Cisco ASR 5000 Multimedia Core Platform

As a mobile operator, you've deployed a mobile broadband network that provides subscribers with Internet access, messaging, streaming video, audio downloads, and other data services.

The result is significant gains in average revenue per user (ARPU). However, this is just the beginning. More advanced, interactive multimedia services, such as location-based applications, video on demand (VoD), social networking, and IPTV, will further increase usage of multimedia services and substantially increase the demand on your network, as well as profit potential.

In order to deliver a superior subscriber experience, you must build a high-capacity, mobile broadband core network capable of significantly improving control of individual subscriber sessions. This network must handle bandwidth-intensive, real-time multimedia services, such as voice, video, and TV – all the while preparing to migrate to 4G technologies.

A true mobile broadband core network starts with the system intelligence and high performance of the Cisco® ASR 5000 Multimedia Core Platform. The Cisco ASR 5000 is built for the high-demand mobile core network environment and the delivery of today's various multimedia services. The platform is deployed in the networks of many of the world's most prominent mobile operators – operators who expect the most of their core networks.

The platform is ideally suited for mobile broadband networks that require market-leading performance, intelligence to shape the subscriber experience, superior network architecture flexibility, and robust availability.

Cisco ASR 5000 Architecture

The Cisco ASR 5000 delivers powerful technology with innovative design. It features a distributed architecture, high-performance capabilities, service assurance, and subscriber awareness that set it apart from the competition.

The distributed architecture incorporates a blend of high-performance processing, significant memory, and powerful switch fabric to intelligently and reliably support mobile sessions. Call control and packet forwarding paths are separated on different control and data switch fabrics, reducing the number of traffic-flow inefficiencies, which diminishes latency and accelerates call setup time and handoffs.

With the distributed architecture, all tasks and services can be allocated across the entire platform. This unique approach allows you to deploy more efficient mobile networks that can support a greater number of concurrent calls, optimize resource usage, and deliver enhanced services, while also providing easy scalability.

Network Flexibility

Enabled by its powerful distributed architecture, the Cisco ASR 5000 platform is access-independent and can be seamlessly deployed in various access networks with the following functions:

UMTS/HSPA

- Gateway GPRS Support Node (GGSN)
- Serving GPRS Support Node (SGSN)

CDMA/HRPD/eHRPD

- Packet Data Serving Node (PDSN)
- Foreign Agent (FA)
- Home Agent (HA)
- HRPD Serving Data Gateway (HSGW)

LTE Evolved Packet Core (EPC)

- Mobility Management Entity (MME)
- Serving Gateway (SGW)
- PDN Gateway (PGW)
- Evolved Packet Data Gateway (ePDG)

WiMAX

- Access Service Network (ASN) Gateway
- Home Agent (HA)

Wi-Fi

- Security Gateway
- Call Session Control Function (CSCF)

Femtocell

- Security Gateway
- Home Node B Gateway (HNBGW)
- Call Session Control Function (CSCF)

Since the network functions required for any of these access technologies can be combined in a single Cisco ASR 5000 platform, you can realize significant operational savings and a simplified network. The flexibility of the platform further enables you to prepare for next-generation technologies, such as Long Term Evolution (LTE). As a result, your 3G investment is secure when you migrate to 4G.

Redundancy and Availability

The Cisco ASR 5000 employs full hardware and software redundancy, as well as high-availability software techniques.

The platform can anticipate faults and provide quick, non-session-disrupting recovery to maximize network uptime, maintain user sessions, retain billing information, and help ensure a high-quality experience.

Figure 1. The Cisco ASR 5000 Provides Multiservice, Multi-Access Capabilities
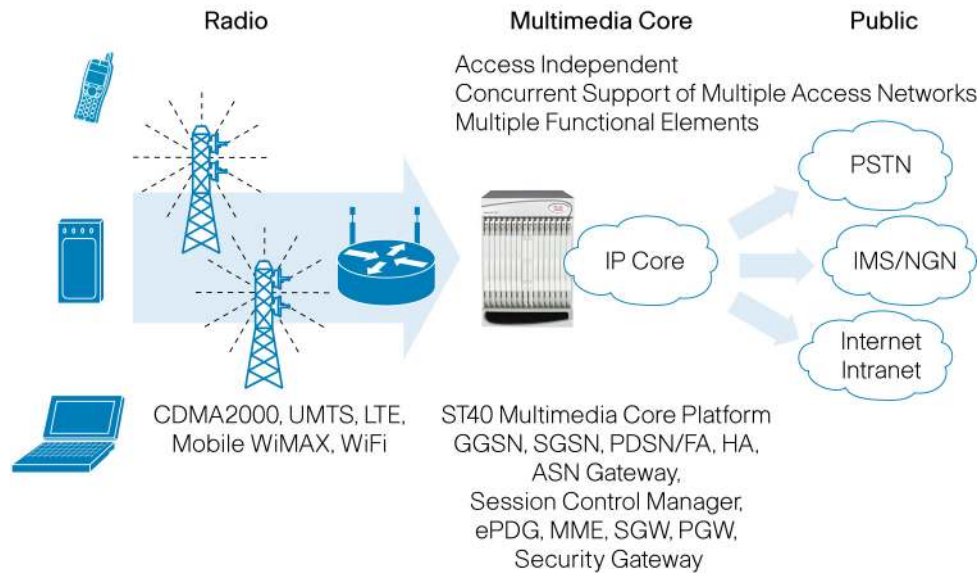
The self-healing attributes include:

- Session recovery
- Fault containment
- State replication
- Task checkpoint and migration
- M:N or 1:1 redundancy for all hardware elements
- Dynamic hardware removal and additions – hot-swappability
- Inter-chassis session recovery or geographic redundancy between multiple platforms

In-line Services

The integrated intelligence enables the Cisco ASR 5000 platform's unique in-line services, which allow you to achieve a higher degree of optimization, lower operating expenditures, and higher levels of service assurance versus solutions that require external platforms through a variety of advanced applications, such as:

- Enhanced content charging
- Stateful firewall protection
- Application detection and optimization
- Content filtering
- Network-based traffic optimization

In-line services at the network edge increase network scalability through simple distributed service deployment, reduce latency by streamlining the network, protect subscriber sessions with powerful security capabilities, and reduce the total cost of ownership (TCO) through integration. The Cisco ASR 5000 employs the latest encryption and security software and firmware for the vital protection of subscriber sessions. Various authentication protocols are used to secure network access to valid subscribers while IPSec encryption and termination provide a secure and private session.

Intelligence at Work

The Cisco ASR 5000 can recognize different traffic flows, which allows it to shape and manage traffic while interacting with applications to a very fine degree. The platform achieves this through session intelligence that utilizes deep packet inspection (DPI) technology, service steering, and network-based traffic optimization to dynamically monitor and control sessions on a per-subscriber/per-flow basis.

The platform interacts with and understands key elements within the multimedia call – devices, applications, transport mechanisms, location, session-state, policies – and assists in the service-creation process by:

- Providing a greater degree of information granularity and flexibility for billing, network planning, and usage trend analysis
- Sharing information with external application servers that perform value-added processing
- Exploiting user-specific attributes to launch unique applications on a per-subscriber basis
- Extending mobility management information to non-mobility-aware applications
- Enabling policy, charging, and quality-of-service (QoS) features

Enhanced Operating System and Management

The Cisco ASR 5000 uses StarOS™ operating system, a customized, real-time version of Linux that provides a robust and highly flexible operating environment. The operating system is designed to distribute and manage sessions across the entire platform through:

- Application hosting capabilities
- Modular distributed processing
- High-availability features
- Robust development environment
- Context support allowing multiple logical systems to exist in one platform

The platform can be managed locally and remotely through the following:

- Command-line interface (CLI) supporting telnet, SSH, and local login through a console port
- Web management using an advanced CORBA-based application
- SNMP support for event notification

For More Information

For more information, visit www.cisco.com/go/mobileinternet.

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