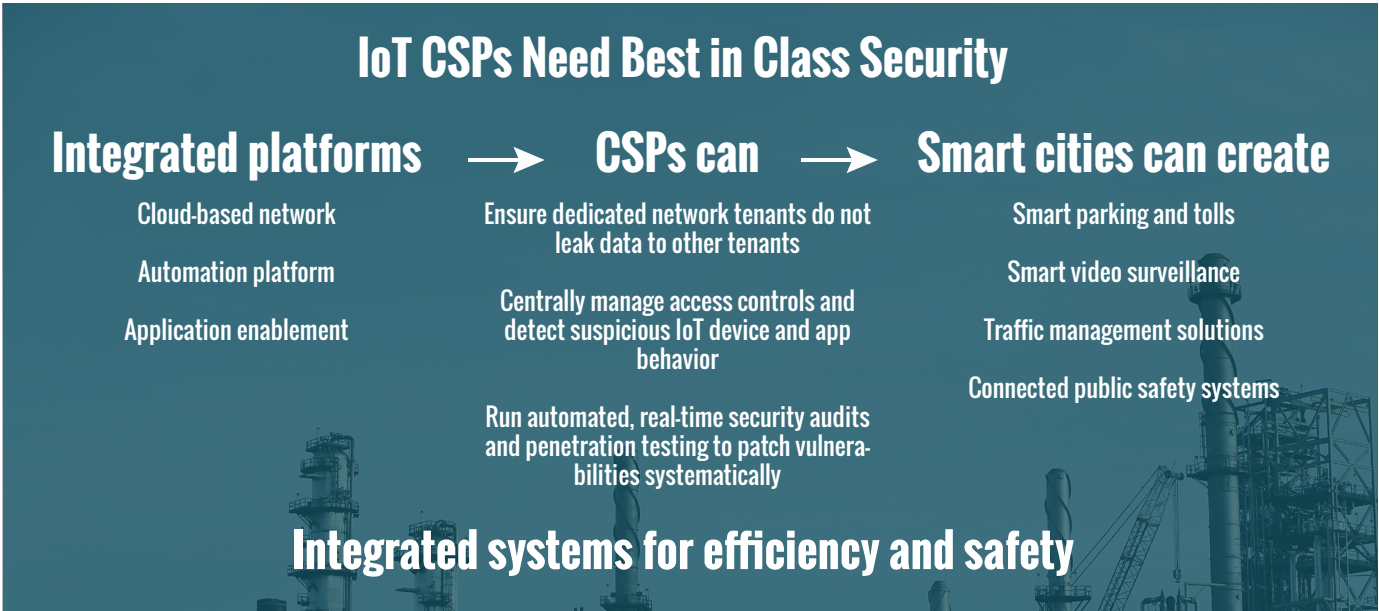
International CSP's automotive solutions lead the industry

With more than 1000 staff dedicated to IoT across many countries, this tier-1 CSP has

offered its innovative IoT solutions in the market for a decade.

There are two major trends that this CSP rightly forecasted for global IoT. First, this CSP recognized that customers would need different types of IoT networks for different types of IoT solutions. Customers would continue to deploy IoT solutions for all sorts of assets including automobiles, factories, power plants, petroleum pipelines, ships and heavy equipment worldwide. And the CSP needed a way to ensure it could rapidly, securely and cost-effectively create the right type of IoT connectivity – including 4G, 5G, fixed-line, or LPWAN.

Second, this international CSP recognized that customers would buy a complete IoT solution from a high-quality CSP if the solution were easy to deploy and support. Customers, especially in the automotive sector, required IoT solu-



CSP enables connected vehicle solution



**Service
Center**



**Integrated
Platforms**



**Connected
Vehicle**

Assign networks to applications
Establish security policy
Provision applications and services
Provide tracking, infotainment, diagnostics

tions for security, infotainment, e-call, engine diagnostics and more. By offering a packaged solution for these types of customers, the CSP would be able to capture a substantial share of the market.

So it chose to implement a cloud-based network. This technology could allow the CSP to rapidly spin-up the right types of networks – whether 4G, 5G, or LPWAN – in the right geographies for the right customers. Using cloud-based networks, it can ensure that it is matching IoT market demand with network availability.

And imagine the power of integrating cloud-based networks with application enablement and automation platforms. The CSP would be able to spin-up the appropriate network slices to match an enterprise customer demand in the automotive and transport sector while also creating a set of relevant application

enablement and edge device management offerings to tailor an application to the customer and automate the entire workflow process.

For example, a multinational corporation offering rental car services to consumers might want to offer a new set of offerings for its customers. These new services might include in-car Wi-Fi, anti-theft tracking of vehicles and a link to a city-wide connected parking availability service. CSPs like this international one that have taken the first step in using cloud-based networks can benefit from an AEP and automation to:

- spin-up the proper network on a city-by-city basis
- create customer accounts for various in-car applications including Wi-Fi, city-wide parking availability service, and anti-theft tracking

Tier-1 CSP using a cloud network, AEP, and automation



WiFi app
E-call app
Dealer app



City 1
City 2
City 3

AEP

IoT Network Slice

Automation

CSP OSS/BSS

- ensure that all machine data meets required security and privacy standards
- complete automated workflows in CSP operations systems

That's the value of an integrated cloud network, AEP, and automation solution.

Leading North American CSP offers industrial solutions to the world's leading enterprises

This CSP is one of North America's most pioneering IoT service providers. With a growing IoT business unit and a dynamic partner program, this CSP offers its enterprise customers a set of use-case specific, value-added IoT solutions.

This North American CSP recognized that IoT would have a significant impact on enterprises' critical business and operational processes. Enterprises would be able to collect, aggregate and analyze data from assets and use the insights to change processes including logistics, fleet routing, monitoring, repair, and others. By creating a set of use-case specific offerings using technology components from the CSP and its partners, the CSP would be able to expand its offering into more advanced services including eHealth, smart cities, fleet monitoring and more.

To continue to offer leading IoT solutions to enterprises, the CSP can take advantage of application enablement platform technology. The components of an AEP, including device and data management, allow a CSP like this one to bundle a new set of services to enterprise

CSP powers connected equipment solution



**Operations
Center**



**Integrated
Platforms**



**Connected
Assets**

**Provision applications and services
Monitor fleet and parts
Enable predictive maintenance
Leverage dedicated IoT network**

customers. For example, most enterprise customers value simple IoT device management: using an AEP allows a CSP to automatically update a fleet of IoT devices' firmware and software and apply security patches. CSPs can bring these value-added services to enterprises using an application enablement platform.

And imagine the value of integrating application enablement services with cloud-based networks and automation platforms. This leading CSP would be able to spin up the right type of network to match enterprise requirements in the industrial sector while also offering application enablement and device management offerings to provide valuable services to customers. And it could accomplish this with an automation platform that increases its overall return on investment and keeps ongoing operational costs low.

For example, an agricultural equipment manufacturer might want to launch a new set of

services around its core business of building specialty agricultural equipment. The new services would provide users of its equipment with fleet monitoring, equipment run-time data, equipment parts monitoring and predictive maintenance on parts' failures. These services would allow the manufacturer to provide real-time data to customers on how their agricultural equipment is being used. And when it is time for maintenance on equipment, the manufacturer would be able to proactively notify its customers so they can avoid lengthy and costly delays.

The equipment manufacturer might also want to use highly secure IoT connectivity in its factories to better monitor and control the robotics assets used to build its agricultural equipment. These assets would stream large quantities of machine data into an application enablement platform. The manufacturer might want to use the platform to build a set of applications for data analytics, predictive maintenance, and surveillance with integrations to its existing ERP solution.

With an integrated application enablement platform, cloud-based networks and automation platform, this CSP would be able to build a set of new end-customer services for this manufacturer to sell. The CSP could spin-up appropriate networks – 4G, 5G or LPWAN – for all of these IoT solutions. And it would be able to automate the creation of new services associated with each type of network and could even integrate network usage data and machine data in an analytics platform to offer

more sophisticated geo-tracking and security of agricultural equipment.

That's the value of an integrated cloud network, AEP, and automation solution.

Advanced Tier-1 CSP offers industry-leading IoT utilities solution

This CSP has long been a leader in offering a full slate of communications and enterprise value-added services. With its leading-edge IoT business unit, R&D facilities, innovation labs, and an excellent partner program, it is one of the world's foremost providers of end-to-end IoT solutions.

As one of the dominant technology providers in the world, this CSP has long recognized that its enterprise customers expect a complete technology solution that addresses their key business needs. By providing a set of best-in-class technology components while providing flexibility for integrations, the CSP can able to capture a substantial share of IoT sales in sectors including industrial, energy/utilities, smart cities, healthcare, retail, public sector and consumer.

To offer this type of end-to-end solution in IoT, this CSP decided to create an application enablement platform. It would now be able to offer a set of enterprise and consumer applications through all of its channels. These applications coupled with the CSP's IoT managed connectivity would provide it a way to capture more wallet-share from buyers, lengthen the average IoT customer's lifetime,

CSP enables connected utility solution



**Operations
Center**



**Integrated
Platforms**



**Connected
Assets**

Offer network isolation for IoT segments

Provision application and services

Provide smart metering

Manage demand

Monitor assets remotely

and help bring its IoT technology into the operations technology (OT) side of its enterprise customers.

But leading CSPs are also investing in integrated application enablement platforms, cloud-based networking, and automation solutions. This would allow CSPs like this one to match customer segments to IoT applications and IoT network needs. By spinning-up the right network for each IoT use case and customer segment, this leading CSP would even more quickly be able to tailor its offerings and gain first-to-market advantage.

For example, an electric utility might want to deploy smart metering across its regulated region of a country. Spanning urban, suburban and rural markets, the utility might want to use various types of IoT connectivity including 3G,

4G, and NB-IoT to backhaul smart metering data from residences to its internal systems. Using cloud-based networks, this CSP could match the right utility customer with the right IoT network. So whether a meter is using a cellular or a narrow-band connection, this CSP could associate the customer with the right network.

Also, the utility might eventually want to offer new applications for demand management, monitoring of distributed solar generating facilities and a consumer-centric portal. This CSP could use its AEP to stand-up a series of energy-sector applications and then automate the delivery of the services to various utility customers based on local market needs. This solution allows CSPs like this one to serve their enterprise customers with end-to-end solutions.

That's the value of an integrated cloud network, AEP, and automation solution.

CONCLUSION

Enterprises are improving their businesses by carefully re-designing critical operational processes to improve financial performance and by launching new products and services to create long-term competitive advantage and innovate from product-led companies to product-plus-services companies.

Fortunately, CSPs can offer enterprises an integrated cloud-based network, application enablement solution and a robust automation platform. These technologies allow a CSP's

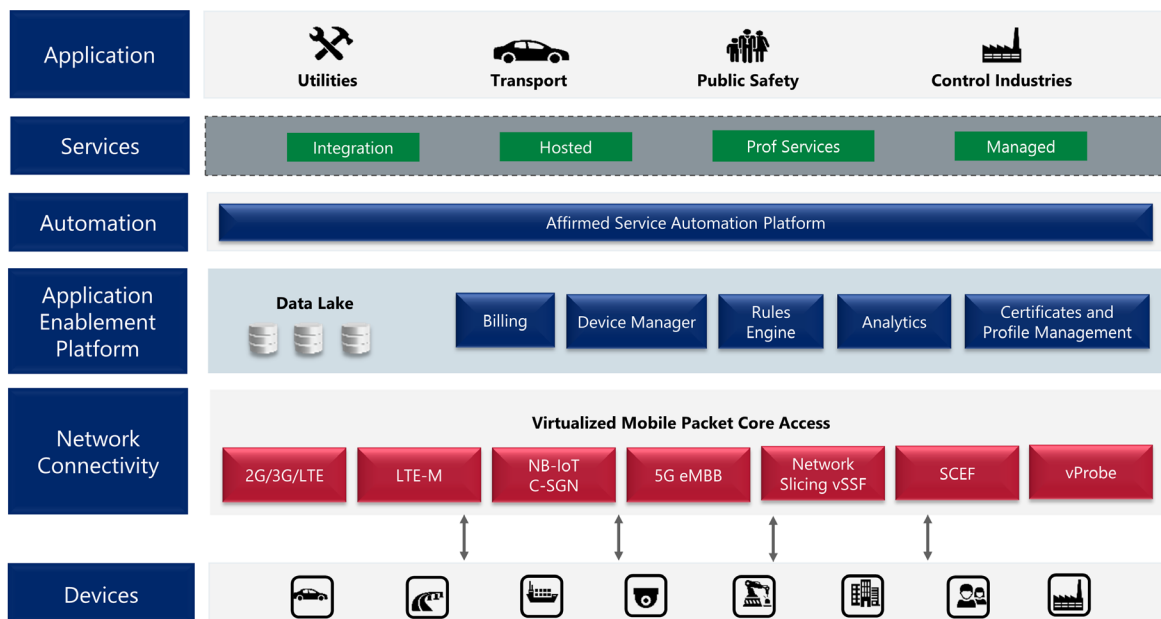
IoT business unit to deploy new network- and application-based services; create new customer segmented offers; layer on additional security features; and lower ongoing costs. By adopting these solutions, IoT CSPs can increase speed in deploying new services, scale both down and up, provide best-in-class end-to-end security, and drive long-term profitability. As the IoT market continues to evolve, CSPs are in the enviable position of bringing more IoT solutions to the market and capturing

ABOUT AFFIRMED NETWORKS

Affirmed's End-to-End IoT Mobile Core solution utilizes a fully virtualized architecture for hyperscalability enabling operators to support, manage and monetize IoT services. The solution is comprised of virtualized connectivity (LTE-M, NB-IoT, SCEF), an IoT Service Platform and IoT Integration Services.

The Affirmed IoT core offers a complete suite of VNFs including C-SGN, SGW, PGW, MME, Service Capability Exposure function (SCEF) and IoT Home Subscriber Server (HSS) providing operators with:

- A 3GPP-compliant, scalable, highly available solution to cover a wide spectrum of IoT Use Cases
- Automation, Virtualization and IoT specialization for profitably deploying IoT services
- Analytics, billing security, application enablement and device management
- Virtualized Connectivity from 2G, 3G, 4G, LTE, LTE-M Mobile Core and NB-IoT Mobile Core
- Options of control and user plan separation (CUPS) for improved network performance, flexible service creation and lower latency of IoT applications
- Reduction in time and cost of creating IoT services by combining virtualized connectivity and Affirmed Service Automation Platform
- Optimized traffic segregation provided by Affirmed's virtual Slice Selection Function so low, medium and high priority communications can traverse the network in an orderly and policy-based fashion



Affirmed's End-to-End IoT Solution



Affirmed also offers consultative, professional and managed services to help service providers quickly and effectively deploy IoT services in their network. Affirmed's IoT solution is part of leading operator networks including Du, Softbank, Vodafone and more enabling them to economically scale their networks and build on revenue opportunities.

To learn more on how network virtualization can transform your network, visit affirmednetworks.com or schedule a meeting with us at +1-978-268-0800.



MachNation is the only analyst firm exclusively dedicated to testing and researching Internet of Things (IoT) platforms, middleware, and services. MachNation owns and runs MachNation IoT Test Environment (MIT-E), the industry's only independent, hands-on, benchmarking lab for IoT platforms. MachNation specializes in understanding and predicting IoT technologies including their impact on digitization, hardware, communication services, applications, and support. MachNation specialists have provided guidance to the majority of the world's leading IT and communications firms.



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