



CSG INTERMEDIATE

**THE AGILE MEDIATION
PLATFORM FROM CSG**



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With over 200 global installations, CSG Intermediate is one of the most trusted offline and online mediation solutions in the world. Intermediate captures and processes customer usage events of all kinds from any service delivery network for industry leaders in telecom, finance, logistics, and government. Our largest customers process over 76 billion billing mediation events a day.

CSG Intermediate can invigorate your current business and bring you the most value when adapting to new technologies, devices and services. With unprecedented expertise in managing the transition to new networks, we'll help minimize costs and streamline internal processes with a single strategic mediation platform for all network technologies and services.



NEXT-GENERATION NETWORKS NEED NEXT-GENERATION MEDIATION

IT ALL STARTS WITH THE NETWORK...

Agility. Speed. Quality. These attributes are among the most valued characteristics by users of any communications service. CSPs around the globe are responding in kind with investment in network upgrades. Hundreds of wireless service providers are in the midst of VoLTE deployments; terrestrial and submarine fiber rollouts are being accelerated in no small part due to increasing government investment in national broadband networks; and cable operators worldwide are upgrading to the next generation speeds with national digital upgrades or the adoption of DOCSIS3.1. All of these investments are required to enable the next-generation services that consumers demand.

Simultaneously, we see the development of next-generation services driving new business models across industries such as cloud services and Internet of Things (IoT) services. And these new services, combined with the explosion of digital content, generate data records in volumes orders of magnitude greater than the past. Each of these developments—network evolution, cloud services, Internet of Things and big data—are transformative in and of themselves. Collectively, they're altering the industry beyond network technology, and affecting analytics and data management, service delivery, charging, billing and more.

...BUT IT ENDS WITH THE CUSTOMER

The provision of next-generation network technologies is table stakes for the service provider. They must seize emerging opportunities, grasp and retain market share in increasingly competitive environments, and rapidly deploy new services. Monetization of new services is a mandate to recover the huge investments being made. But, monetization is different in the new world of all digital, high-speed networks connecting things more than users. It is less about associating value at the individual transaction level, and more about deriving insights and value at the collective level. These insights allow CSP to see more deeply into individual customer behavior, market trends, and partner performance, which results in process efficiencies and margin growth. The greatest understandings are derived from the most timely, accurate and complete set of transactional data. While a single record may not have a charge, its value is as part of the collective and must be collected, processed and stored with as much attention and efficiency as ever before.



NEW BUSINESS MODELS

INTERNET OF THINGS (IOT): WHAT DOES IT MEAN?

In its simplest definition, IoT is the connection of devices that communicate with each other and a command system without human intervention. Recently, there's been an upsurge in the overall number of connections, vast diversity of devices, applications such as eHealth, smart meters, inventory management, and connected vehicles. The result is new kinds of transaction data generated by these automated connections.

IoT technology offers infinite possibilities across many industries. It's a network of sensors collecting various data attributes (temperature, inventory, vital statistics, etc.) surrounding us in our daily lives, engaging in relentless, semi-autonomous digital interactions.

All of this makes IoT exciting and perplexing. IoT connectivity revenues will continue to grow robustly. But the choice for CSPs is whether they want to tap into other revenue streams, or if connectivity offers sustainable profitability. CSPs are playing multiple roles in the IoT market—they act as consultants, integrators, platform developers, device testers, channel partners as well as IoT service providers.

IoT poses challenges for CSPs in terms of how to efficiently manage non-human connections (whose numbers are potentially orders of magnitude higher than today's connections). It may be that these automated services will generate massive volumes of low to no-value network transactions.

IoT connectivity also brings advanced communications to industry segments such as transportation, healthcare, and utilities, which opens new business opportunities for them. It represents an opportunity for operators to deliver communications

expertise in broad areas including strategy, field service management, networking, monitoring and maintenance. The CSPs who adapt their business to this impending windfall will be best-suited to reap the highest rewards.

WHY CLOUD, AND WHY NOW?

Cloud computing has been available for some time. Only recently has it gained critical mass. One of the main growth drivers in cloud adoption is the desire to access information through multiple devices. Another of the biggest drivers for cloud adoption is use by small and medium businesses (SMBs); this is where the momentum will be unstoppable. A market potentially worth \$240 billion, 60 percent of enterprises reported that cloud computing is the highest priority in their IT departments. And those IT departments are likely to already be your customers, enabling you to easily expand your business with them.

GARTNER PREDICTS THAT THE NUMBER OF IOT CONNECTED DEVICES WORLDWIDE WILL NEARLY DOUBLE BY 2020, FROM 11.2 BILLION TO 20.4 BILLION.

WHAT MAKES BIG DATA BIG?

Big data has been characterized by growing data record volumes, velocity (need to collect and process with increasing speed) and variety. It is not only the proliferation of IoT devices and the expansion of cloud services that will generate big volumes of data, but the overall growth in consumption of digital content. Through the provision of these services, CSPs have access to an extraordinary amount of data and must harness it to improve customer experiences, enterprise-wide business operations and profitability. Those operators who collect, manage and apply the insights of this vast data will achieve market leadership.

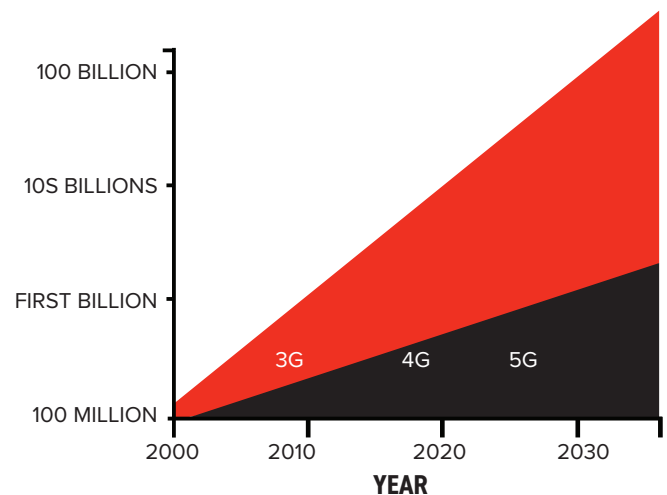
AGILITY AND REVENUE MANAGEMENT FOR NEXT-GENERATION, IOT AND CLOUD

Service providers will benefit from these developments on multiple fronts. They gain by providing higher bandwidth connectivity and delivering digital services that customers demand. That means they can support a greater number of devices and connections across a growing number of industry use cases, and extend their traditional connectivity-based offer to be an enabler for and provider of bundled cloud solutions. CSPs possess a unique advantage to provide cloud computing because of their technical credibility, command of the network, position of trust, and preexisting relationships with large and small enterprises.

Technology introductions are faster, product lifecycles are shorter, and mass adoption has accelerated. CSPs need to be more agile to take advantage of new opportunities, more diligent to optimize revenue and employ effectual business models to pull it all together.

At the CSP's heart, a flexible BSS solution can be a revenue driver by improving business elasticity to adapt to new technologies, applications, devices and usage paradigms. In a challenging economic climate, there is an even greater focus on managing costs, but there is also opportunity and growth. Fast-moving operators have a distinct competitive advantage to win early market share. But these advantages come with data mediation challenges:

- **Revenue Opportunities**—capitalizing on new opportunities arising from launching new services more quickly than competitors
- **Revenue Leakage**—ensuring seamless integration among mediation platforms, network elements and varied service types to eliminate redundancy (systems and processes) and revenue loss
- **Manage and Reduce Costs**—predictably managing the initial costs of supporting new networks and services, while streamlining the operational costs of co-existing legacy networks





TRANSACTIONAL MODEL USE CASE

Telecom is a demanding market—characterized by high-volume transaction processing requirements from many sources (network types) for myriad services. Leading companies in vertical markets beyond telecom are looking to telecom systems to meet their transaction-centric business models.

One of the world's leading transaction processors and payments companies relies on CSG technology to provide the reliability, speed, and agility that are fundamental to its business strategy.

CSG Intermediate handles the daily collection of transaction records from across its payment network for correlation, duplicate checking, enrichment and the generation of billing events. After just the first six months of live production, the system had processed more than 10 trillion transactions.

The financial services company didn't choose CSG Intermediate to simply replicate its previous processing capabilities; instead, it selected a flexible platform to enable its current and future business strategy—faster and at a lower cost.

And in an industry charged with keeping track of every penny, Intermediate's robust error management capabilities help prevent revenue leakage as well as identify individual events and their sources that need correction.

The more that things change—network evolution, business model shifts, transaction volume explosion—the more you'll benefit from using the CSG Mediation platform. We support an extensive range of network technologies and have integrated LTE, IMS and NFV from the earliest deployments.

The largest and fastest growing operators in the world rely on CSG to consolidate and replace their multiple legacy mediation systems to support the latest network technologies, like NFV and the evolution to 5G, in parallel with existing circuit-switched services.

CSG Intermediate can invigorate your current business and bring you the most value adapting to new technologies, devices and services. With unprecedented expertise in managing the transition to new networks, we'll help minimize costs and streamline internal processes with a single strategic mediation platform for all network technologies and services. Intermediate supports the networks and devices prevalent today, and is extensible to support those yet to be introduced.

ONE OF THE WORLD'S LEADING TRANSACTION PROCESSORS AND PAYMENTS COMPANIES RELIES ON CSG TECHNOLOGY TO PROVIDE THE RELIABILITY, SPEED, AND AGILITY THAT ARE FUNDAMENTAL TO ITS BUSINESS STRATEGY.



INTERMEDIATE PRODUCT OVERVIEW

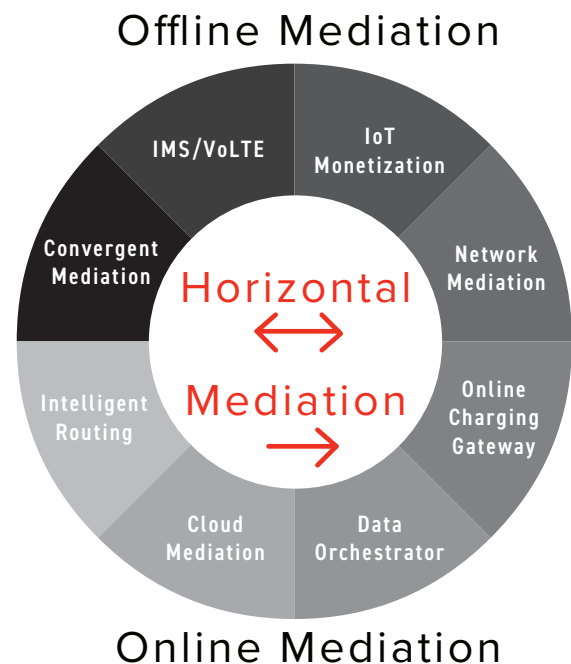
With over 200 global installations, CSG Intermediate is one of the most trusted offline and online mediation solutions in the world. Today we process well over 76 billion events per day for our top ten clients. Intermediate captures and processes customer usage events of all kinds from any service delivery network for industry leaders in telecom, finance, logistics, and government.

CSG Intermediate offers a cost-effective way to:

- Reliably process vast transaction volumes regardless of network or usage type
- Quickly implement new business requirements
- Meet/exceed internal and external auditing requirements
- Consistently lower total cost of ownership and deliver a fast ROI

Intermediate's adaptive feature set and proven scalability make it a smart, consolidated solution that delivers long-term value and ROI. By combining comprehensive functionality for both online and offline mediation, Intermediate is uniquely positioned to provide 'horizontal mediation' for any event or service type from any source.

With rapid implementation times, flexible deployment options including as a service or in the cloud, and supported by lowest cost commodity hardware, Intermediate can accelerate your time to monetizing your next-generation networks and services.





COLT ENABLES IMS VOIP WITH INTERMEDIATE

INTERMEDIATE FULFILLS THE FUNCTION OF 3GPP OFFLINE CHARGING FUNCTION (OFCS) AND SUPPORTS THE DEPLOYMENT OF VIRTUAL COLLECTION FUNCTIONS (VOFCS) UNDER NFV FOR COMMUNICATION, SERVICE AND NETWORK PROVIDERS.

Colt is a multinational telecommunications, IT-managed services, and data center services company. They provide services to city-based large enterprises, midsize businesses and wholesale carriers in 28 countries across Europe, Asia and in the United States.

Colt operates a 187,000km LDN, metro fiber, subsea and terrestrial leased capacity network that includes 49 major metropolitan area networks worldwide, with direct fiber connections into 25,600 buildings and over 850 Colt and third-party data centers.

Colt required Offline Charging to support IMS-based VoIP services, and to offer advanced services such as voice with streaming video, multi-user conferencing sessions and unified communications. All this was needed while reducing the impact on downstream billing systems.

CSG SOLUTION

- Colt selected Intermediate for Offline Charging for IMS services
- Resolved IMS mediation challenges including new network interfaces (IMS Media Gateway Function), new services (e.g. SIP trunking for end user VoIP)

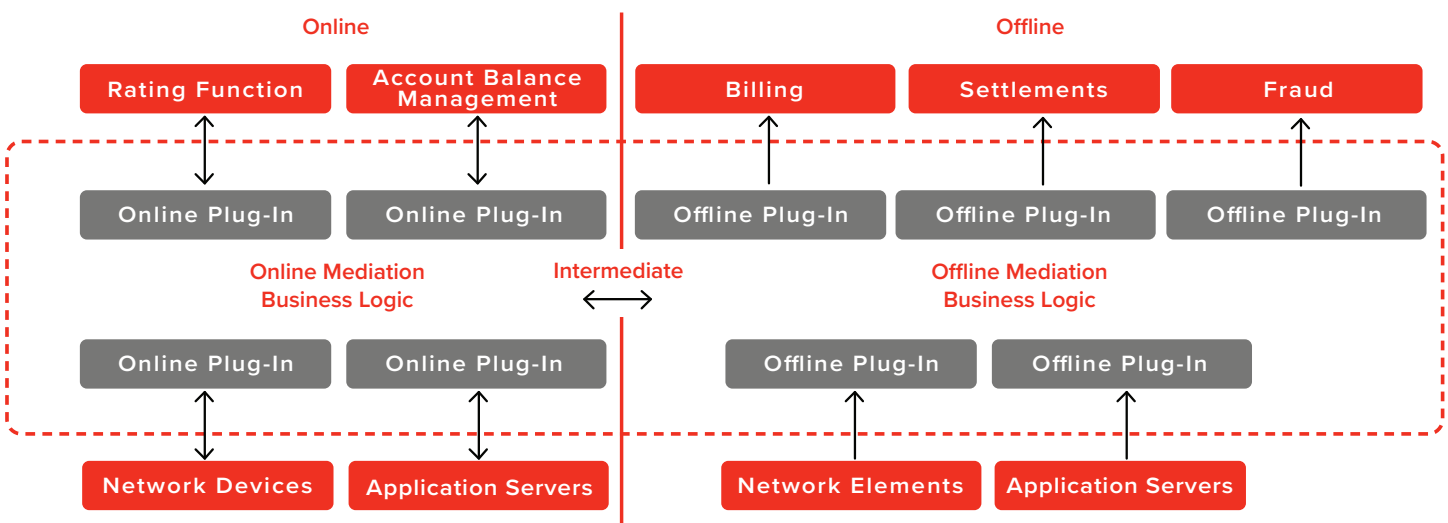
BENEFITS RECEIVED

- Enabled the transformation from pan-European TDM network each with unique billing stack to a cohesive charging platform for IMS streamlined operations
- Unified mediation business logic for IMS reducing the time to market and lowering development costs for new products
- Emulating TDM behaviors for legacy services that enabled consistent reporting and utilization measurement for customers



INTERMEDIATE FEATURES

- Consolidated platform—Intermediate combines horizontal—offline and online—and convergent—wireline, wireless, 3G, 4G—mediation onto a single platform to deliver:
 - Unparalleled performance—exceeds transaction throughput of legacy systems by a factor of ten, so it requires less hardware
 - Ultra-low latency—attain low average transaction latencies on cost-effective commodity hardware
 - No third party products—eliminates the need for expensive commercial databases or in-memory caching software
 - Proven low-cost, high availability—highly reliable architecture, supporting HA across bare metal, virtual and cloud platforms
- Seamless plug-in integration—easily configure mediation portals with off-the-shelf support for network functions and business systems
- Fast configuration—drag-and-drop plan management for configuring online and offline mediation workflows
- Flexible business logic—quickly implement mediation rules for transaction validation, correlation, de-duplication filtering and routing rules with powerful scripting
- Centralized operations—manage and monitor distributed mediation nodes in a single dashboard





INTERMEDIATE BENEFITS

BUSINESS ELASTICITY

Intermediate provides the basis for an agile BSS platform, designed to integrate with diverse network elements, support a multitude of usage records and adapt to evolving revenue models.

UNPARALLELED APPLICATION PERFORMANCE

Intermediate provides cost-effective scalability and the raw power to exceed the demands caused by an upsurge in data volume, variety and velocity requirements.

REVENUE ASSURANCE

Proven to protect revenue as networks evolve and volumes magnify—eliminating gaps among networks and supporting systems.

LOWER TOTAL COST OF OWNERSHIP

Integrated online and offline mediation and consolidating multiple legacy systems leads to lower operating costs.

ACCELERATED TIME TO MARKET AND ROI

Unique configuration and testing tools to enable fast time to market for new services and agile integration with plugin support for new network elements.

PROVEN MEDIATION SOLUTIONS

Business is uncertain, but Intermediate instills confidence as it is a carrier-grade solution that has excelled and surpassed the competition in the most demanding network operations.

INDUSTRIAL STRENGTH

With over 35 years of experience, CSG has established technical credibility and industry

expertise while accumulating impressive performance statistics. CSG created its Billionaire Club to recognize the outstanding accomplishments of its customers; the largest telecoms customers process over 27 trillion mediation events a year. The following are highlights of Intermediate deployments:

- Proven to capture and process customer usage events of all kinds from any service delivery network
- CSG's ten largest customers support over 620 million subscribers
- Largest Intermediate deployment supports over 89 million subscribers in a single instance
- Complex deployment integrated with over a thousand network elements and devices

MEETING TOMORROW'S CHALLENGES TODAY

CSG customers around the globe have already witnessed a huge increase in charging event volumes generated by the explosion of mobile broadband services, the rollout of 5G, the provision of cloud services and the adoption of IoT use cases. CSG Intermediate keeps pace with the transaction volume growth of some of the world's largest operators today, in a cost effective manner and with the flexibility to enable what comes next.



OPERATOR TRANSFORMS BSS WITH INTERMEDIATE

When an operator decided to overhaul their entire business the BSS IT infrastructure was a critical part. To support this transformation, they turned to CSG—a long-term trusted partner. With CSG, the operator re-engineered their BSS from the ground up, deploying modules of Singleview, Total Service Mediation and Wholesale Business Management Solution.

As part of the transformation, CSG Intermediate and the Active Mediation Manager (AMM) perform intelligent routing of requests between the network and real-time charging systems. This approach not only simplifies their architecture, but also reduces OCS integration costs, adds charging intelligence between the network and business systems and ensures faster time-to-market for new networks and services—all delivered in just seven months.

THE SOLUTION PROVIDES INTELLIGENT CHARGING OF SMS, DATA, CONTENT AND VALUE-ADDED SERVICES, AND ENABLES THE OPERATOR'S TRANSFORMATION FROM A LEGACY IN TO A NEW CSG OCS BY SELECTIVELY ROUTING NETWORK TRAFFIC TO EITHER PLATFORM. WHAT WAS A LOW-COST OPTION FOR THE TRANSITION STAGE HAS BECOME A PERMANENT NETWORK MEDIATION LAYER DELIVERING HIGH SPEED ROUTING AND MORE.



ABOUT CSG

CSG simplifies the complexity of business transformation in the digital age for the most respected communications, media and entertainment service providers worldwide. With over 35 years of experience, CSG delivers revenue management, customer experience and digital monetization solutions for every stage of the customer lifecycle. The company is the trusted partner driving digital transformation for leading global brands, including Arrow, AT&T, Bharti Airtel, Charter Communications, Comcast, DISH, Eastlink, iFlix, MTN, TalkTalk, Telefonica, Telstra and Verizon.

At CSG, we have one vision: flexible, seamless, limitless communications, information and content services for everyone. For more information, visit our website at csgi.com and follow us on [LinkedIn](#), [Twitter](#) and [Facebook](#).