Lucent Technologies
Bell Labs Innovations

Enhanced Media Resource Server

The Versatile Service Platform for a Demanding, Competitive Market

In today's highly competitive telecommunications market, carriers and service providers are significantly impacted by the rapid growth in technology and diverse demands for fixed (wireline), mobile (wireless), and Internet Protocol (IP)/data services. In order to differentiate themselves from rivals, carriers must be in a position to provide new and exciting services to their current customers and also expand into new market areas — quickly. While a large number of vendors specialize in single services and single-use platforms, the Lucent Technologies Enhanced Media Resource Server (eMRS) is one of the few elements in the Intelligent Network and emerging enhanced services landscape that can support multiple applications on a flexible, growing platform, providing specific advantages.



Through recent technology advances, Lucent now offers carriers one of the industry's most cost effective and efficient platforms, the Lucent Enhanced Services Platform (eSP), which comprises:

- Enhanced Services Manager (eSM)
- Enhanced Services Authoring Environment (eSAE)
- Enhanced Control Server (eCS — formerly Service Control Point),
- Enhanced Services Directory (eSD)
- Enhanced Media Resource Server (eMRS — formerly Compact Service Node/Intelligent Peripheral).

Our eMRS can interface with one or more central office (CO) switches or service switching points (SSPs) to support a wide variety of enhanced services. It can be deployed as either a service node or as an intelligent peripheral with additional software.

Lucent Intelligent Networks

End to End Solutions™

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When carriers want to trial and deploy a number of different services, the eMRS can give them a cost and speed advantage in the market. Using a powerful service creation environment for speedy service programming, carriers can quickly develop and deploy new services. The eMRS platform software also provides a suite of network interfaces and protocols that gives carriers access to multiple markets.

Industry standard hardware helps ensure that the flexible platform can take advantage of the latest advances in technology. Scalable, cost-effective configurations allow carriers to start small in their trials and grow quickly to meet the market demand for their services. The telecom-grade eMRS Operations, Administration, Maintenance and Provisioning (OAM&P) component supports the eSM to adapt the platform quickly to the needs of the market while minimizing operations expense. As the platform grows, clustering eMRSs can continue to provide a cost-effective operations solution. As technology continues to advance and carriers' needs change, the eMRS can evolve to support stand-alone or converged packet and circuit switched networks.

Features To Meet Demands

The Lucent eMRS provides a host of benefits to carriers who must focus on quickly and reliably deploying new revenue-generating services. It is highly scalable. Carriers can add processing units and voice trunks without service interruption. They can grow nodes to thousands of ports and deploy multiple nodes. These capabilities allow carriers to grow their network as demand for multiple services — and complex services — increases.

The eMRS architecture also provides the flexibility that competitive carriers require through its fully distributed software and hardware. This flexibility allows carriers to scale the system and unit configuration to help minimize system cost or to support new services.

Open interfaces are another key feature. Fully documented programming interfaces are included to enhance or develop services and to link to other network elements. And, because the eMRS is built using the same robust eSAE as the other Lucent eSP elements — the eCS and the eSM – carriers can easily develop or modify services as a means of service differentiation.

The high-availability performance capability of the eMRS delivers very high software and hardware reliability, and there is no single point of failure when deployed in our sparing configuration. Therefore carriers can be confident of always being able to provide services to customers.

The multi-functional eMRS can also grow from a stand-alone service platform into an intelligent peripheral in a network with eCSs or eSDs for fixed and mobile switches. To effectively manage this network, other Lucent products can be incorporated into the final solution for maximum impact, including eSMs, OneVision® Network Fault Management, and *NetMinder*® System. This configuration provides carriers with options in applying the eMRS as a point solution or in conjunction with other IN elements.

One of the most pressing carrier demands is faster time to market with new services. The carrier who uses the eSAE or partners with Lucent and/or third parties can quickly deploy new or customized existing applications. Lucent can provide the integration and project management expertise to help deploy and integrate large scale eMRS solutions.

As carriers enter global markets, their need for an open platform supporting multiple languages increases. Lucent has partnered with multiple speech vendors in providing a vast array of languages and dialects to support both automatic speech recognition (ASR) and text-to-speech (TTS) applications.



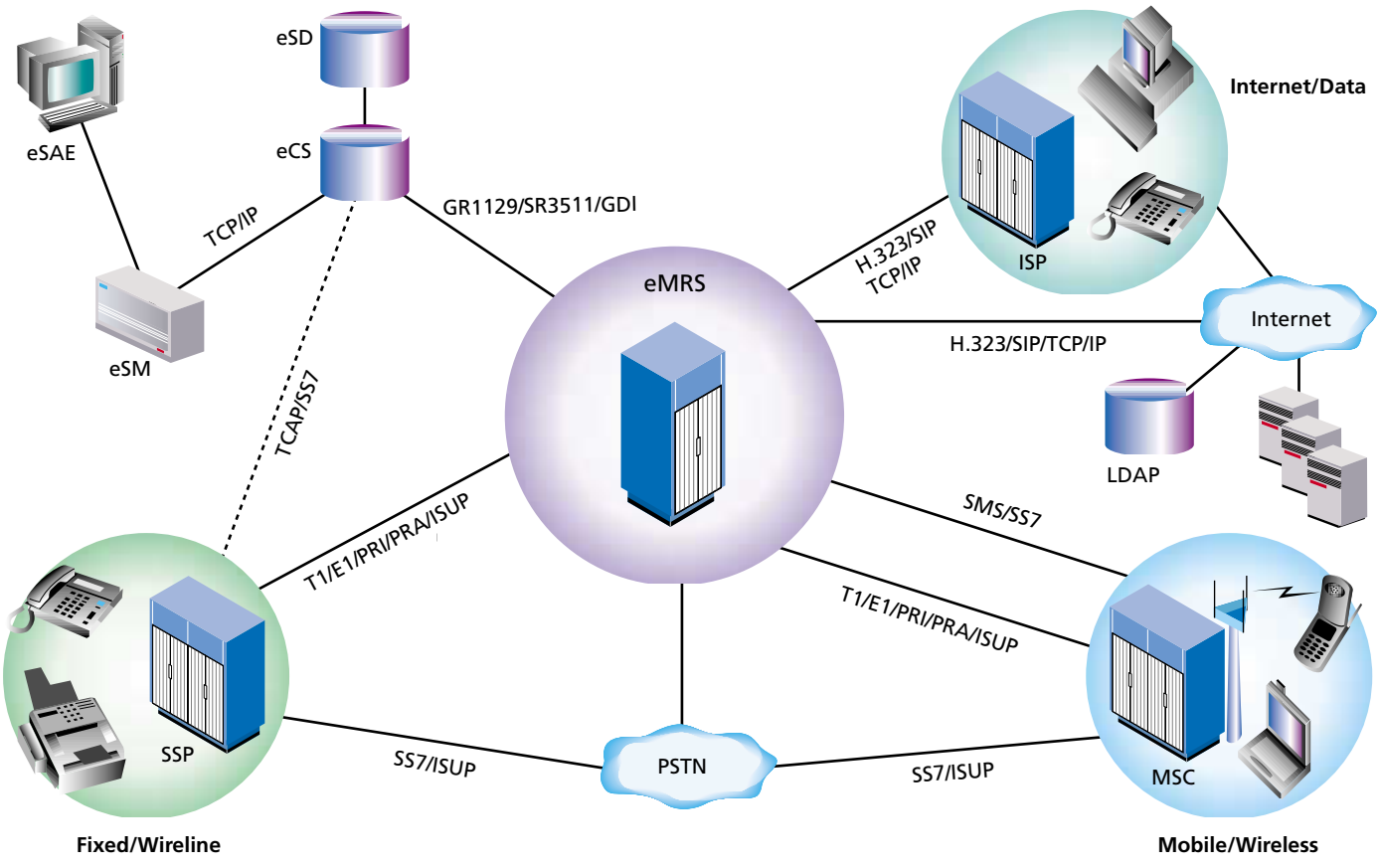
The Central Player in Network Architecture

The eMRS is uniquely qualified to be deployed at the center of converging fixed, mobile and data networks, due to its flexible hardware and software. A carrier can deploy the eMRS either in one or more networks or as a bridge across networks. eMRS's wide variety of protocols and switch independent interfaces supported for markets worldwide allows it to perform even in mixed networks of new and legacy equipment.

The flexibility that the eMRS brings to network planning enables carriers to evolve their network and differentiate their service offering. An eMRS system configuration can change from a centralized to distributed node implementation. Multiple eMRSs can be deployed clustered together at the same site or as distributed clusters across a carrier's network. Closer connection to customer care and billing (CCB) systems is also possible. The eMRS provides the necessary building blocks to provide CCB information to a variety of systems. It also uses technology from numerous suppliers to support multi-vendor technology, such as voice recognition and text-to-speech solutions.

As carriers' networks evolve and voice circuit and packet technologies converge, intelligent networking can be used to provide enhanced services from both domains. With the appropriate interworking, the same features and services can be delivered to endpoints served by either circuit or packet networks transparently. The layered structure of Lucent's eSP elements allows updates to specific interfaces without impacting the enhanced services supported by the eMRS.

The Lucent eMRS plays a central role in convergent network architecture.





Evolving with the Market Needs

Since the initial introduction of the Service Node (SN) and Compact Service Node/Intelligent Peripheral (Compact SN/IP), forerunners to the eMRS, Lucent has incorporated strengths through continuous improvements and enhancements to maintain its position as one of the most efficient and cost-effective platforms in the market. The SN made way for the Compact SN/IP in many carriers' networks. Increased flexibility, scalability, and cost-effectiveness were key in that movement.

Technology advances, in addition to customer requirements, has further driven the evolution of the SN platform. With each change, carriers have seen enhanced performance, capacity, and reliability as well as cost savings. The eMRS evolution and migration strategies are grounded in industry standard technology. Commercially available industry standard hardware and design improvements to increase performance also lead to lower incremental price-per-port costs.

The eMRS evolution plan balances the latest technology improvements with support and migration for installed Compact SN/IPs. Changes to replace or improve the hardware attempt to be transparent to the application, with adjustments handled in the platform software and underlying firmware and, where possible, improvements to the platform are backwards-compatible to Compact SN/IPs in the field.

Enhanced performance and capacity have most recently been achieved through processor, chassis and disk upgrades. Upgrading the central processing unit (CPU) boards increases the capacity on the eMRS for services that are currently CPU-bound. It can decrease the number of eMRSs needed by a carrier to provide a given service, or it can allow capacity to be grown by simply upgrading the processor. Additionally, this processor upgrade efficiently uses the PCI segment of the backplane to provide added Ethernet and SS7 capacity, allowing carriers to deploy TCP/IP and SS7 port-bound applications with fewer units.

The original Compact Service Node design was to provide speed to market. Design changes have focused on improving the product's ease of maintenance and disk capacity. The latest design adds serviceability and additional maintenance features to increase OAM&P efficiency and availability. Lucent is committed to continuing enhancements to help provide greater reliability, increased revenue, and lower operating costs.

Support for a Marketplace Revolution

The eMRS continues to evolve with technology, providing carriers with even more robust, cost-effective solutions for meeting their business needs. Lucent is leveraging new technologies to achieve product and performance improvements on many levels:

- **Compact PCI technology**, driving performance gains and an increase in reliability and serviceability of the platform while protecting current platform investments.
- **Higher port density**, allowing carriers to continuously reduce their price-per-port and floor space requirements.
- **Common resource cards**, reducing the number of configurations, thereby helping lower costs of deployment for carriers through faster time to market and improved ease of maintenance.
- **A dual backplane and CPU**, increasing reliability within the chassis.
- **Performance tools**, assisting carriers in planning and managing their enhanced services on their eMRS platform.
- **Introduction of the clustering architecture**, bringing the SN and eMRS together as simply the eMRS residing on a common hardware and middleware platform.

Whether deployed in a traditional or clustered architecture, the latest Lucent eMRS features and design enhancements can provide a highly reliable, flexible, and cost-effective solution, which especially addresses the following:

Platform Technology

- Migration from a proprietary to an open, industry standard commercial hardware/software platform.
- Latest *Intel*® technology to increase processor speed and efficiency.
- Compact PCI technology to increase performance, reliability, and serviceability.
- Future convergence of circuit and packet requirements on same platform.

Speed to Market

- Scalable and flexible platform to provide a low-cost entry point for subscriber-based SN services.
- Service transparency in common middleware to minimize coding and use existing software packages across eMRSs and SNs.
- Multiple speech vendors to increase ability to enter global markets quickly.

Service Applications

- Use of the Lucent eSAE for speedy service programming.
- Deployment of the extensive Lucent service portfolio as well as third party-applications to help reduce both development costs and response-time to market needs (or opportunities).

Service Performance

- eMRS to maintain or improve existing SN reliability.
- Single platform to eliminate feature development and testing on multiple hardware platforms, thereby helping reduce time and costs associated with OAM&P.
- Single point in cluster to reduce operations time and effort in OAM&P tasks.
- Fewer, more durable, and hot "swappable" components to help reduce maintenance cycle and increase service availability.
- Clustering architecture to provide the ability to add eMRSs to an existing cluster without service disruption.

Investment Protection and Cost-Effectiveness

- An evolution/migration path for existing SN and eMRS customers to the latest technology eliminating the need and expense to support two service node-type hardware platforms.
- An evolution path from stand-alone eMRS to clustered eMRSs.
- A common platform to allow economies of scale by applying the same hardware across all eMRS deployed applications.
- Scalable and flexible platform configurations helping to lower set-up costs (vs. SN) and shifts to a "pay as you grow" paradigm.

These and other future eMRS product improvements focus on increasing technology and product enhancements to improve performance and cost-effectiveness, managing services and subscriber data, and increasing the reliability of the chassis, as well as supporting emerging network technology and standards.

Lucent has developed and is actively evolving its eMRS product to continually provide one of the most cost-effective and efficient platforms in the industry, through:

Technology enhancements, which help improve

- Speed to market
- Performance and capacity
- Reliability and availability
- Flexibility
- Scalability

Investment Protection

- Helps reduce costs in platform and operations
- Software and firmware adjustments vs. hardware swap-outs
- Industry breakthroughs

The Complete Service Platform Solution

The fundamental question of carriers in today's telecommunications service market is "How do I profitably deploy new services faster and more cost-effectively to establish market presence before my competitors?" Driven by carriers' current and anticipated requirements for speed, performance reliability and efficiency, cost-effectiveness, flexibility and scalability, vendors are aggressively offering IN products and services. In this environment, the Lucent eMRS offers one of the most efficient and cost-effective platforms today. It provides carriers the flexibility to enhance the platform for future services that easily interface to either CO switches or SSPs.

Backed by a team of over 1,000 Lucent Technologies professionals, carriers can select from and deploy a vast menu of already-developed services, or quickly transform their own innovative ideas to revenue-generating services. Third party service alliances complement Lucent resources in developing new and existing applications. When a carrier is ready to deploy the eMRS platform and services, Lucent eSP integration and project management professionals are available to provide the expertise to quickly bring the final solution to market.

The Lucent eMRS is one of today's market leaders, a critical network element for carriers whose success depends on a flexible, reliable, cost-effective platform from which new revenue-generating services can be deployed quickly into the market. The expertise, commitment to product evolution, and customer obsession that is fundamental to Lucent helps ensure that the eMRS can continue its critical role in the emerging marketplace of tomorrow.

Acronyms

eCS –	Enhanced Control Server
eMRS –	Enhanced Media Resource Server
eSAE –	Enhanced Services Authoring Environment
eSM –	Enhanced Services Management
eSP –	Enhanced Services Platform
IN –	Intelligent Network
ISP –	Internet Service Provider
ISUP –	Integrated Services Digital Network User Part
LDAP –	Lightweight Directory Access Protocol
MSC –	Mobile Switching Center
PRI/PRA –	Primary Rate Interface / Primary Rate Access
PSTN –	Public Switched Telephone Network
SMSC –	Short Message Service Center
SS7 –	Signaling System 7
SSP –	Service Switching Point
TCP/IP –	Transmission Control Protocol/Internet Protocol
TCAP –	Transactional Capabilities Application Part
WAN/LAN –	Wide Area Network / Local Area Network

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