



White Paper

**Completing the Journey
to a
Multimedia Generation Network
(MGN)**

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1. Overview

Every business has a measurement for success, and for communication service providers the measurement is average revenue per user (ARPU). Service providers are constantly seeking ways to increase ARPU while simultaneously lowering their costs. To do this, service providers have become very focused on how to rapidly move their service portfolio from traditional, voice-oriented, circuit switched services to one built on IP-based multimedia services. In addition, service providers now realize that they need to develop a service delivery infrastructure that enables them the flexibility to partner and compete with Internet-based service providers.

Concurrently, over the last several years, the next generation network (NGN) architecture, powered by IMS has been developing. The NGN/IMS architecture provides the flexible, IP-based, service delivery platform service providers need, however; the path to migrate from today's network to the full NGN is complex and difficult to justify in a business case. While service providers in general agree that if they could start from scratch they would build an "NGN," few have the opportunity to perform a complete forklift upgrade to their network and disrupt existing services, which pay the bills.

So while the service providers' goal is to create a network that enables them to deliver numerous differentiated and complementary services to their customers, the question with which they are all struggling is how to begin what will be a complex, lengthy journey. Veraz Networks believes the answer lies in recognizing that service providers need a network evolution path that leverages their existing assets and service portfolio, while paving the way for multimedia service delivery. Consequently, Veraz enables service providers to undertake and complete the journey to a Multimedia Generation Network (MGN).

2. The Multimedia Generation Network

What is an MGN? Rather than being defined by technology, an MGN is defined by what it enables an operator to do; namely:

- ❖ Lower the cost to create and deliver services
- ❖ Utilize third-party developed applications
- ❖ Deliver services across any access network
- ❖ Optimize the end-user experience
- ❖ Flexibly evolve to enable new services

Ultimately, the service provider needs to be able to deliver a diverse portfolio of services to the end user, regardless of over which access network the services are being carried. An MGN network provides a customized end-user experience, and enables the creation and addition of new services, all delivered cost-effectively.

3. The Evolution of Networks

The path to an MGN network necessarily takes place in several steps. For service providers, the first step was when they introduced a packet-core network to support DSL and business data services. While the circuit core continued as the platform for voice services, both the packet core and circuit core connected to individual service platforms with their own individual interfaces into separate operations, customer care, and billing systems. These legacy circuit and packet networks were characterized by a long development and introduction cycle for new services, largely because each service had its own separate service delivery silo. In addition, there was also a high cost to deliver new

services, as each service required a customized set of operations system (customer care, provisioning, billing, etc.).

Recently, service providers have begun replacing the circuit core with a converged IP core that would handle both their legacy circuit and data services. This converged IP-based core should significantly lower the transport costs for legacy circuit applications but does not address the service delivery silo infrastructure. Even with the converged packet core, services are still managed in separate silos and are supported by access network specific devices and clients. While there are now lower costs for transport, the high investment cost for new services still remains, and services are still tied to specific access networks.

The final, and most challenging, step, toward a MGN is converging the service creation and delivery infrastructure across all services and eliminating the linkage between access networks and services. By doing this, services can be created uniformly, independent of the access network over which the service is being delivered, with a single interface to billing, customer care, and OA&M systems. This will dramatically lower service development time and cost, and enhance the opportunity for new service creation through open interfaces.

4. MGN Architecture

The MGN architecture is defined by the following layers: Media Layer, Control Layer, Service Delivery Layer, and Management Layer. Each layer has a unique set of characteristics.

4.1. Media Layer

The media layer is a distinct layer in the MGN, separate and independent from the control layer. The media layer relies on the control layer for routing and service enablement functions which results in decreased complexity as the network scales and applications become more complex. This independence is important as networks grow over time to allow cost-effective scaling. It also becomes important as new media devices are introduced. For example, as video applications become more predominant, new video gateways may be introduced. This would mean that these new media devices would need to be introduced without requiring new signaling architecture. By separating signaling and media, this is accomplished.

The media layer provides transcoding as well as security. Bandwidth optimization is also an important function in the media layer. Lastly, it is critical to provide quality of service at the media layer to give service providers the tools needed for service differentiation.

4.2. Control Layer

The control layer is the brain of the network. A key requirement of the control layer is the ability to translate the unique connectivity and handling requirements of any service, legacy or multimedia, TDM or IP, into generic requirements for the media layer. This means service providers can develop and deliver new multimedia services without going through long, complex, upgrades of their control layer. In addition to being application-aware, the control layer should be highly distributed to ensure optimal placement of resources, but centrally managed to simplify control and minimize OPEX. Signaling security must also be provided to ensure the integrity of the control layer.

4.3. Service Delivery Layer

The service delivery layer hosts the applications that the service provider offers, opens the network for third-party applications and ties into the control layer to enable real-time service delivery and management. The service delivery layer must support existing legacy services at a lower cost than traditional service silos and enable service providers to add new multimedia services quickly. This

enables service providers to migrate to MGN at their own pace and deliver enhanced services that leverage their existing service portfolio and assets. The ability to differentiate services by quick and easy customization, as well as the ability to package features together in different bundles is also key to creating a multimedia generation network.

4.4. Management Layer

The management layer plays a critical role in reducing network operating expense. By tightly integrating the three individual layers, the management layer provides a single network view for end to end session control. The management layer must also provide real-time management and the flexibility to support existing and new service concepts and business models.

5. The Veraz MGN

Veraz is leading the journey to the Multimedia Generation Network by providing the critical functions required at each layer with the flexibility for service providers to mix and match capability and evolve as it makes business sense.

5.1. Increase Capacity, Decrease Complexity

The MGN media layer, where the Veraz I-Gate 4000 family of media gateways and the Network-adaptive Border Controller (BG) reside, provides media security, QoS, transcoding, and industry-leading bandwidth optimization while maintaining outstanding voice and video quality.

5.2. Unified Control, Distributed Architecture

The control layer, which includes the Veraz ControlSwitch™ and Network-adaptive Border Controller (IBCF), provides optimized, secure connectivity for any mix of TDM and IP services. Veraz has a long history and understanding of legacy signaling protocols and has demonstrated its ability to accommodate the wide range of requirements in this arena.

The Veraz ControlSwitch is highly distributed to enable service providers to determine the optimal placement of resources, while providing centralized control for maximum flexibility in deployment and contained operational costs.

5.3. Any Application, One Implementation, without Network Duplication

The Veraz Open Service Broker and Policy Engine are critical components of the service delivery layer and support both Veraz-developed and third-party applications. The combination enables any application to be customized and delivered across any access network with faster rollout and decreased management complexity. Veraz enables service providers to open their service creation environment to third-party developers through the Open Service Broker's open APIs. The Open Service Broker and its XML engine enable service providers to deliver best-of-breed applications by allowing service providers to mix and match service logic from multiple sources into a seamless application. Veraz provides a wide range of applications, as well as a number of 3rd party integrated applications, through certified Veraz Open System Alliance (VOSA) partners.

In addition, Veraz also offers a cross-platform soft client, verazVirtu, which can be customized for the service provider. The verazVirtu soft client offers a tightly integrated and optimized end-user experience across a service provider's multimedia application portfolio that supports a unified experience across any platform: mobile as well as personal computer.

5.4. One System, One Bill, One Call Record

The VerazView Element Management System provides a single view of the entire network to simplify network management and reduce operating expense. With VerazView, service providers no longer need to compare call traces across network elements, but can see an end-to-end session trace in a single click of the mouse. Full FCAPS (Fault, Configuration, Accounting, Performance, Security) capability is available through VerazView, as well as an open northbound interface for BSS/OSS integration.

6. Veraz MGN Proof points

6.1. Enabling access-aware service delivery

In a Tier 1 Asia-Pacific region network, Veraz is deployed to deliver services over integrated access devices (IADs) and multi-service access nodes (MSANs). The service provider needed to differentiate what services were being delivered over each network (whether copper or fiber), without having a dedicated service delivery silo for each access network. The Veraz Open Service Broker and Policy Engine enable this service provider to allocate a specific suite of services over each network, and provide billing information dependent on the access network. The service provider is able to provide and bill for access network specific services, but with operational ease and low cost. Veraz delivers access-aware service delivery.

6.2. Flexibly Evolve to Support Tomorrow's Services

Veraz has wide deployment experience delivering services over PSTN and mobile networks, whether TDM, IP, or any combination. Veraz has demonstrated its ability to deliver services through its standards compliant architecture. This track record demonstrates the flexibility of the Veraz MGN to quickly and easily support new services, without requiring forklift upgrades or large new capital investments.

6.3. Open the Service Creation Environment

Veraz provides a wide range of in-house developed applications for quick and easy deployment, built on the Open Service Broker. Veraz' open application interfaces (APIs) and XML interface enable quick integration of third party applications, as well as customization of existing applications. Through the Open Service Broker and Policy Engine, Veraz is able to provide a wide range of combinatorial services that can blend and/or extend individual services.

6.4. Deliver services across any access network

Veraz has field proven support for PSTN, 2G/3G, WiFi, and WiMAX access networks. Because the service delivery layer provides the single interface to the media layer, services and the control layer do not require changes to interface with access networks, enabling the service provider wide flexibility in determining how to reach their end-users.

6.5. Lower the cost to create and deliver services

The cost to create and deliver new services includes the time required to create the service and then set-up the service through the network and back-office systems to ensure provisioning, billing, and troubleshooting. The VerazView EMS provides a single interface into the media, control, and service delivery layers to integrate service creation, network, and back-office assets to improve time to revenue and decrease operating expense.

7. Leading the Journey to Multimedia Generation Networks

7.1. Case Study #1—The Complete Journey from Legacy Network to MGN

A European operator with a legacy TDM infrastructure wanted to move to an IP core to reduce expenses and to have the capability to add new multimedia services in the future. However, the operator had multiple versions of ISUP and PRI signaling interfaces that had to be maintained, as well as ISUP/TCAP calling features. There were also country specific regulatory features that an IP solution had to provide. The European service provider chose Veraz to guide their journey to MGN for the following reasons:

- ❖ Deep experience migrating TDM networks to IP
- ❖ Support for their investment in SS7-based services
- ❖ Quick and easy customization of services
- ❖ Ability to extend service offering to multimedia
- ❖ Integrated softclient

The first phase of the MGN journey required changing out the TDM switches for the Veraz ControlSwitch, and adding the I-Gate 4000 Media Gateways to convert the TDM traffic to IP. By seamlessly inserting the Veraz ControlSwitch, the service provider was able to maintain their SS7 signaling services through the Veraz service delivery layer. The cost savings from the packet core easily justified the business case, and the core infrastructure was put into place; now the operator could add new multimedia services quickly and easily, when they were ready.

To complete the journey to MGN, the service provider then leveraged the strength of the Veraz service delivery layer to add new multimedia services, such as video telephony, presence/chat/ instant messaging, and Presence and Prepaid Notifications. Utilizing the verazView softclient, the service provider can now compete with Skype's offering and augment that with differentiated multimedia services. In less than six months, the operator surpassed one million softclient subscribers.

The Veraz Device Manager is enabling the service provider to control the end-user experience. When an IAD is plugged into the network, the Device Manager checks the IAD to ensure it has the correct load and if it does not, pushes the correct load down to the IAD, thus ensuring customer satisfaction.

Using Veraz, the service provider was able to complete the full cycle from legacy network to Multimedia Generation Network in about four years, at the pace that made business sense, without having to disrupt existing services or forklift their infrastructure.

7.2. Case Study #2—Greenfield MGN Build

ONEMAX is a mobile operator in the Dominican Republic. They saw an opportunity to compete with the incumbent by providing mobile data services to small and medium enterprises, expanding to residential users. ONEMAX chose the individual vendors for the various portions of the network. They required a solution that could integrate a wide variety of vendors. ONEMAX chose Veraz because the MGN solution had demonstrated its ability to deliver the services that ONEMAX needed. Veraz was able to integrate Alcatel-Lucent's Radio Access Network, NextPoint's SBC, a number of third party applications, ZyXEL IADs, and Cisco routers, and deliver a working network. Veraz is able to deliver end to end session QoS, enabling ONEMAX to price services based on QoS and volume, thereby providing service differentiation.

8. Summary

In the increasingly competitive battle to win and retain customers, service providers need to be able to quickly and easily roll out new services and customize the end user experience, all while controlling costs. Today, service providers are faced with choices that typically require significant fork-lifts of existing assets or up-front investments without a clear financial return. A Multimedia Generation Network combines the service flexibility that an operator requires, with a migration path that makes business sense.

Veraz has been working with service providers worldwide to provide cost-effective network solutions that maintain existing services, enable new services, and lower operating expenses. No two networks are alike, and Veraz is able to easily configure the right solution that fits the specific business case. Veraz is truly leading the journey to Multimedia Generation Networks.