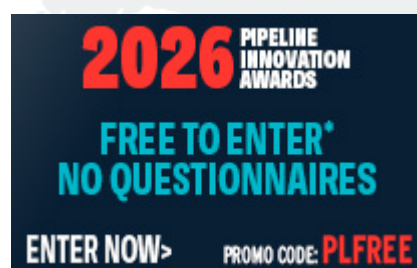


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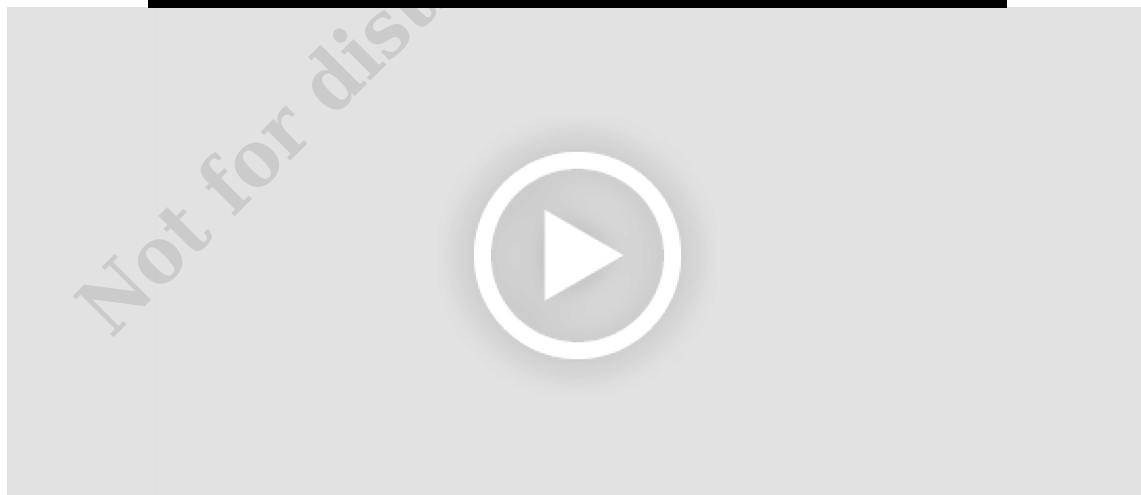
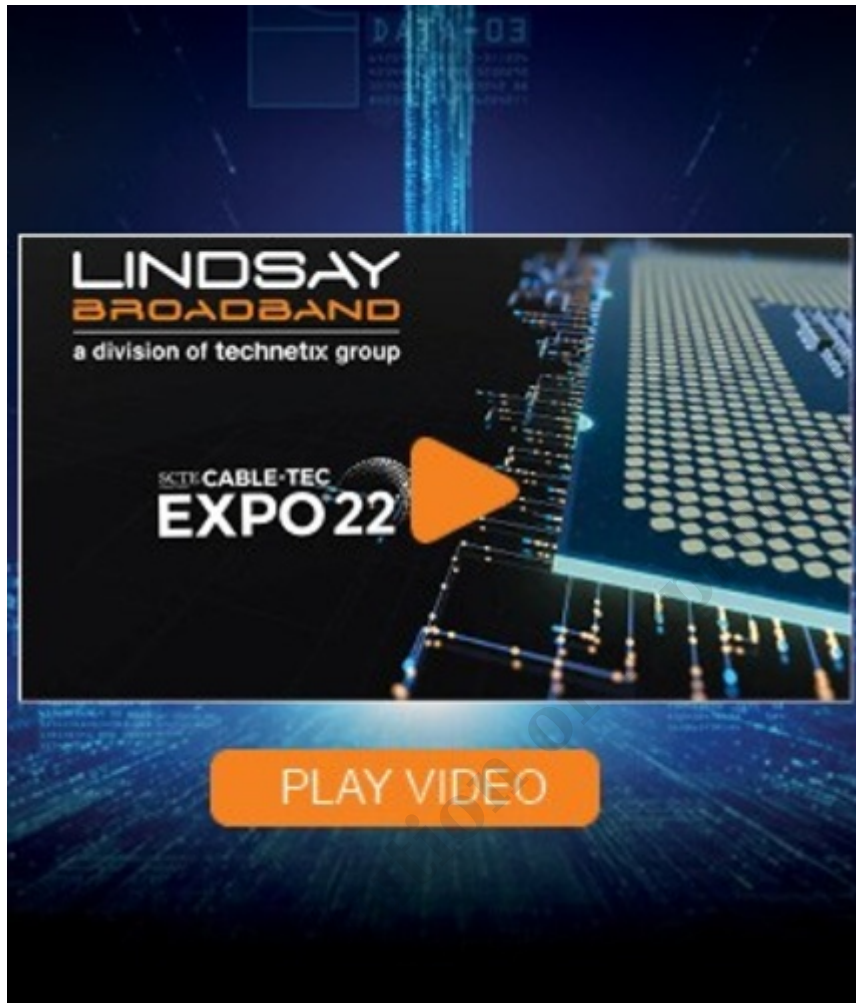
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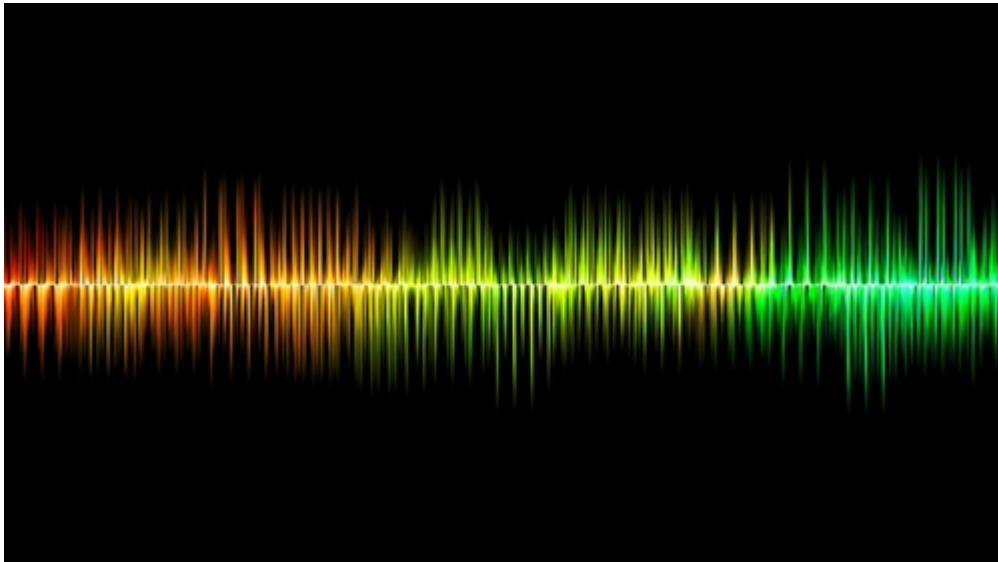
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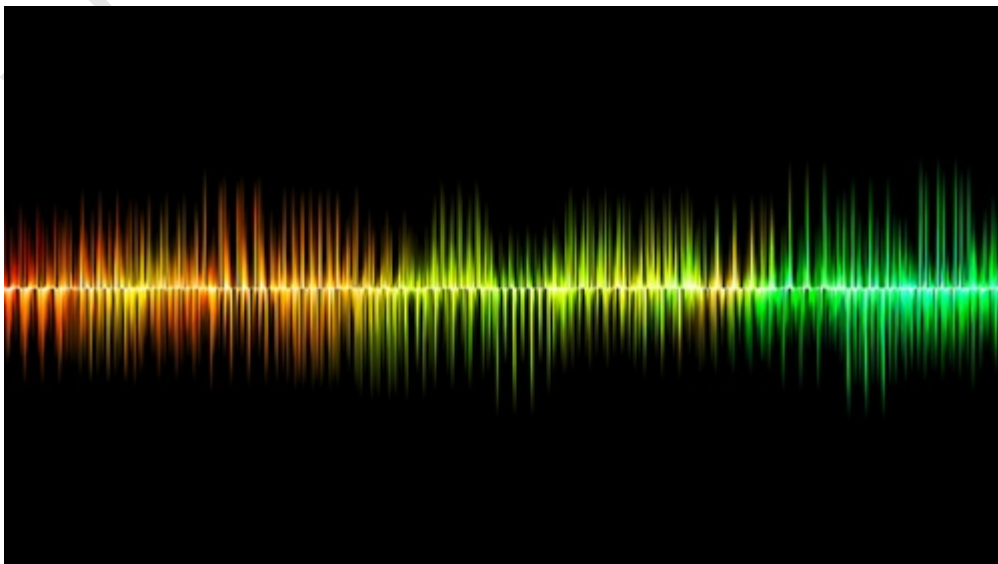
End-to-End Solutions for Broadband Networks

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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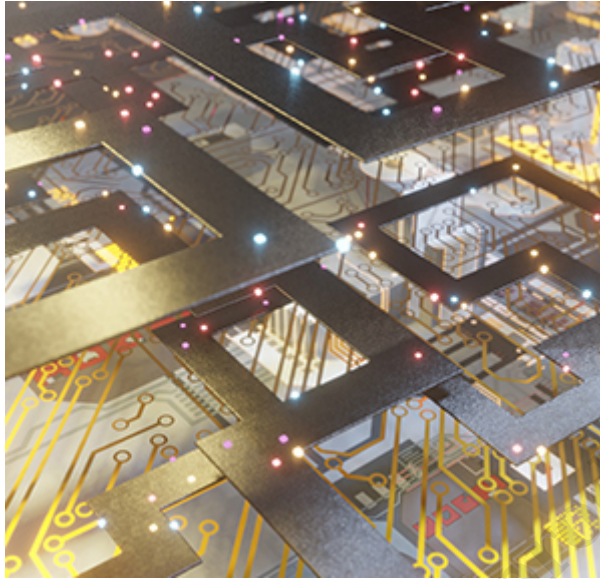
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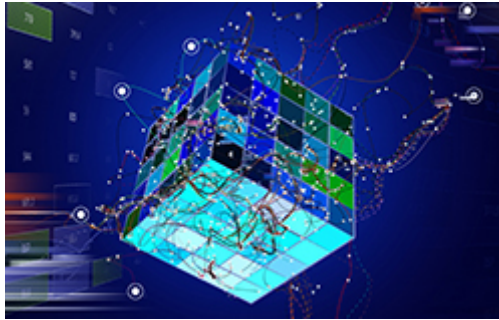
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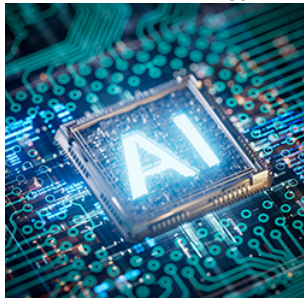
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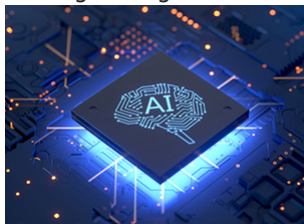
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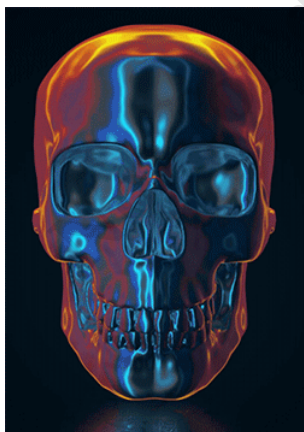
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TOP TEN PREDICTIONS FOR THE TELECOMMUNICATIONS INDUSTRY IN 2011

For B/OSS, Managing the Manager is #1, says Progress Software

Progress Software Corporation (NASDAQ: PRGS), a leading software provider that enables companies to be operationally responsive, predicts that telecommunications service providers will increasingly be able to detect technology problems that might affect customers, solving them before the customers even know they exist.

Sanjay Kumar, Industry Vice President for Communications and Media at Progress Software, said, "The telecommunications field is very competitive, and service providers have to do what they can to differentiate their offerings. Solving problems before they happen goes a long way toward managing the customer experience." The firm also predicts that mobile service providers will have to build stronger relationships with customers, mainly by providing unique offerings to grab and hold their attention.

Progress Software's Telecommunications predictions for 2011:

1. **For B/OSS, managing the manager is key.** Traditional business and operational support systems (B/OSS) will require systems to manage the systems. Most service providers have invested so much in their B/OSS infrastructure assets that they cannot be easily replaced and need an adapted layer to respond to real-time business demands and reenergize the existing B/OSS infrastructure's value.
2. **You will predict problems before they come to light.** Telco service providers will be able to predict when there is a potential issue that will affect customers—and correct it before it happens. The pre-emptive correction of problems before the customer knows they exist will become a key factor in differentiating service providers and improving the customer's level of service.
3. **Loyalty program.** Mobile service providers facing mounting competitive forces will have to build stronger relationships with their customers. They will need to provide customers with unique, interactive experiences to build stronger loyalty by tapping into customer call patterns and locations, correlating with customer preferences and providing value-added services to customize each customer's experience in a unique way.
4. **Partly cloudy.** As communication service providers head for the cloud, they will struggle with data interoperability between cloud and non-cloud environments. Operators will need advanced data transformation and adaptive technologies to take full advantage of cloud-based applications.
5. **Mind the gap.** Operators will be increasingly trapped in the gap between customer expectations for flexibility and speed, and the limitations in existing B/OSS infrastructure. This will drive demand for new business user toolsets to overlay B/OSS, enabling service providers to respond and deploy new solutions faster.

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Enterprise Customer Experience Transformation with
e-billing and e-care

MDS 2010 White Paper Series



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Going Global with M2M: What You Must Know to Control Costs

To launch a successful global M2M deployment, service providers and enterprise customers should first develop a plan that takes into account diverse cultures, languages, regulations, technologies and pricing. This Aerus White Paper outlines how differing regions and individual countries can create challenges in certification, support, and cost control and recommends actions to avoid these pitfalls.



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How to Succeed In Wireless Backhaul

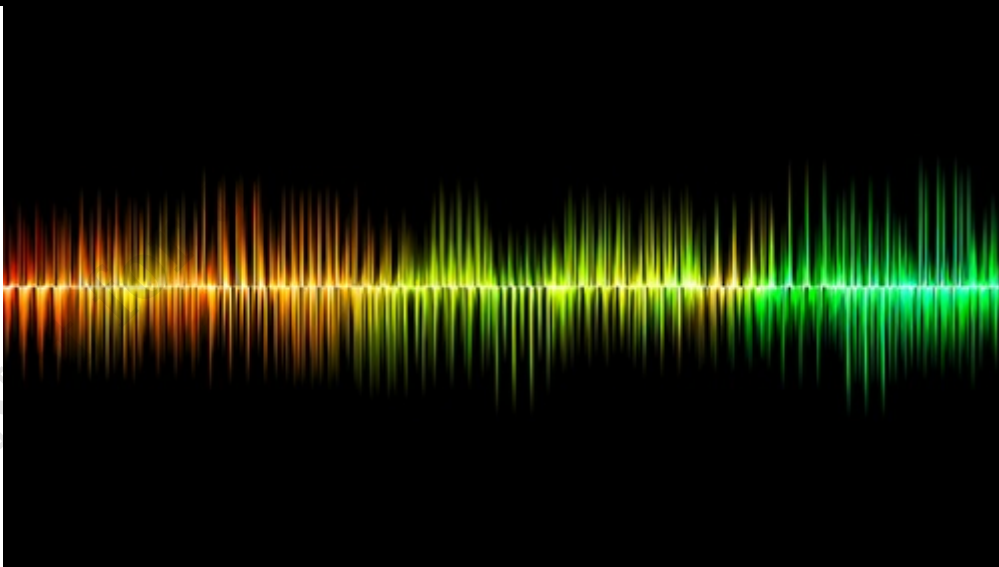
A Whitepaper: State of the Industry and Suggestions for Success
Joe Conn, Sr. Director of Wireless Engineering

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Dynamic Product Management for Communication Service
Providers (CSPs) – The Time is Now

A Stratecast Whitepaper





never underestimate the power of identity

hackers in an increasingly vulnerable digital world

Without question, 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 a lure, the risk 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 are properly entitled to access the information or assets involved. To minimize a problem further, applications are constantly trying to improve the user experience by reducing the friction in the authentication process. Unfortunately, making access 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. Scammers 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 busy name professionals and every-day consumers. Even the chief cybersecurity officer of the very organization vested with the responsibility to protect consumers by spotting, and preventing 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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Rethinking Communications to Improve Retention

Transitioning from campaigns to ongoing dialogues

WHITEPAPER
COMMUNICATIONS

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



Brochures

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.



Whitepapers

Embracing A Catalog Driven Social Network

By Faisal Ishaq
Principal Solutions Architect & Regional Sales Director
ConceptWave Software Inc.

WHITE PAPER

Brochures

MATRIXX SUBSCRIBER POLICY & CHARGING SYSTEM

MATRIXX Subscriber Policy & Charging System (SPCS) integrates the use of subscriber policies and preferences with sophisticated online charging to drive emerging business models to success in the Telco 2.0 era. It takes policy management and online charging to the next level by providing operators with a single, flexible way to control and charge for network traffic, combining it with subscriber preferences that both enforce fair usage and empower the subscriber to have visibility and control over their spending. This comprehensive view enables service providers to create new real-time relationships with their subscribers that are more personalized and profitable than those of today's market.

MATRIXX subscriber policies interact with customer pricing and products to provide a better level of visibility, more control and real-time service interaction for subscribers. By enabling them to set their own preferences, controls, notifications and spending limits, service providers can offer more personalization, better visibility, and highly differentiated products and services.

Personalization Drives Differentiation and Loyalty

In the era of instant information, twitter, 24 hour news channels, and almost ubiquitous Internet connectivity, subscribers expect the same visibility and access to information about their spending on communications services as they do on their credit card or iTunes account. As devices and applications grow in availability and capability, it becomes more critical that subscribers understand and control how and when they use services and what factors impact how they are charged for services. By providing subscribers the ability to set preferences on service access, spending limits, balance sharing, quality of service, and other factors, service providers can drive a more meaningful subscriber relationship resulting in stronger customer loyalty.

In many markets today, mobile penetration is approaching saturation. In some markets, penetration is more than 100% as subscribers own multiple devices. In this highly competitive climate, the only way to obtain a new customer is

to take one from your competitor. While exclusive or bleeding edge devices traditionally drove service provider differentiation, current economic conditions have resulted in consumers placing higher value on family plans, bundles, pricing, self-care and spend management features. A host of retailers are also flooding the market with low end offerings. The result is that traditional 'one size fits all' service offerings do not provide the level of differentiation required to attract and maintain subscribers.

With MATRIXX, subscribers can choose to set spending controls, policies and preferences to personalize their offer and drive a more subscriber-oriented experience. They can set spending limits and notifications at the service level such as setting a higher level of spending for email than for Web browsing. Subscribers can limit access to specific services or limit usage to certain hours of the day. They can also set policies on how balances are shared among devices or family members.

Additionally, service providers can set policies that impact service usage or pricing to enforce fair usage, reward their best customers, or encourage subscribers to use high bandwidth services when network traffic volumes are low. Information about credit score, historical spending, or customer status can influence how services are priced and charged for.

Brochures

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WHITE PAPER

FAST ANALYTICS OVER SLOW DATA



PTP Test Applications

Hamadoun Dicks, Product Specialist, Transport & Datacom Business Unit

4G/LTE deployments and increased bandwidth requirements in Carrier Ethernet services are the driving force behind the new backhaul network technology. Synchronization is required for cellular and wireless network operations because base stations must be synchronized in order to hand off calls between base stations, minimize dropped calls and ensure proper billing. Since precision time protocol (PTP) provides both phase and frequency, it is quickly becoming the synchronization technology of choice for packet networks.

WHAT IS IEEE 1588V2/PTP?

PTP provides high clock accuracy in a packet network by continuously exchanging packets with appropriate timestamps. In this protocol, a highly precise clock source, referred to as the grandmaster clock, generates timestamp announcements. It also responds to timestamp requests from boundary clocks, thus ensuring that the boundary clocks and the slave clocks are precisely synchronized with the grandmaster clocks. By relying on the holdover capability, the precision of the integrated clocks and the continuous exchange of timestamps between PTP-enabled devices, the frequency and phase accuracy can be maintained within a sub-microsecond range, thus ensuring synchronization throughout the network.

The objective of PTP deployment is simple: by exchanging timestamps, the slave clock can determine its offset from the grandmaster clock and thus adjust itself. This provides frequency and phase synchronization through packet distribution.



Figure 1. PTP network

PTP USE CASES

PTP is a packet-based technology. As the synchronization packets used by PTP are forwarded throughout the network between the grandmaster and hosts, they are subject to delay (latency), delay variation (packet jitter) and frame loss. Despite applying high priority to synchronization flows, synchronization packets will still experience congestion as well as routing and forwarding issues (e.g., out-of-sequence packets and route flaps). The host clock's holdover circuit must be stable enough to maintain synchronization in the event that synchronization packets experience these network events.

In addition to testing packet metrics to make sure they meet the service level agreement (SLA), in some cases, it may also be critical to validate the frequency measurements of the sync signal. A few use cases are detailed herein. Table 1 summarizes the different synchronization testing applications.

Service Turn-Up	When	Who	Tests	Duration	Product
Ethernet backhaul and PTP client turn-up	Performed every time a tower is put to service	Field technician	- EtherSAM (Y1564) - PTP GL measurements - Client emulation	30 minutes at 1 hour	NetBlazer Series
Sync network installation	Performed when a sync network is being deployed or when a new grandmaster is added	Network engineer	- Wander measurements - PTP GL offset - Slave/client emulation	24 to 48 hours	SyncWatch-ITD
Troubleshooting					
Basic troubleshooting	Packet metrics issues/defective slave client	Field technician	- EtherSAM (Y1564) - PTP GL measurements - Client emulation		NetBlazer Series
Advanced troubleshooting	Incorrect clock output/defective grandmaster	Network engineer	- DE, MTE - PTP GL offset - Slave/client emulation		SyncWatch-ITD

Table 1. Synchronization applications

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Knowledge Call Webinar (includes the pipeline live and pre-recorded webinars on the topic of our choice, including live, and pre-recorded for all those that want to participate in our webinars)	10-15 per year	10-25 per year	10-40 per year	10-100
Pipeline Executive Summit Sponsorship (includes providing the executive panel in the Pipeline Executive Summit and Pipeline Executive Summit, including access to all our members' contact information for the duration of the summit)	10-15 per year	10-25 per year	10-40 per year	10-100
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DATA VALIDATION & QA

The Enghouse Data Services team offers specialized tools that enable validation of source data before conversion to the target. These specialized tools can highlight problem areas that need to be corrected (e.g. data integrity rules) that might be broken by migrating to the target system.



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Leveraging Microsoft Dynamics® CRM, Omnia360 best-of-breed software platform delivers a comprehensive, turn-key back-office solution for CSPs to monetize new untapped revenue opportunities.

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Dynamic Product Catalog

Omnia360 delivers a dynamic, centralized product catalog enabling the selling and fulfillment of next-generation products and services, such as cloud services, productivity solutions, unified communications, and Voice over IP products — all while enabling traditional voice, video, and data products. This unlimited product flexibility capability helps optimize sales accuracy while reducing the time it takes to complete the entire concept-to-cash cycle.

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W²CM Smart Replay

Near-Sanad, 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 revenue-sharing 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).

EXFO

Testing the Cloud

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INTRODUCTION

Broadband, backbone and mobile wireless service providers see the cloud as an opportunity for growth. New applications running in the cloud drive new traffic to their network. The cloud also offers new revenues from new services that can be sold to customers. The business models for carriers and how they relate to the cloud are evolving quickly, but one fact is becoming clear: to achieve success in the cloud market, carriers must actively ensure that they offer a high quality of service to cloud consumers. The best way to assess cloud quality is to test the cloud.

A cloud is a shared computing platform available over the network used to run a variety of business or personal applications. The concept is hardly new; it has roots in service bureaus, outsourced data centers and utility computing. What makes the cloud work today is the rise of the web browser as a thin client that allows individual users to run any application, the wide availability of high-bandwidth networks, and virtualization technologies for computers, storage and networking. The cost savings, expanded reach, and improved quality gained by running an application in the cloud is proving to be a business success, as shown by the growth of cloud services into a market worth billions.



Figure 1. Cloud players: cloud users, cloud consumers, cloud providers and cloud carriers

Cloud services are sold to cloud consumers who have a business need. To meet that need, the cloud consumer deploys an application to be run in the cloud for a user community. The cloud itself is driven by cloud data centers that provide an environment for running the application. The data centers provide servers, storage and

networking. User access to the cloud data centers is provided by cloud carriers. The cloud provider manages the cloud data centers and their servers, storage and networking. The carrier manages the interconnection between the user and the cloud data centers. The application may be owned and managed by the cloud consumer or the cloud provider.

The quality of the user's experience depends on both the carrier and the cloud provider. Together, they determine how well the application serves its users. The carrier manages bandwidth, latency, reachability, loss and other network key performance indicators (KPIs) that affect quality. The cloud provider manages processes or utilization, storage, availability, data delivery times, and other KPIs that are tied more directly to the service used to cloud consumers. These service-level quality indicators (SLQs) are not necessarily tied together or determined by the business relationship between them. If they are independent, cloud carriers offer SLAs guarantees to cloud consumers. Cloud providers in turn offer SLAs to cloud consumers. If the carrier owns the cloud provider, then the single organization can offer end-to-end service-level agreements. SLAs are a key factor driving service providers to test the cloud.

Actor	Definition
Cloud User	A person or organization that uses and benefits from the cloud.
Cloud Consumer	An organization or person that buys services from the cloud provider to use or run an application.
Cloud Provider	A person or organization that provides a cloud service.
Cloud Center	A communications service provider that provides connectivity and transport between users and the cloud.

Palatka, B. (1999) Interview with author.

In this complex business environment, carriers have struggles. First, they own the network that connects users to the application running in the cloud. Second, they provide the circuits that connect cloud data centers to the Internet and each other. Third, they can provide the security and privacy customers want through dedicated circuits or virtual private networks that isolate one customer's traffic from another's. Finally, they know how to offer a high-quality service backed by the guarantees of an SLA.

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