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PIPELINE / VOLUME 21 / ISSUE 4

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MAXIMIZING MOBILE CONNECTIVITY

UNDERPINNING IOT, 5G, 6G AND BEYOND



SOLVING MOBILE LATENCY REALLY, REALLY SMART PHONES AI & NETWORK TRANSFORMATION



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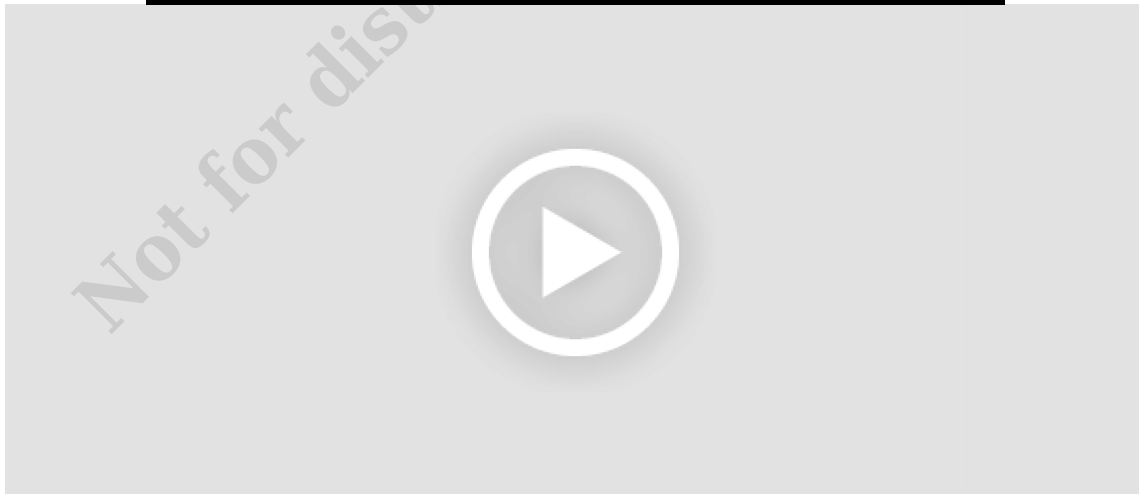
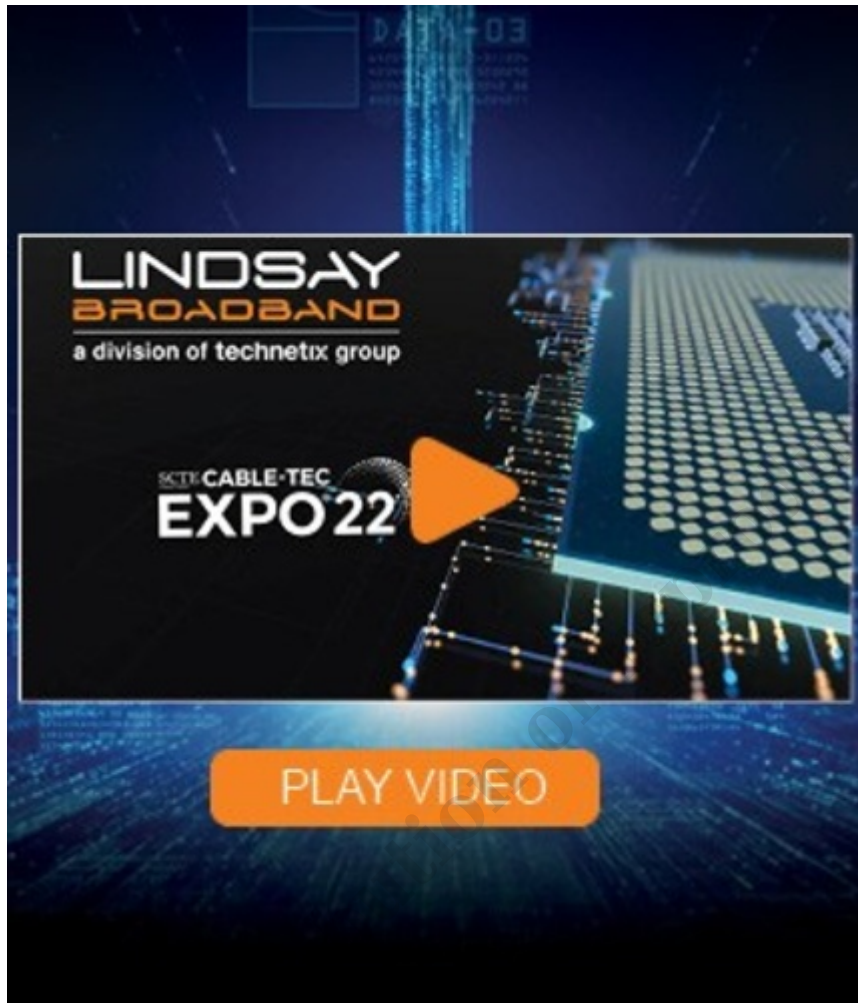
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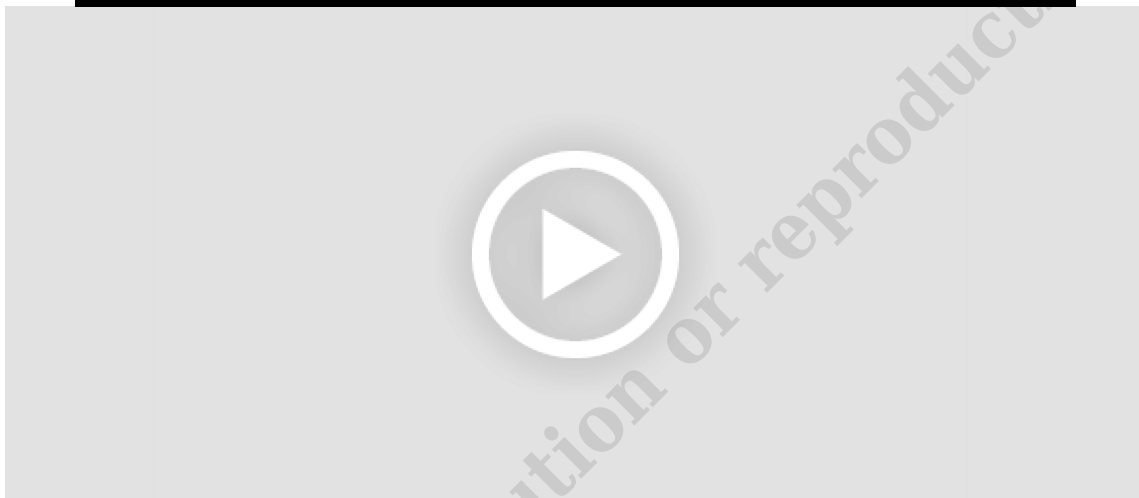
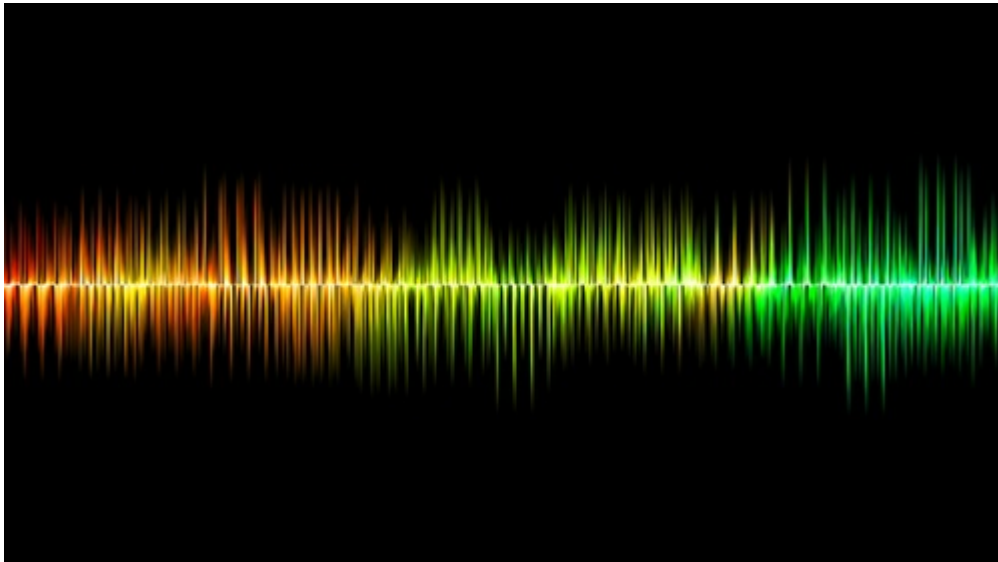
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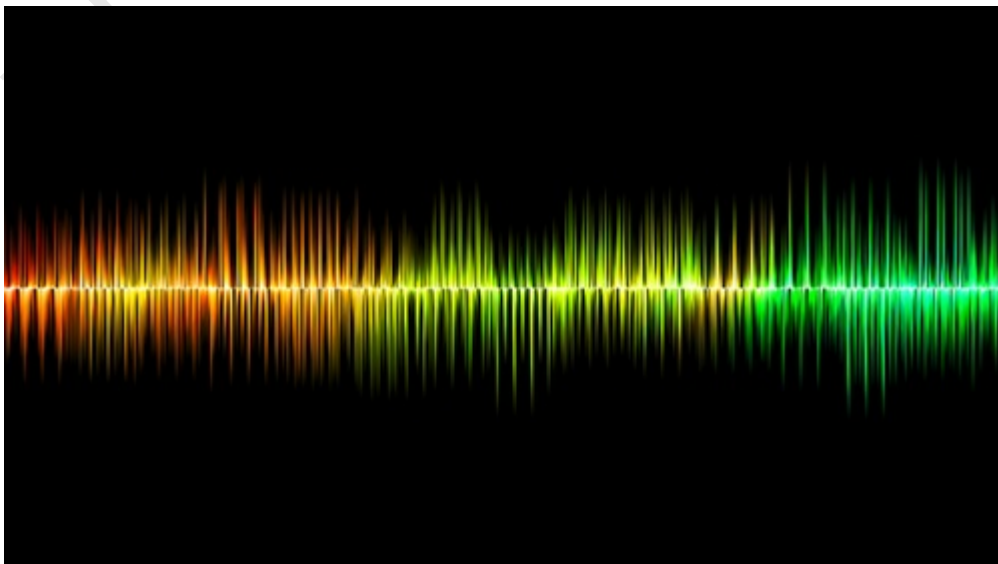
End-to-End Solutions for Broadband Networks

In case you missed Lindsay Broadband - a division of Technetix group at the SCTE Cable-Tec Expo, this video highlights the must-have, end-to-end solutions for your network.



Predicting Colonial Pipeline: Mitigating Risk and Compliance

Mitigating risk and compliance for lawful intercept using lawful intelligence is explored in this Pipeline article feature SS8. Learn how CSPs can comply with lawful intercept regulation, while empowering law information with critical, real-time data.





Podcast: The Evolution to 6G

The world's eyes are already looking forward to the potential of 6G. Demands resulting from innovative use cases, for instance specific requirements from different industries and other user groups, as well as overarching goals like sustainability, are driving the standardization and development of mobile technologies.

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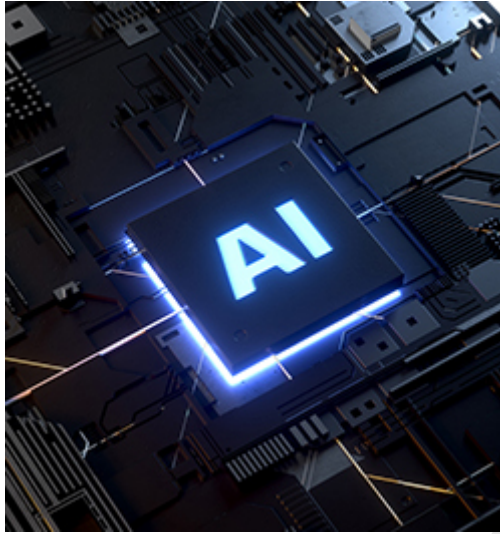
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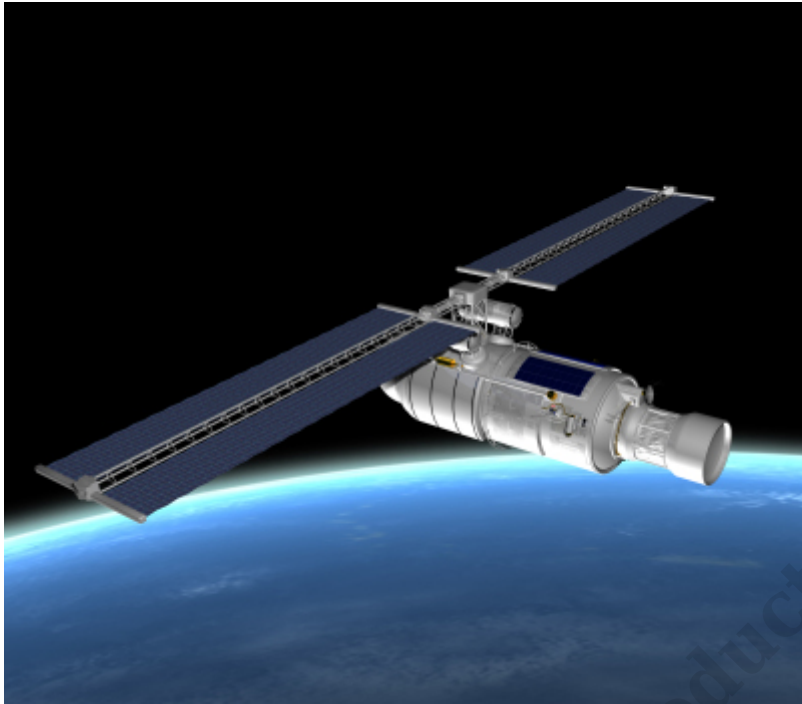
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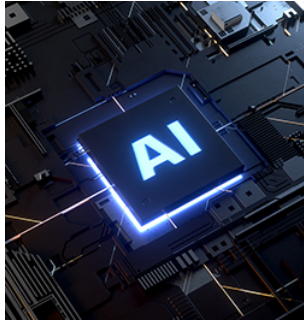
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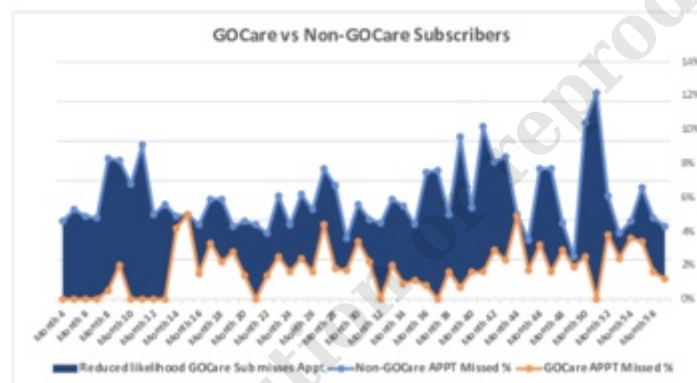
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Missed Appointment Analysis



When possible, it makes sense to compare the behavior of a customer opted in to GOCare vs customers that are NOT opted in to GOCare. Prior to the GOCare deployment, this operator averaged roughly 8% - 8% of subscriber appointments as "no access". AFTER the GOCare deployment, GOCare subscribers were routinely below 2% of subscriber appointments as "no access" or 70% fewer missed appointments for GOCare subscribers. As the opt-in rate increased, GOCare was successful in dramatically reducing the overall missed appointment rate. At an estimated \$150 cost per truck roll, the savings in missed appointments more than covered the cost of the GOCare offering.

Potential OpEx Impact:

Missed Appointment Analysis: Calculate an estimated 8% missed appointment KPI monthly, multiplied by an assumed \$150/truck roll. A 70% reduction in missed appointments represents an EBITDA improvement of significant revenue annually.

In addition to the savings of OpEx, assuming the "no access" improvement applies equally to new installs, the improved completion ratio will accelerate revenues at improved margins.

Sigma Systems and NDS

Orchestrating New and Unified Entertainment Experiences

Upgrading traditional offerings and deploying new hybrid/IP platforms are an increasing focus as service providers look to evolve to offer a truly personalized video entertainment experience to subscribers – anytime, anywhere and on any device. Sigma Systems and NDS have developed an integration partnership to help service providers achieve this goal by provisioning and delivering advanced video and entertainment services that attract subscribers and generate new revenue.

One Managed View of Video Access Entitlements

Critical to the success of leveraging the NDS solution portfolio for advanced TV/video services is the ability to seamlessly enable customers to access and view premium content. Sigma Systems provides the service orchestration for the necessary authorizations, entitlements and provisioning of NDS systems for subscribers through a single OSS solution – managing video conditional access rights, entitlements for premium content, VOD, DVR/PVR and also provisioning IP set-tops and residential gateway devices.

TV Anywhere Authorized to Enable Multiple Devices

Subscribers are increasingly demanding anytime anywhere access to their premium content on multiple devices from their TV, personal computer, and personal tablets such as the Apple iPad®. Sigma Systems provides comprehensive subscriber entitlements management, which is key in seamlessly delivering the multi-device, multi-room, TV anywhere entertainment experience to subscribers. Service providers benefit from service fulfillment that extends beyond subscriber service plans and profiles with a completely integrated view and management of users, devices, and cloud-application entitlements.

Effectively Migrate Subscribers from Standard to Premium Entertainment Packages

Delivering new entertainment experiences to subscribers doesn't have to involve an immediate and costly video network evolution. Sigma Systems empowers service providers to leverage existing video networks in order to move beyond linear for services such as digital TV, PPV, VOD and DVR/PVR through support for next-generation IPTV IP video platforms, like NDS, on a single integrated OSS service management platform. This co-existent service fulfillment environment manages the provisioning and activation of all enhanced entertainment services, helping service providers to launch new premium video services and bundled packages that drive new revenue and reduce customer churn.



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Company Fact Sheet

About Cycle30

Cycle30 provides hosted order-to-cash billing services for telecom, cable and utility operators in North America. Cycle30 is a subsidiary of GCI, Alaska's largest telecommunications and cable provider (NASDAQ: GNCMA).

Over 10 years, the Cycle30 organization helped transform GCI from a multi-product carrier of disparate services to a truly converged operator of bundled telecom services, consolidating nine billing systems, and increasing operational efficiency and competitive agility. The Cycle30 platform also enabled GCI to improve product strategy and successfully merge/consolidate multiple providers under a common billing/OSS system.

Proven over years of real-world operator experience with GCI, the Cycle30 organization now operates as a separate company, offering its converged billing platform as a hosted service to small-and-medium-size converged operators everywhere.

Cycle30 Services

Around its core billing engine, Cycle30 has integrated leading commercial software for ordering, provisioning and business support. This makes the Cycle30 hosted platform the only one of its kind in the world, with all the ordering, provisioning, billing and back-office revenue systems a converged provider needs for a complete order-to-cash system.

Management

Jim Dunlap – President
Ariel Baird – Business Operations
Andrew Dunn – Application Architecture
Wendy Gonzalez – Products + Services
Jeth Harbinson – Global Sales
John Hegarty – Service Delivery
Isaac Szymanczyk – Communications + Marketing

Operations

Cycle30 manages all operations from its headquarters in Seattle. The primary data center is located in Aurora, Colorado, with recovery and on-demand data centers in Scottsdale, Arizona and Philadelphia, Pennsylvania.

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*The
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A whitepaper covering the current industry, opportunities, and requirements for a non-Tier 1 Cable MSO entering the business services market.

Completed March 1, 2012

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IP Video Services Accelerator

Sigma Systems' IP Video Services Accelerator is a robust solution enabling cable service providers to extend video service offerings to deliver an enhanced and unified entertainment experience.

Without a doubt, the enhanced entertainment experience over IP video networks is emerging as the "next big thing" for service providers as over-the-top (OTT) content, Internet video and 3rd party applications continue to threaten customer loyalty. Gone are the days of just delivering traditional video offerings as cable service providers begin embracing the opportunity to create new business models and deliver an exciting, personalized multi-screen experience to subscribers. But without the proper supporting service fulfillment foundation, the accurate delivery of this experience is a significant challenge for cable service providers.



Simultaneous Linear & IP Video Provisioning & Support

The IP Video Services Accelerator provides a service fulfillment solution that simultaneously provisions and supports both linear and IP video networks to deliver digital TV, PPV, VOD, DVR/PIVR, Internet Video, OTT content, and 3rd party applications. This unique integrated OSS service management solution eliminates operational silos and provides seamless order management, provisioning, and entitlement management across all technologies, services, and systems.

Simplify All-IP Video Migration

By supporting a hybrid linear and IP video network that provisions all video services, the IP Video Services Accelerator gives you the ability to simplify and implement a logical migration strategy from legacy to all-IP video. You can manage this migration at the pace of your business and benefit from the flexibility to migrate in stages by managed service area, network segmentation, and even customer profile. With the IP Video Services Accelerator you can rapidly launch enhanced entertainment services and migrate linear video subscribers to a common OSS back-office solution when your business is ready.



Conversing with Your Customers

Turning call centers into profit centers through the power of real-time decisioning

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Jeff Michelson - Vice President of Global Marketing,
Customer Analytics & Interaction,
Pitney Bowes Software



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ASSURING NETWORK BUILD INTEGRITY IN NEXT GEN NETWORKS

**Reducing Management Costs and
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never underestimate the power of identity

hackers in an increasingly vulnerable digital world

With just a click, the power of the digital economy permeates nearly everything we do. Evolving well beyond eCommerce and mBanking, the connected society includes social media, video subscriptions, file sharing, ride hailing, and home stay, all of which have quickly become a regular part of our lives every day. While the convenience is alluring, the risks can be alarming. These applications often contain payment and other confidential information that need to be secure in order to ensure that only the right people see properly and have access to the information or assets involved. To continue to protect further, applications are constantly trying to improve the user experience by reducing the friction in the authentication process. Unfortunately, making it easier for the customer is also making it easier for fraudsters.

"Hackers can have access to your bank accounts, bitcoin, payment services and many other aspects of your digital life before anyone is the wiser."

According to an article by CBS News New York, a woman lost more than \$30,000 USD when a fraudster posing as her bank took over her account. The article says the scammer did this by telling the woman her account was compromised, then sent her text messages to change her password - giving the scammer access to her account. Scams can have access to your bank accounts, bitcoin, payment services and many other aspects of your digital life before anyone is the wiser. That is a powerful proposition for fraudsters.



Clearly, the digital world is increasingly vulnerable. Fraud is getting progressively sophisticated and more difficult to prevent, resulting in billions of dollars in financial losses annually. Victims are not only unsuspecting senior citizens and elderly, connected millennials, but also occasional smartphone and one-time consumers. Even the chief technologist of the very organization vested with the responsibility to protect consumers by stopping unfair, deceptive or fraudulent practices in the marketplace has been a victim of fraud. Interestingly, the telephone number, which is the entryway for much of this fraud, is being exploited by adept criminals in novel ways. Fortunately, the victims no longer need to be victimized because much can be done to protect consumers from this type of identity theft and related harms.

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Technology for Service Providers

Navigating the Chaos: Identity Access and Configuration Management Strategies for SDN & NFV



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Leveraging Service Assurance Investments for CEM, Business, and Operational Insight

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Want to get where you're going without getting stranded? You need to ensure network integrity. Our solutions allow you to know and control what's in the network, where it is, how it's configured, and who can access it.

Know where you're going

The reconfiguration of networks — whether LTE, fiber, or optical — replaces centralized architectures with highly distributed functions. While these new networks are designed to increase flexibility and profits, they do add a new level of complexity to the network. Suddenly, you're maintaining far more hardware and software configurations and are left exposed to the types of risks that can lead to outages and degraded customer experience. Nakina Systems' solutions power integrity in the world's largest networks, and they are provided in partnership with the world's largest and most advanced equipment manufacturers.

Chart your course

Nakina Systems and our integrity platform partners deliver software solutions that ensure your network is always headed where you intend.

Together, we help our customers:

- Accelerate network upgrades and new installs by providing a baseline readout of network elements software configuration before and after the upgrade.
- Reduce the 'drift' between the gold standard network design and the network in operation through call log auditing, discrepancy checking, and locking down the network with centralized security management and
- Improve asset utilization and reduce network hardware maintenance expenses by identifying discrepancies in inventory and asset records through automated network discovery.

Nakina Network Integrity Management Solutions empower next-generation networks to deliver on their promises.

Our customers roll out services more rapidly, upgrade networks with less effort, and experience fewer outages because they partner with Nakina Systems.

Pick the right navigator

Nakina Systems takes a unique approach to the competing challenges of expanding networks and shrinking resources. By focusing on the issue of network integrity, we have freed millions of dollars from customer networks, helped service providers to deliver new offerings faster and have helped decrease service outages across our customer base.

We are:

- Responsive to our customers, providing solutions to problems faster, more creatively and more flexibly.
- Aggressive in our search to add value to our customers' operations.
- Consistently and relentlessly improving our technology, practices, and processes to achieve success for our customers and other stakeholders.

Nakina Systems has developed its framework and applications working with the world's most demanding customers in the world's largest and most complex networks. We understand carrier requirements, settings, scalability, and reliability.



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Case Study: GSM wireless network build

PROJECT

GSM wireless network build

SITUATION

When a converged telecommunications services provider faced the sale of its wireless partner properties to a large, national wireless company, it chose to expand its market penetration by building its own wireless GSM network.

The provider engaged Cycle30 to build out, integrate, and deploy all of the BSS & OSS functions to support the new GSM network and wireless services in three metropolitan areas, over an aggressive nine-month timeline.

CHALLENGE

Critical to the ROI of the buildout was the ability to successfully acquire a number of new wireless subscribers, while retaining 99 percent of existing subscribers from the old MVNO network.

Cycle30 planned and delivered all necessary BSS, OSS and conversion functions to support two separate network and product go-live dates, dictated by a strict schedule from the provider acquiring the partner assets.

In addition, severe winter conditions across the provider's geography forced Cycle30 to compress the timeline in order to complete the conversion before winter.

RESULTS

- Cycle30 conducted end-to-end testing of the network and conversion process to ensure a seamless customer experience while finishing the deployment
- Delivered the project on time
- Delivered the project 10 percent under budget
- Cycle30 flexed to the provider's network deployment needs, so that BSS/OSS and conversion activities accelerated progress instead of impeding it
- Provider successfully converted 48,000 subscribers to its new GSM wireless network
- Customer conversion retained 99.2 percent and added 42,000 new subscribers.

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Distributed cell site gateway from ADVA and Edgecore
 Open and disaggregated path to 5G infrastructure



As innovation and growth in packet and wireless networks continues to accelerate, communication service providers (CSPs) and mobile network operators (MNOs) no longer have time to wait for their vendors to come up with higher capacity devices that meet the latest requirements. Now there's a new way to grow networks that combines the agility of software-based feature development with the performance and economics of bare-metal switches. Building a network for 5G access is now as simple as selecting a hardware component with higher capacity and installing the network operating system (NOS). And to help, ADVA and Edgecore have combined forces to deliver a disaggregated cell site gateway (DCSG) solution that provides the required features in an open and multivendor fashion.

Meeting the bandwidth demand in 5G

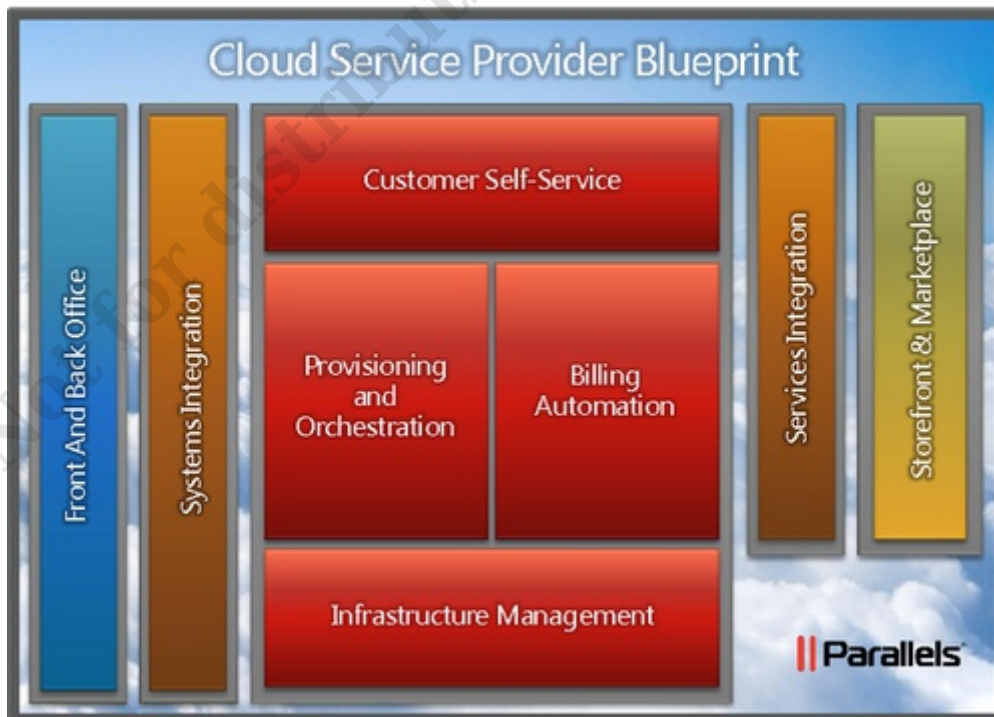
Access speeds will increase dramatically for 5G networks, and base stations will move from 1GbE to 10GbE and 25GbE uplink interfaces. Backhaul networks must rapidly grow to 100Gbit/s aggregated capacity. MNOs need to design and operate these higher-speed networks with proven technologies and established processes. At the same time, MNOs need to make their networks much more agile to unleash the power of 5G new radio (NR). They need to move from hardware-centric, static networks to software-defined architectures. With the latest software-defined networking (SDN) and network functions virtualization (NFV) network technologies, disaggregated radio architectures and networking

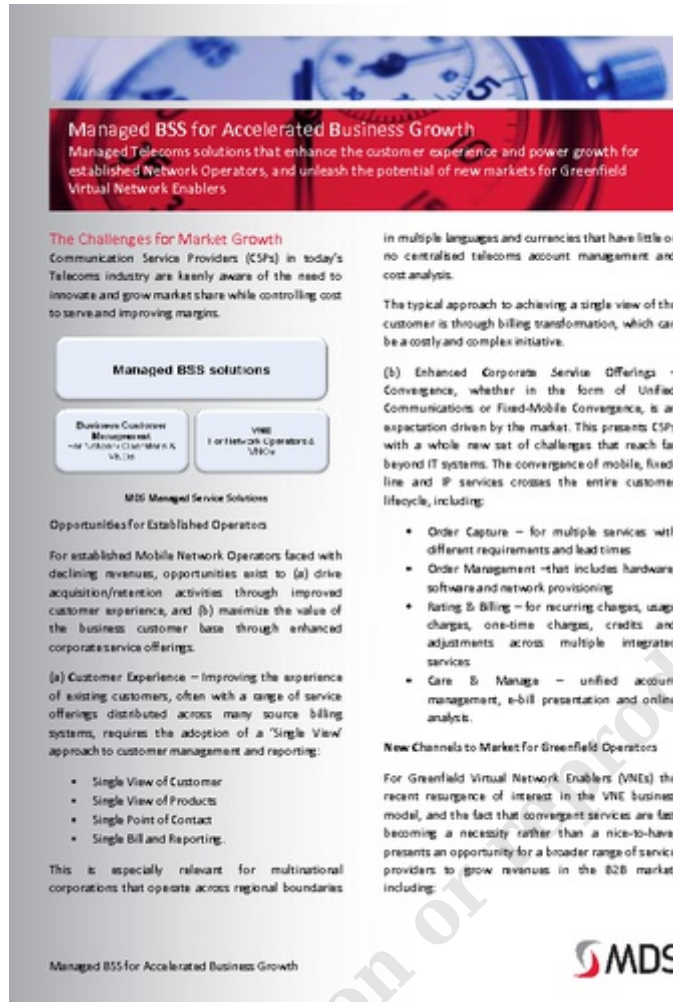
are paving the way for open, agile, and efficient mobile ecosystems.

Moving from closed to open

MNOs and CSPs want to break open single-vendor silos to increase competition and reduce cost. That has led to increasing interest in disaggregated networking with packet network devices implemented as white box switches and open network operating systems. That's why the Telecom Infra Project (TIP) defined the DCSG as well as OpenRAN. Both are essential to supporting the move to next-generation radio architectures.

According to TIP's [DCSG Technical Specification](#), the DCSG is "an open and disaggregated platform based on commercial/off-the-shelf components and





Managed BSS for Accelerated Business Growth
Managed Telecoms solutions that enhance the customer experience and power growth for established Network Operators, and unleash the potential of new markets for Greenfield Virtual Network Enablers

The Challenges for Market Growth
Communication Service Providers (CSPs) in today's Telecoms industry are keenly aware of the need to innovate and grow market share while controlling cost to serve and improving margins.

Managed BSS solutions

- Business Customer Management – for Network Operators, VNE, etc.
- VNE for Network Operators, VNEs

MDS Managed Service Solutions

Opportunities for Established Operators

For established Mobile Network Operators faced with declining revenues, opportunities exist to (a) drive acquisition/retention activities through improved customer experience, and (b) maximize the value of the business customer base through enhanced corporate service offerings.

(a) Customer Experience – improving the experience of existing customers, often with a range of service offerings distributed across many source billing systems, requires the adoption of a 'Single View' approach to customer management and reporting:

- Single View of Customer
- Single View of Products
- Single Point of Contact
- Single Bill and Reporting.

This is especially relevant for multinational corporations that operate across regional boundaries

in multiple languages and currencies that have little or no centralised telecoms account management and cost analysis.

The typical approach to achieving a single view of the customer is through billing transformation, which can be a costly and complex initiative.


(b) Enhanced Corporate Service Offerings – Convergence, whether in the form of Unified Communications or Fixed-Mobile Convergence, is an expectation driven by the market. This presents CSPs with a whole new set of challenges that reach far beyond IT systems. The convergence of mobile, fixed-line and IP services crosses the entire customer lifecycle, including:

- Order Capture – for multiple services with different requirements and lead times
- Order Management – that includes hardware, software and network provisioning
- Rating & Billing – for recurring charges, usage charges, one-time charges, credits and adjustments across multiple integrated services
- Care & Manage – unified account management, e-bill presentation and online analysis.

New Channels to Market for Greenfield Operators

For Greenfield Virtual Network Enablers (VNEs) the recent resurgence of interest in the VNE business model, and the fact that convergent services are fast becoming a necessity rather than a nice-to-have, presents an opportunity for a broader range of service providers to grow revenues in the B2B market, including:

Managed BSS for Accelerated Business Growth



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