



CSG 5G DYNAMIC CHARGING FUNCTION

Ensure a seamless transition to 5G networks and services

5G—NEW TECHNOLOGIES & STANDARDS

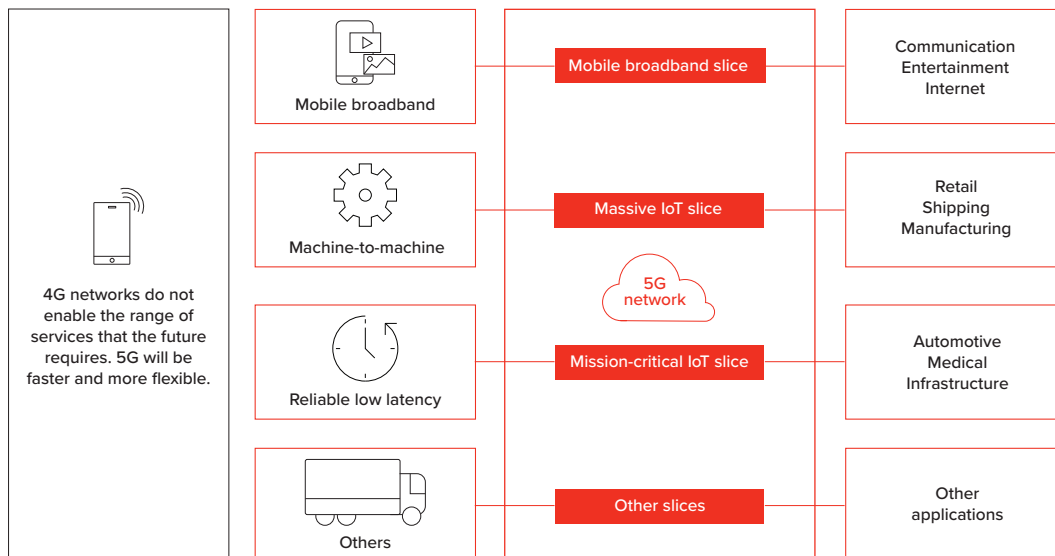
5G is becoming a reality with global deployments already underway. 5G will deliver speeds up to 1,000 times faster than 4G, as well as much lower latency and the ability to support huge numbers of devices connecting to the network simultaneously. Not only will 5G deliver benefits to the consumer in terms of increased speed, but it will unlock the full potential of the Internet of Things (IoT) and support the vast array of connected devices that will be prevalent.

In order to deliver on these ambitious goals, 5G networks and mediation systems will be fundamentally different from their predecessors in a several ways and will be underpinned by a number of key technologies.

→ **Virtualization**—5G networks and mediation systems will run in virtualized cloud environments, following cloud-native principles and standards to deliver auto-scaling and fault tolerance

5G NETWORK SLICING

5G NETWORK SLICING ENABLES SERVICE PROVIDERS TO BUILD VIRTUAL END-TO-END NETWORKS TAILORED TO APPLICATION REQUIREMENTS



IoT: Internet of Things

Source: ITU News



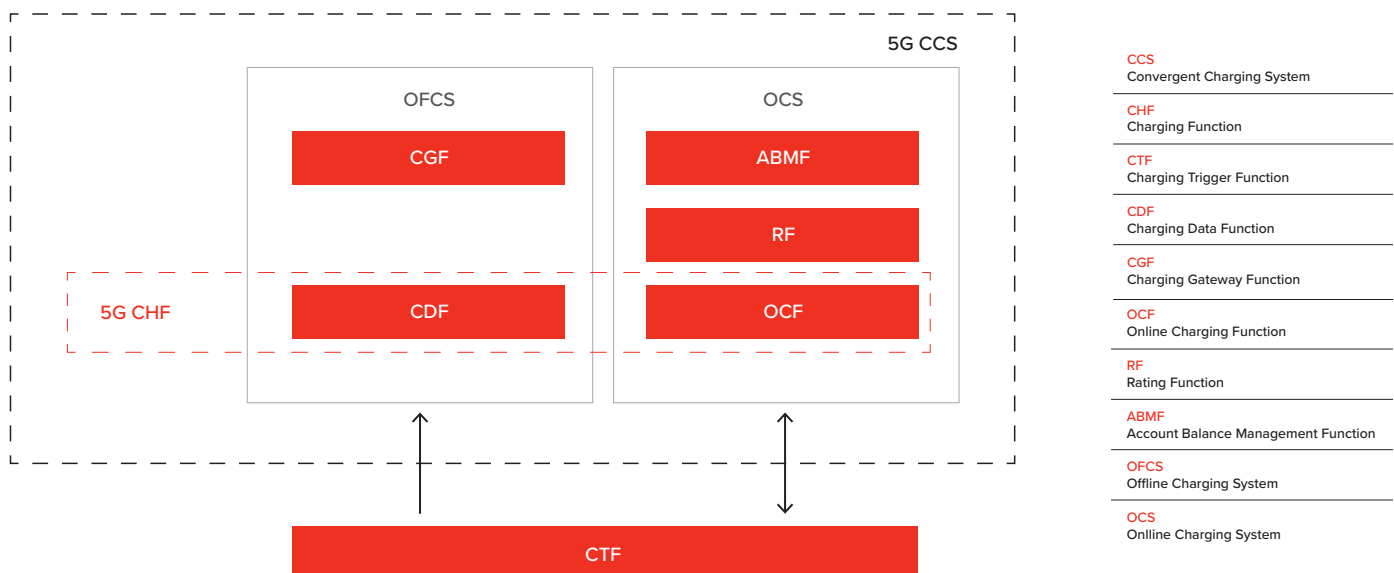
- **Network Slicing**—5G will enable network operators to provide portions of their networks for specific customer use cases such as mobile broadband, smart energy grid, connected vehicles and smart cities. Each use case receives a unique set of optimized resources and network topology with SLA-specified properties such as connectivity, speed, and capacity that suit the needs of that use case. Network slicing allows the creation of multiple virtual networks on top of a shared physical infrastructure, unlike 4G, in which all services and use cases share the same infrastructure
- **Microservices**—In order to deliver the ultra-low latency and self-healing required to support 5G, network and charging components that were previously centralized will be moved closer to the network edge in a distributed fashion. There will be a move away from a small number of large central monolithic application instances to multiple smaller, streamlined components optimized for carrying out specific tasks where they are required

In order to effectively monetize 5G networks, mediation systems will have to be aligned with these technologies and support the same operating modes.

EVOLVING 5G MEDIATION & CHARGING STANDARDS

The 3GPP standards for mediation and charging in 5G differ from previous iterations in a number of ways:

- The 4G Offline Charging System (OFCS) and Online Charging System (OCS) are consolidated into a single logical entity called the Convergent Charging System (CCS)
- The offline CDR generation capabilities provided by the Charging Data Function (CDF) and online charging event management provided by the Online Charging Function (OCF) are consolidated into a single logical entity called the Charging Function (CHF)
- The 4G Diameter interfaces between the Charging Trigger Function (CTF) and the CHF are implemented using a new Service Based Interface for 5G, based on JSON/HTTP2



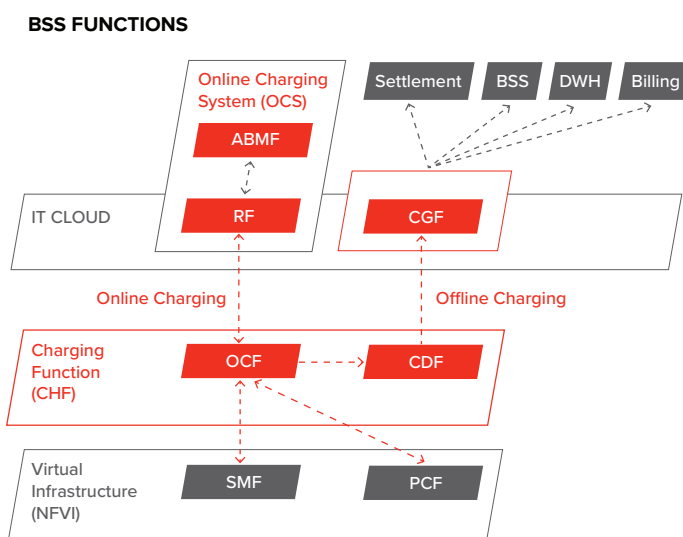


CSG 5G DYNAMIC CHARGING FUNCTION

CSG 5G Dynamic Charging Function provides a cost-effective and efficient way for service providers to seize the 5G opportunity with minimal risk and disruption to existing systems.

CSG 5G Dynamic Charging Function fulfills the roles of both the CHF and CGF, providing offline and online mediation functionality in a single platform and handling the complexity of all the interfaces between the network and the BSS functions.

At a minimum, 5G will require a new or upgraded CHF capability as the interface to the network components which was previously Diameter is now based on JSON/HTTP2. In cases where the existing Online Charging System (OCS) is being preserved and reused for 5G, CSG's CHF solution provides a fast time to market for 5G services by front ending the existing OCS and handling the new JSON/HTTP2 interfaces to the 5G network components, as well as providing the Charging Gateway Function as shown in the diagram below.



BENEFITS OF CSG 5G DYNAMIC CHARGING FUNCTION

- **Vendor-Independent**—Support network equipment and OSS/BSS systems from any vendor. Standards based interfaces with the added ability to configure proprietary protocols and message formats means that the solution is capable of communicating with virtually any type of equipment and systems
- **Preserve Existing BSS Investments**—Existing charging interfaces that are based on Diameter will need to be upgraded to support JSON/HTTP2. A quicker and more cost-effective option would be to use CSG 5G Dynamic Charging Function to handle the conversion from JSON/HTTP2 to Diameter, thereby enabling the existing online charging system and interfaces to stay in place
- **Shield Charging Systems from 5G Volumes**—The rapid increase in charging transactions resulting from 5G use cases such as IoT will result in a potentially spiraling volume of traffic directed towards the online charging system. Many of these transactions will either be zero-rated or included in subscription bundles, and so they do not need to be reach the online charging system. By front-ending the online charging system with CSG 5G Dynamic Charging Function, service providers can effectively offload a large proportion of the charging transactions and process them locally; thereby only sending transactions that require rating/balance updates to the online charging system. By reducing the volumes of transactions being sent to the online charging system, it makes it possible to control and even reduce hardware/cloud processing costs as well as delaying or eliminating the need to pay volume license uplifts for the online charging system



TOGETHER, YOU WIN.



→ **Proven Scalability**—CSG 5G Dynamic Charging Function is proven in production deployments handling billions of transactions per day. There will be a rapid increase in the number of transactions to be collected and handled in 5G due to use cases such as IoT, and so it is critical to have a proven and scalable charging function in place

→ **NFV and Cloud-Ready**—CSG 5G Dynamic Charging Function is proven in production running in virtual environments on customer premises, as well as CSG’s private cloud and public cloud environments such as AWS. The solution is also running in NFV environments in production and is the only vendor supplied charging function to be certified as “Ready for NFV” by VMware

→ **Deployment Flexibility to Facilitate Network Slicing and Microservices**—CSG 5G Dynamic Charging Function can be deployed as a central mediation function sitting across all 5G network slices, or as multiple in slice instances. The web-based user interface provides the ability to monitor, control and configure multiple distributed instances from a single pane of glass. The deployment flexibility provided ensures that any required mode of operation can be supported

→ **Flexibility to Evolve At 5G Speed**—5G standards and use cases are still being defined. CSG’s 5G Dynamic Charging Function provides the flexibility for service providers to define and evolve their mediation business logic and processing as requirements become clear

ABOUT CSG

For more than 35 years, CSG has simplified the complexity of business, delivering innovative customer engagement solutions that help companies acquire, monetize, engage and retain customers. Operating across more than 120 countries worldwide, CSG manages billions of critical customer interactions annually, and its award-winning suite of software and services allow companies across dozens of industries to tackle their biggest business challenges and thrive in an ever-changing marketplace. CSG is the trusted partner for driving digital innovation for hundreds of leading global brands, including AT&T, Charter Communications, Comcast, DISH, Eastlink, Formula One, Maximus, MTN and Telstra. To learn more, visit our website at [csgi.com](https://www.csgi.com) and connect with us on [LinkedIn](#) and [Twitter](#).