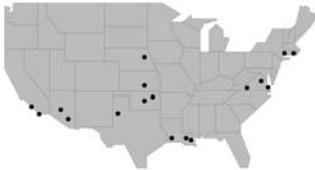


WHITEPAPER: Circuit Switch to VoIP Evolution Plan

INTRODUCTION

COX TELEPHONY MARKETS*



Cox Digital Telephone service is available to more than 6.5 million homes in Orange County and San Diego, Calif.; Phoenix and Tucson, Ariz.; Omaha, Neb.; Meriden, Conn.; Rhode Island statewide; New Orleans, Baton Rouge and Lafayette, La.; Oklahoma City and Tulsa, Okla.; Wichita, Kansas; West Texas; and Hampton Roads, Roanoke and Northern Virginia. Cox will launch the service in additional markets in 2005.

* As of February 2005. West Texas includes 5 geographically dispersed locations, including: Lubbock, Amarillo, Midland, Abilene and San Angelo.

Cox Communications has grown from a single-service cable television company into a multi-service broadband communications provider. Via its flexible and powerful broadband delivery network, Cox provides a number of communications and entertainment services, including but not limited to digital cable television, high-definition television, entertainment on demand, high-speed Internet and telephone service in most of its residential and commercial markets. Cox uses the power of its broadband platform to create multiple revenue streams, but also to create long-term customer relationships by offering bundled services to customers. Cox has had impressive penetration growth in these new services.

Cox's telephone business, in particular, has distinguished the company from its peers. In the mid 1990s, Cox began installing telecom equipment in select markets, preparing to capitalize on new business opportunities made available per the Telecommunications Act of 1996. Cox first launched local phone service in 1997 in Orange County, California. Today, Cox Digital Telephone has more than 1.2 million residential customers and more than 100,000 business location customers across 17 telephony markets. For two consecutive years, Cox received the highest honor in J.D. Power and Associates' Residential Local Telephone Customer Satisfaction StudySM in the Western Region (2003 and 2004). In a separate study, Cox's bundled customers nationwide ranked Cox highest for customer satisfaction in J.D. Power and Associates' 2004 Residential Long Distance Telephone ServiceSM study.

In Cox's whitepaper, "VoIP: Ready for Prime Time" (May 2004), the company outlined its telephone strategy and how Voice over Internet Protocol (VoIP) technology complements circuit-switch technology by enabling it to introduce phone services to new telephone markets without stranding the circuit-switch investments. It further stated "The company will not abandon its circuit-switched business. Cox will completely utilize the capacity of existing switches."

Further, Cox believes that VoIP provides an economically efficient method to support the exponential growth it is experiencing in its mature circuit-switch markets. This whitepaper will provide an update on Cox's successful strategy to leverage its installed base of circuit switches and migrate the growth in legacy telephone markets to a complementary VoIP overlay.

SITUATION

Fundamental to Cox's operational strategy for telephone service is its commitment to leverage the flexibility it has built into its network to remain a customer-driven, efficient and successful provider in the telecommunications marketplace. In doing so, Cox first embraced VoIP technology to deliver long distance traffic over its own IP backbone network. While originally built for high-speed Internet access, today Cox's national long distance VoIP solution is based on a converged packet core that successfully transports a growing number of its long distance customer calls via its national backbone, effectively reducing reliance on third-party wholesale providers.

As a successful telecom provider with impressive customer growth in 17 telephone markets (circuit switch and VoIP), Cox's telephony infrastructure today includes:

- **Circuit Switches.** Two dozen circuit switches provide primary line residential and commercial services in Orange County and San Diego, California; Phoenix and Tucson, Arizona; Omaha, Nebraska; Metro Hartford, Connecticut; Rhode Island statewide; Hampton Roads and Fairfax County, Virginia; New Orleans, Louisiana; Oklahoma City; and Wichita, Kansas.
- **Softswitches.** A softswitch provides primary line services via VoIP technology to residential and commercial customers in Roanoke, Virginia; Tulsa, Oklahoma; Baton Rouge, Louisiana; five cities in West Texas; and Lafayette/Southwest Louisiana.
- **Long Distance.** A VoIP long distance solution riding over Cox's national IP backbone connects all the circuit switch and VoIP markets together.

THE CHALLENGE

With five VoIP technology markets already commercially deployed and continuous growth in mature circuit-switch markets, Cox sought a solution that would enable it to move a high volume of new line growth over to VoIP in a rapid timeframe, allowing it to reap the benefits of lower capex while ensuring future growth.

Extensive modeling showed that evolving the existing circuit switches referenced above to simultaneously provide both Time Division Multiplexed (TDM) and VoIP support was more cost effective than overlaying new softswitches in TDM markets. The model also suggests that Cox would not have to reproduce interconnection and E911 facilities, rate center connections and back-office infrastructure. In some cases, SS7 links, associated infrastructure and connectivity to as many as 35 different rate centers would have needed to be duplicated.

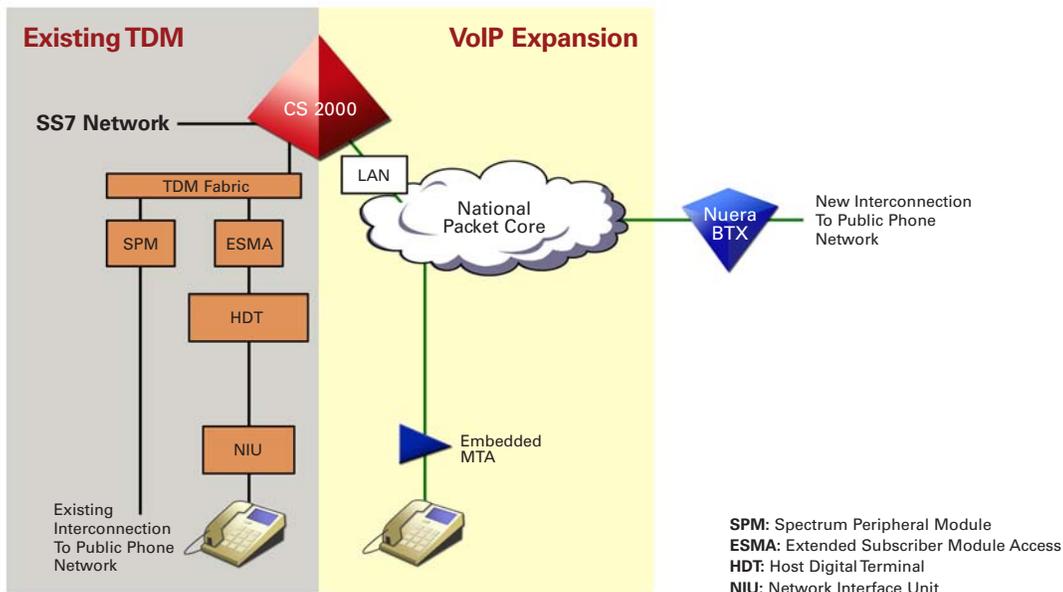
THE SOLUTION

In choosing to evolve the majority of its circuit switches to hybrid TDM/VoIP switches, Cox has opted to keep its TDM lines in place until migration is fully warranted. In doing so, Cox will add new lines on the VoIP side of the same processor. As a result, Cox can achieve the best time-to-market, leverage its existing processors and immediately realize the new economies of VoIP. Further, by upgrading at least 10 Nortel Digital Multiplex Systems (DMSs) to Nortel Communication Server (CS) 2000 hybrids, Cox expects to bring more than 50 percent of its new growth lines to VoIP by the end of 2005. Such growth will meet the increasing demand in the current Cox markets.

Nortel will provide Cox with a PacketCable™ compliant solution, including the CS 2000 platform integrated with Nuera Communications BTX media gateways. Nortel's cable VoIP solution will enable Cox to offer the same high-quality, full-featured telephony services that residential and business customers have come to expect from Cox. In addition, Cox will utilize the enhanced infrastructure to offer VoIP services to business customers over its metropolitan fiber assets by using integrated access devices to reach PBX connections. This deployment also positions Cox to add rich multimedia services in the future, further enhancing the communication capabilities for its customers.

Cox expects to realize significant cost savings as a result of this network migration. The PacketCable qualified VoIP solution will allow Cox to take full advantage of its existing network architecture and continue growing its network with VoIP while transitioning to a packet-based architecture throughout its network. The demonstrated capacity of the solution and strong scalability mean that, in the long term, Cox will be able to continue to grow the number of lines beyond even the largest circuit switch.

Circuit Switch to VoIP Evolution Plan



There are six steps which Cox and Nortel are following to implement this strategy.

1. Upgrade circuit switches to the required hardware baseline to support VoIP.
2. Upgrade core software to a VoIP-enabled load in an overnight process.
3. Add VoIP hardware components: media gateway controller blades and media gateways.
4. Establish connectivity to the VoIP-ready IP "bearer" packet network.
5. Reconfigure operating system applications to support VoIP, including provisioning and connectivity to network operations center for alarms.
6. Complete pre-In-service testing.

With meticulous preparation, the actual upgrade is transparent to subscribers. Further, it has no impact on the feature-rich solution and does not impose network affecting changes to external carriers, billing or routing. In addition, Cox's experience with the hybrid CS 2000 solution dates back to 2003, when a new switch was deployed for TDM line growth and a VoIP long distance solution.

The distributed architecture of voice over packet networks enables separation of the call control and signaling from the actual call switching fabric and bearer path to improve scalability and allow carriers to distribute parts of the network for efficiency and greater geographic reach. With a distributed architecture, Cox can locate media gateways and media terminal adapters (MTAs) remotely from call control and signaling resources. The combination of increased call server scale, greater geographic reach and distributed gateways enables Cox to enter markets at low initial line sizes, since existing softswitches can be shared across a larger number of sites.

CONCLUSION

In the near term, Cox has chosen to cap its Class 5 TDM investment and grow using packet technology, with 10 circuit switch to VoIP hybrid migrations already in progress. Some new telephony markets are planned to be served by the VoIP hybrid solution leveraging the geographic reach of the architecture.

For the long term, Cox will continue to evaluate the merits of a full conversion from circuit to packet to attain the basic operational savings attributable to packet technology, including reduced real estate, power, transport, line operations costs and operational savings from a simplified and/or flattened network.

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