



SAFARI C³™

Media Switching System

Finally, someone listened...

Emerging from the untamed and unproven wilderness of packet telephony offerings, the NewVoice™ for Carrier Class Cable (C³) has arrived.

The NewVoice™ of the Cable Network has emerged from a myriad of overly complex, mismatched, high cost and yes, under-achieving telephony “solutions” for the Cable Industry. SAFARI C³ Media Switching System from Cedar Point Communications empowers cable providers of any size to offer competitive, life-line voice services to customers using a “cable-centric” approach for superior operational economics. By leveraging revolutionary PacketClass™ Technologies, SAFARI C³ removes the business and technical obstacles that have impeded the delivery of voice services, while creating a new standard for carrier-class cable.

Features & Benefits

PacketClass technologies bring unprecedented carrier-class attributes to the packet environment via unique patented approaches. Our technologies transform traditionally complex and costly voice services into a simple, ready-to-use, PacketCable™ based voice switch solution:

- **SecureClass™ — Secure Media Processing & anti-hacking technology make your voice network a fortress of privacy and security.**
- **FiberClass™ — An all-optical backplane delivers total scalability and investment protection.**
- **VoiceClass™ — Utilizing unique techniques to allow any voice traffic (i.e. VoIP and circuit voice) to be switched simultaneously over an all packet environment.**
- **FeatureClass™ — Simple implementation of CALEA / E-911, and rapid delivery of advanced features with feature flow technology.**

Until now, cable operators looking for a VoIP telephony solution have been presented with mismatched telephony products, developed for other industries and other classes of providers. Cedar Point understands that the right cable telephony solution requires a fundamentally different, “cable-centric” approach — one that is designed from the ground up for cable operators, one that meets their operational and business requirements.

And SAFARI C³ does just that. SAFARI C³ is a carrier-class cable telephone solution, built on the premise that network quality and reliability can never be sacrificed for any reason — Period.

Moreover, SAFARI C³ was designed with consideration of the entire cost of ownership. SAFARI C³ enables cable providers of any size to realize substantial, comparative savings for initial equipment and integration costs, as well as the long-term ben-

efits of impressive returns in ongoing operational cost savings.

SAFARI C³ makes this possible through advanced, enabling PacketClass technologies, which take into consideration the multi-media nature of packet-based networking, and also extract the essence of what has made today's telephone network a highly reliable, available, operationally sound, secure, & private network.

SAFARI C³ combines these elements to form a single, simple, yet revolutionary PacketCable™ based telephony solution which allows cable providers to rise to the challenge of delivering a true carrier-class voice network.



Lesson # 1:

You can't fit a square peg into a round hole.

Many Choices

All telephony products in today's voice switching marketplace basically fall into one of two categories: they are either legacy, circuit switched systems or newer distributed, soft-switched systems.

For the majority of cable service areas, neither option meets most of the quality and/or operational requirements. Still, telephony vendors try to fit a square peg into a round hole by offering cable operators products that are designed for other industries and applications. The bottom line is that because these products do not address the strategic needs and requirements of the cable industry, they just won't fit.

Circuit Switching Systems

Although circuit switching systems are the standard switching for primary voice quality and reliability in today's telephone network, they were not designed for packet environments or cable networks. Obstacles include a lack of downward scalability, a lack of rapid and easily deployable feature creation, complex implementation, no integrated multi-media streaming capabilities, and a very high cost of ownership.

As a result, cable operators can only selectively deploy these large, higher cost systems. Even then, they must wrangle with many ongoing, operational challenges that limit the long term viability of circuit switch solutions.

Distributed Telephony Systems

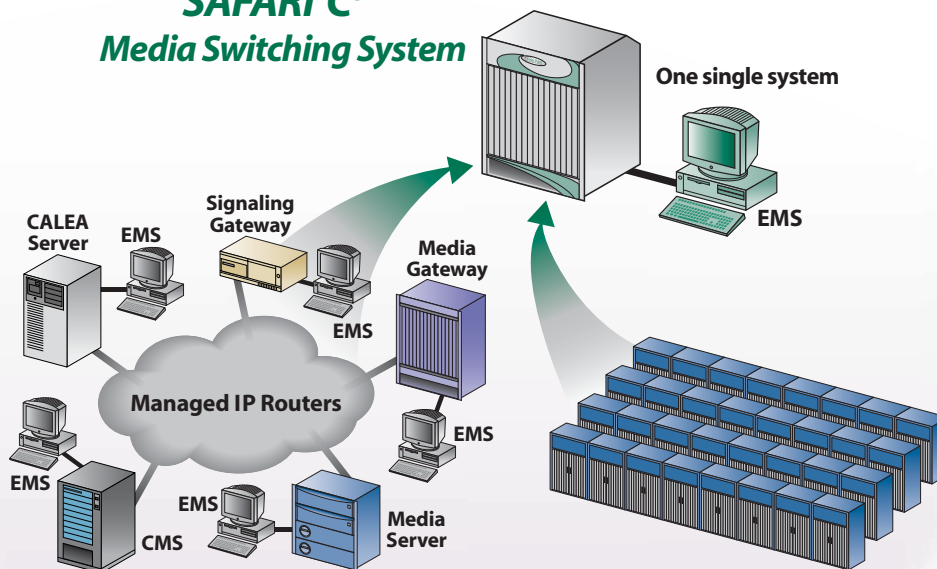
Distributed telephony vendors implement the logical elements of the PacketCable reference model into separate physical elements (illustration below), controlled by a

call agent via many different protocols. These systems take the Class 4 softswitch model and apply it to a service-enabling Class 5 implementation to create an end-to-end VoIP solution. Yet this distributed solution faces many inherent, design and technology-based challenges and shortcomings.

Distributed systems require multiple network elements and up to five different vendors to create *just one voice system*, making implementation highly complex and costly. Consider these other, significant issues:

- **Maintaining vendor interoperability, security & privacy become extremely costly and complex to administer.**
- **Distributed softswitch systems offer no migration path from circuit switched systems.**
- **Dynamic bandwidth management complexities threaten reliability, availability, and scalability — non-negotiable items for providers of carrier-class voice networks!**

SAFARI C³™ Media Switching System



Distributed Softswitching

- Very complex implementation (Elements, Vendors, Protocols)
- High overall cost

Legacy Circuit Switching

- Complex implementation
- Very high overall cost

One Answer.

Designed for cable operators, SAFARI C³ supports both circuit and packet based traffic in one PacketCable based voice switching chassis. SAFARI C³ delivers today's carrier-class voice networking services as well as future multi-media integration, to fit and fulfill the strategic and economic requirements of the entire cable industry.

Lesson # 2:

Not all telephony solutions are created equal.

PacketClass Technologies

PacketClass Technologies take into consideration the ubiquity of packet technologies, and the need to evolve into a multi-media network — with the same quality, availability, security, and privacy available in today's carrier-class circuit switched voice systems. PacketClass technologies enable and accelerate deployment of new services with reduced integration and ongoing operations costs. Below is a description of this powerful technology set.

SecureClass

SecureClass offers new levels of enhanced, systemic privacy (through Secure Media Processing, or SMP), as well as protection against sophisticated violations such as tampering, theft, and Denial-of-Service (DoS) attacks.

By serving a single point for brokering all calls, SecureClass forms a complete umbrella over all network services, removing traditional vulnerabilities and openings, even the most difficult to detect or avoid. No other system can offer this degree of protection, or its benefits:

- **Eliminate customer dissatisfaction and churn from network outages**
- **Improved marketing to increase market share from residential & business customers**
- **Reduced operations cost due to security breaches & network outages**

FiberClass

FiberClass is a first-of-class, all-optical, rate independent backplane technology, which provides virtually unlimited scalability of services. Moreover, FiberClass flexibility allows modular, incremental upgrades to every part of the system, includ-

same quality and reliability as expected in today's Class 5 switches. With state-of-the-art techniques, VoiceClass technology enables SAFARI C³ to provide both VoIP and circuit voice services simultaneously and efficiently — using the same feature set for both applica-

tions. This allows for an elegant migration from circuit voice to VoIP, over a single, cost-effective platform.

FeatureClass

FeatureClass technology's primary mission is to allow quick and easy delivery of new features so that you can focus on your business — not your technology. Create and deliver new advanced features in record time, with RapidFeature™ libraries and visual tool kit — a straight-forward, feature-flow software environment which takes the mystery out of adding new telephony features.

FeatureClass ensures simple implementation of all regulatory features, such as CALEA and E-911, with a rapid creation environment that utilizes feature flow technology to accelerate feature development with automated code generation. With Cedar Point's RapidFeature tool kit, operators are able to create differentiated revenue generating features.



ing processors, power, memory, and throughput.

With FiberClass technology, SAFARI C³ can evolve and adapt to meet any current business, or future technology requirement, without need to forklift and replace antiquated equipment.

VoiceClass

VoiceClass technology delivers voice-sensitive call traffic through an all-packet environment, with the

Lesson # 3:

You can't manage what you can't see.

Introducing SafariView™ EMS

SafariView element management system (EMS) enables cable system operators to manage multiple SAFARI C³ systems, extract system performance information, and integrate SAFARI C³ with existing and future provisioning systems — all while utilizing standard interface protocols.

SafariView delivers features and benefits for next-generation operations management, enabling sophisticated control over the customizing of call features as well as self-provisioning of call services by customers, through a Web browser. SafariView makes tomorrow's vision of telephony operations a reality, today.



A "Cable-Centric" View

All of SafariView's operational objectives and controls are based on extensive research and hands-on understanding of cable industry requirements. SafariView EMS was designed to integrate with your existing cable business, not to ignore or supersede it.

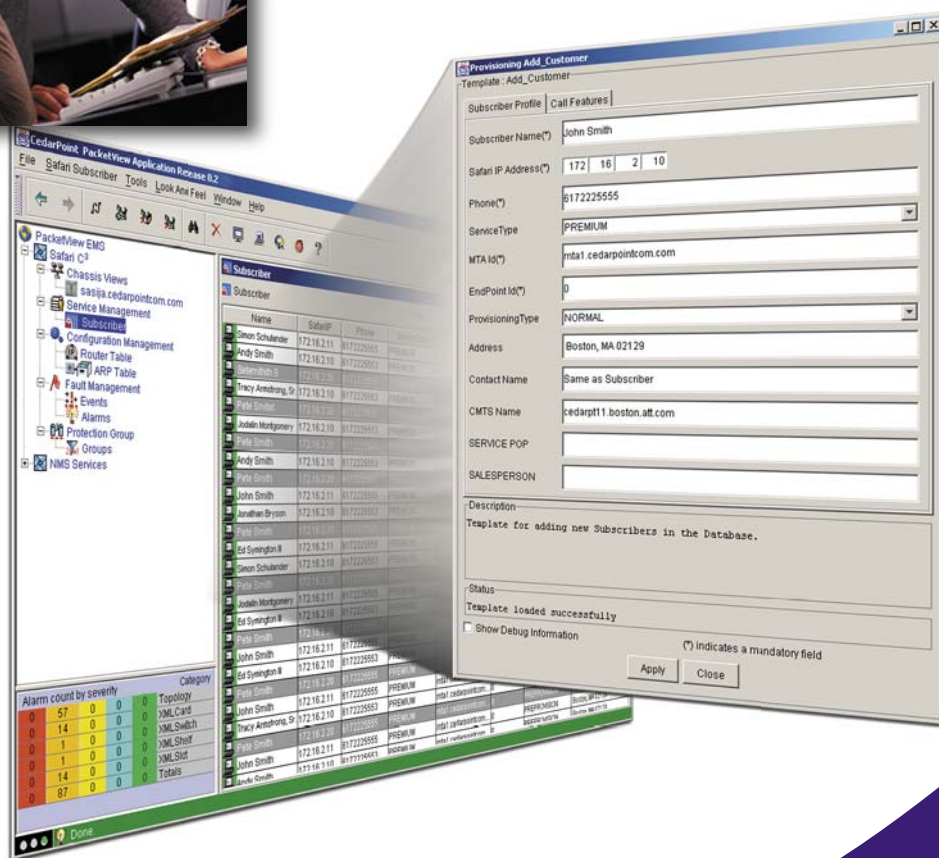
As a result, SafariView enables and promotes:

- Multi-service billing
- Multi-service provisioning
- New marketing methods based on subscriber data (collected per individual home appliance)
- Managed access vs. equal access
- Provider partitioning of resources and interfaces
- New business models for multi-provider environments
- Proper network engineering by resource planning

SafariView Feature Set

SafariView EMS provides features to support service management, subscriber management, fault management, system configuration, accounting, performance and security. Basically, we've included everything (except the kitchen sink) so your business can utilize and manage the full potential of SAFARI C³.

SafariView features are delivered in a custom-tailored platform with extensive API capabilities which enable cable operators to integrate it with their existing "back-office" (or OSS) systems. And SafariView provides these features with carrier class availability (at least 99.999% uptime).



VIEW, MODIFY, ADD AND DELETE SUBSCRIBERS USING THE SAFARIVIEW DYNAMIC, REAL-TIME, AND WEB-BASED GRAPHICAL MANAGEMENT SYSTEM. SAFARIVIEW'S MULTI-TIERED, MODULAR INTERFACE ALLOWS INSTANT "DRILL-DOWN" ACCESS TO DETAILED SUBSCRIBER INFORMATION, AS WELL AS CRITICAL, TOP-LEVEL SYSTEM DETAILS.

Lesson # 4: Choose the path of least resistance.

SAFARI C³ delivers VoIP and circuit switched traffic, in *one* PacketCable™ based voice switching chassis. This design tremendously simplifies implementation costs:

- **Flexible architecture supports cable operators' multi-service, multi-media environments**
- **One system means only one integration effort**
- **Simplified operations, unmatched anti-hacking and privacy**
- **Elegant migration from current methods of voice deployments**

SAFARI C³ will make the addition of your new voice services profitable. Consider these operational savings, compared with distributed softswitch and legacy circuit switch solutions:

- **Floor Space — 67% to 95%**
- **Sparing — 75%**
- **Power — 86%**
- **Maint/Provisioning/Mgmt — 60%**

Moreover, SAFARI C³ offers scalability and flexibility for cable operators (from 5K to 1M subscriber serving areas) desiring “Greenfield” implementations for new VoIP services, or as an evolutionary migration path for high quality circuit and VoIP support.

Circuit Switch Migration to VoIP

SAFARI C³ makes it easy for cable operators currently offering circuit switched telephony services to elegantly migrate to newer IP delivered services. In this scenario (called “Cap and Grow”), SAFARI C³ will support all new subscriber voice traffic with VoIP, without disruption to current circuit switched traffic.

Primary/Non-Primary VoIP

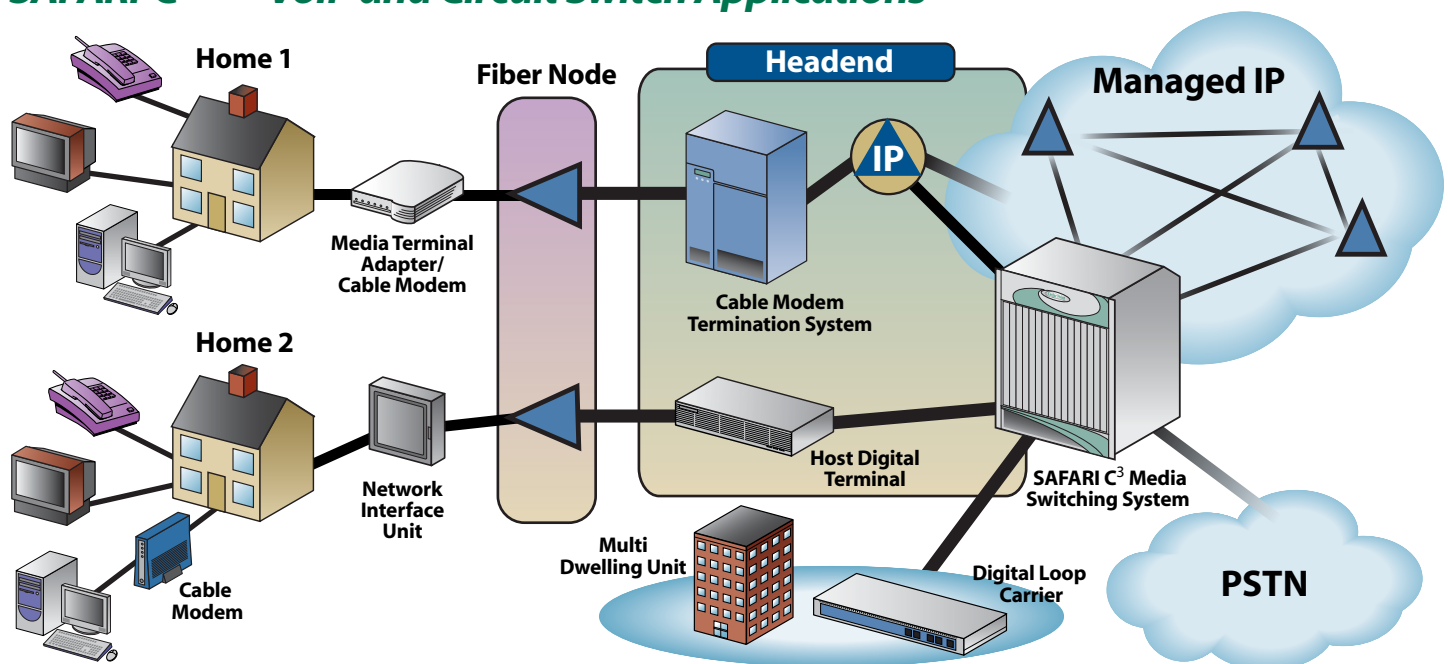
SAFARI C³ is a seamless, incremental upgrade for any DOCSIS 1.1 enabled networks. Once your cable plant has been fully upgraded to support two-way connectivity,

“We didn’t simply want to add pieces to the cable operator’s puzzle; we wanted to create a solution that fit into any new or existing cable telephony network, at a small incremental cost, which would provide a substantial new revenue source quickly, efficiently, and reliably.”

Mark Galvin
Founder & Chairman

SAFARI C³ can be added — without service disruption or system redesign — to get your business up and running with new voice services.

SAFARI C³™ — VoIP and Circuit Switch Applications



SAFARI C³ System Specifications

Physical Specifications

Dimensions (HxWxD)	24.5" x 19" x 21"
Slot Capacity	16 slots per shelf
Rack Capacity (7' rack)	Maximum of 3
Switching Fabric	80 GBPS

PSTN Connectivity

Interconnection Modes	GR-303, V5.X, IMT-SS7/European Variant of SS7, CAS E&M, ISDN
PSTN Interfaces	DS1/E1, DS3/E3, OC-3/STM-1
Echo Cancellation	G.168 (Up to 128 ms)
CODEC Support	G.711 PCM, G.729E, G.728, G.729AB, BV16
Fax/Modem Capabilities	Transparent Fax/Modem detect & CODEC negotiation

IP Connectivity

Signaling	MGCP/NCS, RTCP, SIP, SIP-T
Protocols	CableLabs® PacketCable™, AES, COPS, IPSec, DQoS, CMSS
Optical Interfaces	OC-3/STM-1 POS, OC-12/STM-4 POS, OC-48/STM-16 POS
Ethernet Interfaces	10/100 Ethernet, 1 Gigabit Ethernet

Redundancy

Power	Distributed, Dual Feeds
System Control & Switch Fabric	1:1
POS Interfaces & SONET/SDH	1+1
DS1/E1, DS3/E3	1:N
Network Interfaces	1:1
Timing	1:1

Synchronization

Sources	Primary & Secondary, Internal (holdover), OC-N/STM-N line timing Interfaces
Interfaces	DS1/E1 Dual BITS inputs/outputs
Internal Clock Quality	Stratum 3

Environmental

Cooling	Filtered, vertical forced air
Operating Humidity	5 to 90% (non-condensing)
Operating Temperature	0C to 45C
Power Input	-40V to -60V DC
Physical	NEBS Level 3, Zone 4

Network Management (SafariView™ EMS)

User Interface	Java-based GUI, CLI
Protocols	XML, SNMP

Voice Services

Feature Set	Residential and Small Business
Regulatory Features	Such as LNP, E-911, CALEA, Operator Interrupt

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