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**MANAGING CLOUD DATA**

UNLEASHING

**5G**

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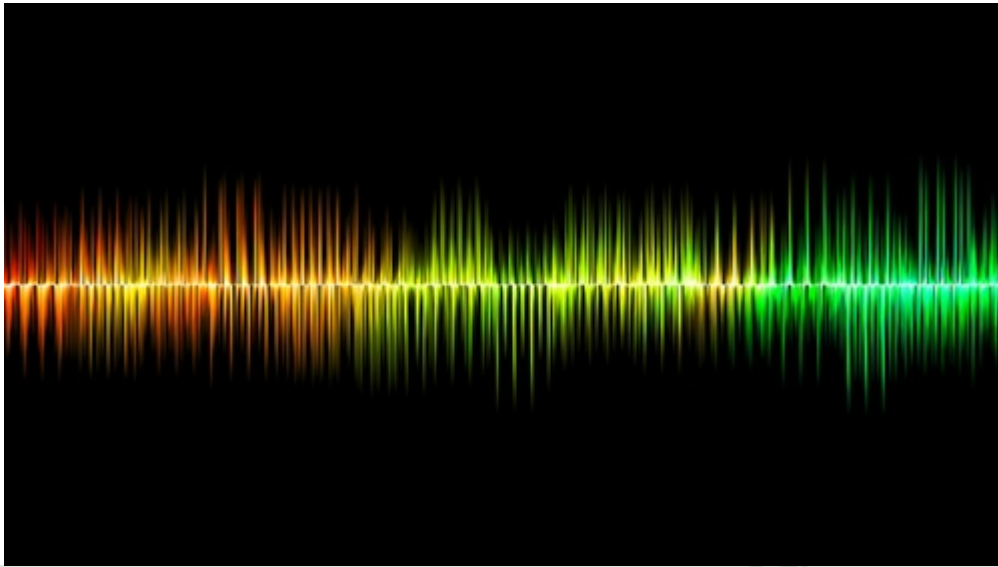
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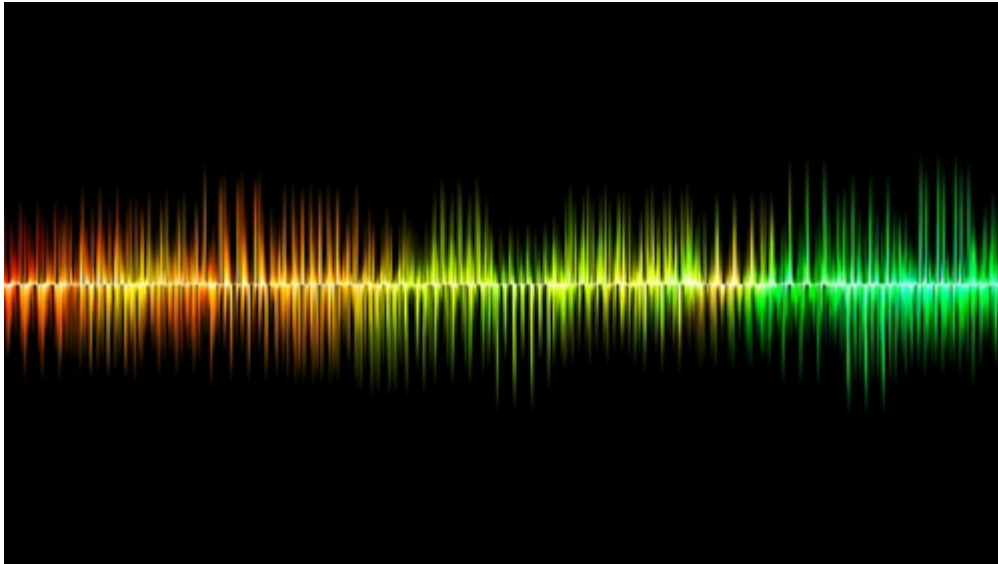
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### **Predicting Colonial Pipeline: Mitigating Risk and Compliance**

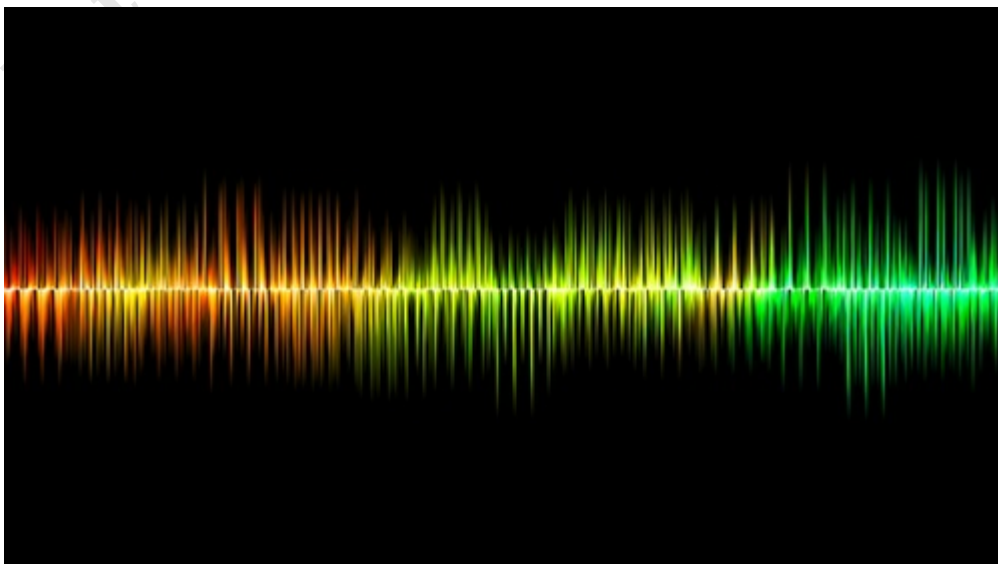
Mitigating risk and compliance for lawful intercept using lawful intelligence is explored in this Pipeline article feature SS8. Learn how CSPs can comply with lawful intercept regulation, while empowering law information with critical, real-time data.





### 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.





### Podcast: AI Gets Personal

Providing an AI-driven network and customer experience and a 360-degree view of the customer journey, including use cases such as gaming, is explored in this Pipeline article by Nokia.

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PANEL DISCUSSION

## The Impact of Transformation

A Dynamic Panel Discussion Featuring  
The Industry's Top Thought Leaders

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## The Network Transformation Imperative

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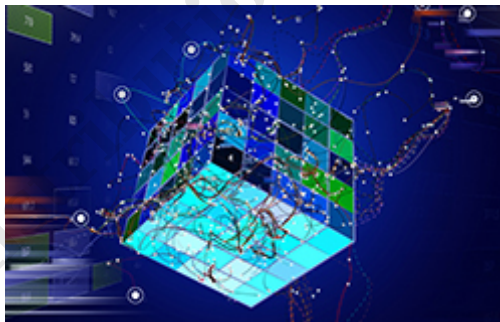
## Latest Articles

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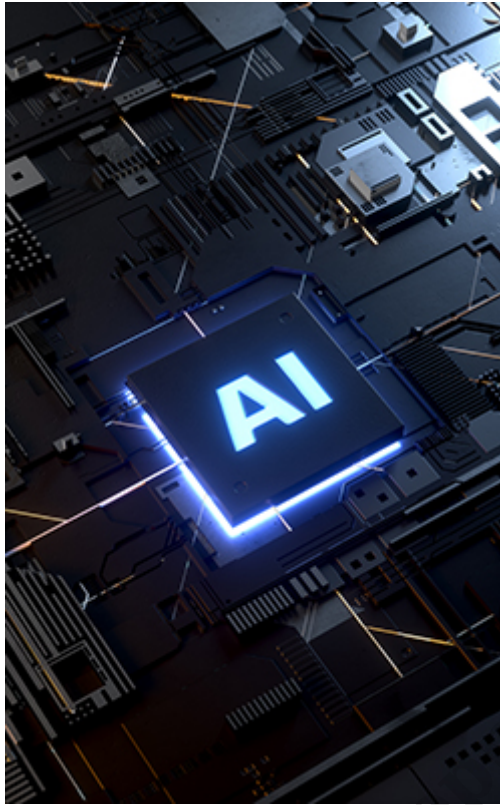
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Case Study  
**Mobily: Transforming their OSS  
landscape with Comptel solutions**  
January 2015  
Dean Ramsay and Justin van der Laede

Ref: RXB98

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## Mobile Video Policy Control

### Benefits at a glance

- Generate new revenue with mobile video services
- Create mobile video services tailored to specific customer segments
- Align revenue and network costs using dynamic policy controls

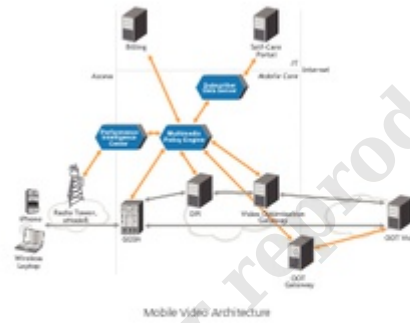


### Business Requirement

There is no question that video is both popular and consumes more network resources than almost any other application. A look at current data points tells the story: YouTube has become the second largest search engine. Mobile video is predicted to grow 66-fold from 2009 to 2014 and consume 66 percent of all mobile bandwidth by 2014. Clearly, finding ways to mitigate the impact of mobile video on the network in a way that still meets consumers' demands is critical to the success of mobile operators.

### Challenges

Previous network solutions for handling data services primarily centered on static service provisioning in which operators take a "one-size-fits-all" approach. However, with the advent of data-rich services like mobile video, that approach has a number of shortcomings. In fixed networks, geographical service demand can be accurately predicted and the network built out accordingly. However, mobile networks, by nature, enable movement, which makes it more difficult to predict geographical service demand and network build out. Moreover, operators are increasingly investigating and deploying tiered pricing plans, which offer end users a variety of service levels and options that go far beyond the "one-size-fits-all" static provisioning approach.



Brian Cappellari  
CTO & VP Engineering





## FSP 3000 OLS

### A versatile and truly open line system

5G and cloud-based applications offer enterprises, carriers and service providers enormous potential for growth. However, this continuous and rapid change also creates the need for more network capacity and flexibility. It's essential to build today's networks on an open, flexible and scalable optical layer ready to accommodate evolving demand and innovation. Featuring a fully modular and open design, our FSP 3000 open line system (OLS) provides complete versatility and best performance in metro, core and data center interconnect (DCI) applications.

#### Truly open

Open disaggregated optical networking is one of the industry's hottest trends. By decoupling terminal functions from the line system, this approach offers complete flexibility to adopt the latest technology when and where needed. Our FSP 3000 OLS is truly open, allowing total freedom to evolve and optimize each network layer separately. Network operators can leverage and expand their infrastructure at any time with the technology of their choice. What's more, with open and standard interfaces, our FSP 3000 OLS easily integrates into software-controlled networks.

#### Build your own OLS

Our FSP 3000 OLS empowers network operators to create the solution that meets their exact requirements. With a modular architecture, multiple amplification and multiplexing options, and different chassis sizes, our FSP 3000 OLS enables customized solutions. Operators can simply mix and match the optimum filters and amplifiers and pack them into the best-fitting shelf. This makes our FSP 3000 OLS ideal for any type of network infrastructure.

#### Future-proof investment

Coherent modulation schemes are becoming increasingly diverse to maximize transport network capacity and minimize the cost-per-bit of transport. Flexible terminals with variable modulation formats and baud rates enable higher capacity-per-ohm. The ultimate network performance relies also on line system capabilities, and that's why open line systems have increasingly become important strategic assets. With a combination of high-performance features, our FSP 3000 OLS transports any coherent modulation format as well as all varying signal baud rates with best performance. The high-resolution frequency and modular architecture of our ROADMs guarantee a future-proof OLS that can scale and accommodate any modulation format and baud rate. What's more, our FSP 3000 OLS provides a new level of flexibility with configurations able to support direct detect technologies.

#### Your benefits

- ▶ **Open hardware**  
No technology or vendor lock-in; successfully tested in multi-vendor environments
- ▶ **Open programmable interfaces**  
Easy integration into software-defined networks with open, programmatic APIs
- ▶ **For any type of network infrastructure**  
Modular design with multiple amplifiers and filter options to meet your exact requirements
- ▶ **Purpose-built components**  
Amplifiers and filter options engineered for metro, core and DCI-specific demands, and optimum transport of latest innovation, e.g., 40GZR and high baud rates
- ▶ **Visualization and control**  
Comprehensive monitoring and diagnostic tools, spectrum visualization and fiber surveillance
- ▶ **Eco design**  
High-density design with low power consumption
- ▶ **Flexible footprint**  
Chassis sizes from 1RU to 12RU, ETSI / data center rack, AC/DC power options



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Ontology Real Time Inventory for NFV

September 2015

# W<sup>2</sup>CM Smart Replay

Near Senak, Product Manager, EXFO

## INTRODUCTION

Along with the phenomenal growth in volume of data on the mobile Internet, there has been an increase in the different types of data flowing through wireless networks. In addition to traditional types of data, such as file transfer protocol (FTP), hypertext transfer protocol (HTTP), voice-over-Internet protocol (VoIP), e-mail and video streaming, there has been a constantly increasing list of over-the-top (OTT) smartphone applications generating new types of data, including peer-to-peer (P2P) data from applications such as BitTorrent and Kazaa. In an effort to differentiate themselves, operators have also been offering their subscribers their own unique applications, which in turn contribute to the variety of data on wireless networks.

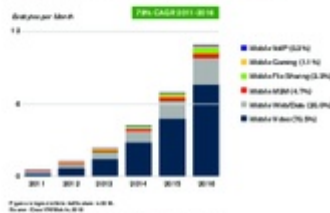


Figure 1. The explosive growth in mobile data.

This vast amount and variety of data has created a need for it to be managed effectively. There are several motivating factors to do so, chief among them being:

- ▶ Honoring service-level agreements (SLAs) and delivering committed quality of service (QoS) to customers
- ▶ Efficiently managing network resources
- ▶ Generating revenue as opposed to being just a "dumb pipe" for data
- ▶ Securing the network

Let's look at each one of these aspects in a little more detail.

## HONORING SLAs

Operators have SLAs with their customers to guarantee a certain minimum performance from their networks. To be able to meet these commitments, the network elements have to be able to ensure that the required amount of resources is made available when needed. A recent study has shown that 5% of users consume 60% of bandwidth. This type of usage pattern can endanger an operator's ability to meet its SLA commitments to the rest of its subscribers. Operators have a strong incentive to manage the data usage of such heavy data users (e.g., by throttling the throughput rates available to such users).



Figure 2. Mobile network operators (MNOs) need to proactively manage network usage.

Honoring SLAs may also mean being able to identify data associated with key customers and giving it preferential treatment in the network. There are strict guidelines in the LTE specifications about the handling of data with different levels of QoS. Gateways in the network have to correctly implement these techniques to ensure that committed QoS is delivered.

## EFFICIENT MANAGEMENT OF NETWORK RESOURCES

Another motivation for operators is to manage their CAPEX. Operators are making huge investments in building out their networks to keep up with the growth in data consumption. Unmanaged data usage coupled with the need to deliver on SLAs would result in operators having to deploy more equipment to handle the load. A better alternative is to manage the data usage. The LTE 3GPP specifications introduced the concept of maximum bit rates (MBR). The idea is to limit the maximum throughput used by a subscriber. This is a very critical technique for operators in order to prevent abuse of network resources by a few "bad" subscribers.

## REVENUE GENERATION

With an explosion in over-the-top (OTT) applications on the Internet, operators risk becoming mere "dumb" pipes carrying user data back and forth. This is not an enviable situation for operators, considering the enormous investments in infrastructure required to keep up with growth in data usage. Operators want to find ways to generate revenue from the data flowing through their pipes. They can do this by providing the same services as the OTT players, for instance voice-over LTE (VoLTE), but with significantly better and more predictable quality. Operators may want data associated with their own applications to be given preferential treatment as compared to equivalent OTT applications. Additionally, they can add value to the data already flowing through their network (e.g., by signing retransmission deals with service providers in exchange for prioritizing their data, or through targeted advertising based on the content of user data, similar to what Google does with Gmail).



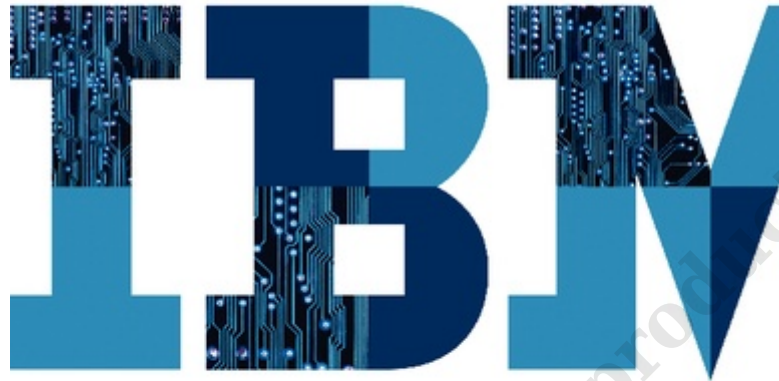


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## Delivering a new ROI for communications

*Return on insight in a big data world*



IBM

Whitepapers

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# Customer-Focused Experience Management Must Be an End-to-End Process



By Susan McKeel and Sheryl Kingstone | June 2011

## Key Takeaways

- The new market reality for communications service providers (CSPs) is to transform their business around their customers.
- Yankee Group believes enhancing customers' experience is CSPs' last remaining opportunity for real competitive differentiation.
- Today's CSP operations infrastructure is neither meeting the needs of customers, nor is it as cost-effective as the competitive market requires.
- CSPs must have an end-to-end perspective on customer experience.
- Intelligent, interactive operations software is key to delivering on this perspective.
- Transformation to customer-centric operations requires a process-based overlay to existing operations.

## A Good Customer Experience Is Essential in the Connected World

CSPs are experiencing pressure for a fundamental transformation due to the hyper-convergence of connectivity, media, mobility and devices. In a world where product differentiation leads to short-term success, customer-centricity is paramount. But unlike earlier times, managing customers' experience is not simply a matter of capturing customer information and order requests. Today's reality requires CSPs to evolve from an operational service strategy to a more customer-focused experience management model. This is the only way they can differentiate from the competition as they strive to increase customer loyalty and overall spend.

Likewise, CSPs are grappling with economic and ecosystem challenges. Iconic devices such as the BlackBerry and iPhone have stimulated customer demand for more sophisticated tools and services, changing their connectivity lifestyles. In the past, innovation was constrained by less feature-rich phones with architectures proprietary to specific CSPs. The new world order, however, is driving change across consumers, devices, data connectivity and application ecosystems (see Exhibit 1 on the next page).

## The Customer Is Now in Charge

Yankee Group first identified the concept of the Anywhere Consumer<sup>®</sup> in 2007 as a class of consumer that demands connectivity at the core of their every activity. This point of view influences their buying behaviors, from the devices they acquire and the services to which they subscribe to the applications they download.

Today, we sharpen our focus beyond Anywhere to connected experience. This takes customers to a new world of always-on connectivity, smart devices with intuitive interfaces and cloud-based content and applications, all delivered according to the customer's expectations, including:

- More channels of interaction, e.g., mobile and social networks
- Immediate delivery of content and applications
- The latest digital lifestyle solutions

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## Reports



**e-billing and Analytics Solution**  
Increase billing transparency and control, enhance customer experience and loyalty, reduce support costs, and deliver faster ROI.

**Customer Experience Competitive Advantage**  
Faced with the challenge of how to increase profitability, Communication Service Providers (CSPs) are increasingly focusing on customer experience as a way to differentiate from the competition, maximize revenues and reduce costs. Business customers represent a significant source of revenue for many CSPs and, as such, it's vital to provide high levels of customer service to attract and retain these key customers and maximize their lifetime value. The enablement of customer experience is an important factor in improving customer experience while improving efficiency and driving down costs.

In the continuing search for new revenues, CSPs have expanded the range of services they provide to their business customers to include mobile voice and data, fixed-line voice, IP data services — with a corresponding increase in billing complexity and, in some cases, a decrease in customer satisfaction due to the siloed presentation of billing information for each service type. As a consequence, CSPs are looking for ways to evolve their customer experience to new levels of interactivity with a single view of services through the provision of unified communication channels. To achieve this goal, CSPs have to be able to abstract the customer experience layer from the underlying billing and CRM infrastructure, which often means dealing with multiple complex legacy source data systems that can hinder the development and delivery of e-enabled customer experience.

**Customer Needs**  
In maturing markets, business customers are increasingly basing their purchasing decisions on service quality and support rather than on price alone. Hard-working managers are demanding access to systems and tools that enable them to become more productive, simplify their tasks, take control of their organizational spend, and allow them to effectively manage their relationship with the CSP. Specifically, these customers want to have convenient and secure access to their consolidated service and usage information in a single online location; with the ability to view summary spend information across their organization, view out of the box and custom reports and, drill-down to analyze the detail of service usage.

**MDS e-billing and Analytics Solution**  
MDS e-billing and analytics solution provides businesses of all sizes, from global corporate enterprises to SMBs and sole traders, with secure online access to their consolidated accounts and electronic billing information. They permit customers to view trends, analyze details of spend and take control of their communication services. The MDS e-billing and analytics solution empowers customers to make informed business decisions, enhances the loyalty and lifetime value of these important customers, provides additional value to attract new customers and retain existing ones, and reduces operational and support costs.

Utilizing a powerful analytics engine, MDS e-billing and analytics solution simplifies the task of integration with legacy billing and CRM systems; delivering rapid go-to-market, low-risk integration, accelerated time-to-value and lower total cost of ownership.

e-Billing and Analytics Solution



## Case Studies

# CUSTOMER SUCCESS STORY: SINGTEL OPTUS



Expert Billing For the Top-End of Town

SingTel Optus (Optus) needed to differentiate itself from its competitors and create a valuable service to attract and retain high-value customers. The company wanted to optimise its service to large corporate and government entities and therefore needed a billing and transaction management system to support that market segment.

#### STRATEGY

As the largest competitor to Australia's incumbent, Optus has taken a very strategic approach to winning high value customers.

Optus introduced superior customer-focused service to the market, along with premium product and service bundles. The corporate and government market in particular was requesting a better method to manage their communications portfolios.

To support this business decision, Optus selected Singleview as the strategic billing and transaction management system for their corporate and government customers. They chose Singleview because of its flexibility and functionality, which supports the concept of a "market of one".

#### RESULTS

Optus has reduced overall cost of ownership and improved operational efficiencies with lower bill processing cycle times and seamless internal operations, not to mention reduced spend on accessing data and increased time on servicing its corporate and government customers.

#### OPTUS – AN OVERVIEW

Optus, now owned by telecommunications giant SingTel, commenced operation in 1992 and is one of the largest communications service providers in Australia. It has more than six million customers today and provides a broad range of communications services including mobile, national and long distance services, local telephony, international telephony, business network services, internet and satellite services and subscription television.

#### ORGANIZATIONAL STRUCTURES REFLECTED WITH EASE

Singleview's hierarchies provide powerful aggregation features, which allow for the management of complex corporate and government accounts. The ability of Singleview to imitate these organizational structures is achieved via its superior and multifaceted hierarchies. Each account is treated individually, allowing billing, reporting and invoicing to be tailored to meet the client's individual business model. These hierarchies can sometimes be 8-9 levels deep with thousands of nodes.

#### BILLS AND REPORTS AS A SELLING TOOL

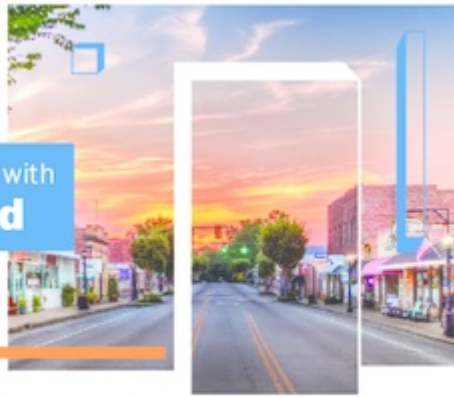
Optus is able to use the options provided by Singleview as a key differentiator for high value corporate clients. With Singleview, Optus customers have total control when they want it and how they want it.

- There are two key benefits for Optus customers:
- One single bill for all products and services.
  - Advanced multiple reporting functionality.





## Building the Future with **Broadband**



### Creating Communities

Communications service providers play a vital role in building rural America. Connecting unserved or under served communities through broadband technology improves their way of life and closes the digital divide by providing economic opportunities otherwise not possible.

CHR Solutions is a proven industry leader with over 75 years of experience and will help you invest in broadband. Our complete solution gives you the tools necessary to make strategic business decisions for building, marketing, and monetizing your network.

ENGINEERING SERVICES	BUSINESS SOFTWARE	BUSINESS CONSULTING
Network Planning & Design Broadband Viability and Feasibility Studies Outside Plant Engineering (Architecture, Field Notes, Design, Permitting) GIS/CAD Services Project/Construction Management Loan & Grant Assistance	Customer Management Billing Service Activation Sales & Marketing Order Capture Facilities Management Dashboards Case Management Financials	Regulatory Marketing Product Management Customer Service Billing CyberSecurity NOC Monitoring Invoice Fulfillment Systems Rollout

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From wireless to wireline networks, CHR has the insight and expertise that empowers the services connecting customers and communities. We stand ready to partner with you on all your project needs—from concept to construction. Whether you're deploying new networks or launching next-generation services, from funding to field services, CHR is with you every step of the way.

**CHR's Connected Services** provide the platform for next-gen networks and brings them to life. Our expertise in execution enables IP evolution—guaranteeing improved network reliability and scalability to support the services that maximize ARPU, reduce churn and generate new revenue while achieving regulatory requirements and reducing CAPEX.

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Your Success Starts Here

## Assuring Next Generation Backhaul Deployments with Performance Visibility

Lifecycle-Aware Performance Assurance Enhances Quality of Experience and Reduces OPEX/CAPEX

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**White Paper**  
**Telco Triple-Play Service Fulfillment**

Prepared by  
Alan Breznick  
Senior Analyst, *Heavy Reading*



[www.heavyreading.com](http://www.heavyreading.com)

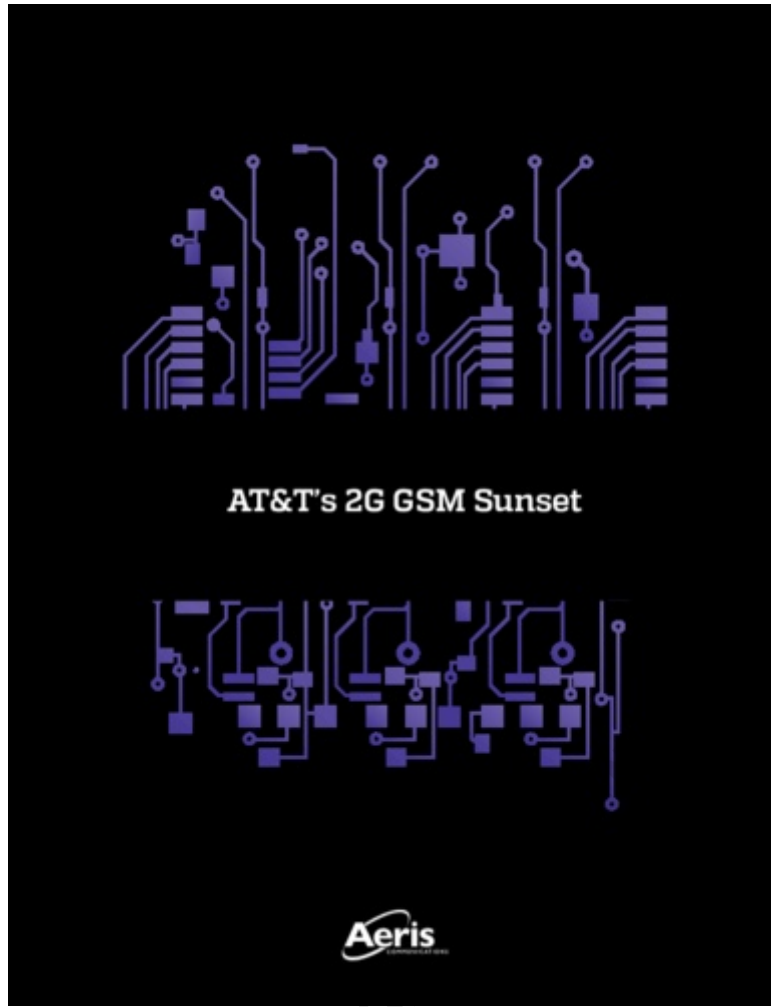
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December 2010

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AT&T's 2G GSM Sunset



The advertisement features a black background with stylized purple circuit board traces. The text "AT&T's 2G GSM Sunset" is centered in white. At the bottom, the Aeris logo is displayed in white.



IT'S TIME TO LOVE  
YOUR BILLING  
PROVIDER AGAIN.



cycle30  
we empower

The advertisement has a yellow background. On the left, a woman in a brown suit smiles, with two men in suits standing behind her. On the right, the text "IT'S TIME TO LOVE YOUR BILLING PROVIDER AGAIN." is written in bold black letters. Below this is the Cycle30 logo, which consists of a stylized infinity symbol above the text "cycle30" and the tagline "we empower" in a smaller font.



### The 2014 COMET Executive Summit

November 5 - 7, 2014 — San Diego, California

Follow event highlights on Twitter: #COMETSUMMIT

Pipeline continues its legacy of bringing together the world's leading service providers and technology innovators this fall at the 2014 COMET Executive Summit.

This exclusive event is gathering key executives from the world's leading operators with key technology developers and enterprises in an intimate symposium to explore the latest trends and challenges in communications and entertainment technology (COMET).

The COMET Executive Summit is a flexible, highly interactive format that is filled with unprecedented networking opportunities designed to build relationships that can be carried forward to solve the issues and challenges facing service providers and industry today.

Register today to stay on the edge of topics to be covered at the COMET Executive Summit, such as:

- Network security
- Big data & analytics
- Agile Architectures
- Network evolution & virtualization
- Customer experience management (CEM)
- Exploring cloud offerings
- Enabling new business models
- Delivering and assuring digital services
- Leveraging content

Attend CES 2014

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Register and book your accommodations today!

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Advanced IP Service Fulfillment  
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