

# Beyond Broadband

*In the United States, a new generation of competitive network operators plan to leapfrog beyond incumbents' 'broadband' service platforms. MITCH SHAPIRO, from Broadband Markets, examines the new technology, its economics, the new applications potential and the actors behind it.*

IN THE U.S. CABLE INDUSTRY, the term 'overbuilder' has long been used to describe a company that builds a second network to compete with an incumbent cable operator.

Historically, these overbuilds have been fairly rare and even more rarely successful. Today, however, a new generation of "broadband" overbuilders is emerging to challenge this longstanding pattern, a development with major implications for incumbents network operators, vendors, content and service providers and customers.

This new generation of network operators includes RCN, Western Integrated Networks, WideOpenWest, Seren Innovations, Digital Access, Carolina Broadband, Knology, ClearSource and Grande Communications.

Armed with fibre-deep networks, strong financing, experienced management teams and bundled-service business models, these next-generation broadband overbuilders aim to deliver more capacity and better service than either incumbent can match.

Though unwelcome news for incumbent cable and telephone companies, deployment of these new networks is likely to be viewed as good news by others: content suppliers seeking advanced high-speed access platforms, equipment suppliers seeking growth once the expected slowdown in cable upgrades begins, and customers hungry for more choice among service providers and for new and better broadband services.

A fundamental premise of these new companies' business models is that cable's HFC upgrades and telcos' DSL deployments cannot cost-effectively realize the promise of broadband: an integrated bundle of voice, video and data services, plus a range of new bandwidth-hungry multimedia applications, all available to every customer on a dedicated multi-megabit pipe.

While incumbents might dispute the extent to which this argument is true, there seems little doubt that the new architectures being deployed will be able to deliver much greater dedicated bandwidth than either DSL or "traditional" HFC networks.

A key question in evaluating the competitive threat posed by these new players is how the latent capacity of their advanced networks will be used to provide a compelling reason for high-revenue customers to switch from incumbent service providers to these new kids on the block.

Historically, companies trying to compete with an incumbent cable TV operator faced a simple, but harsh economic reality: a community in which 50-70% of residents purchased multichannel video service for \$30-\$35 per month could simply not support two competing facilities-based operators on a long-term basis.

To make matters worse, these newcomers, which in most cases could not offer customers anything truly unique, often focused on price competition, which added to the financial strains on both competitors.

Aside from municipal overbuilds – which often enjoyed some level of subsidy from a local government or municipal utility – very few overbuilds have survived as financially viable long-term players.

Even deep-pocketed local exchange companies have gradually backed away from a once extensive overbuild agenda. SBC has been a key player in this pullback, deciding to shut down or sell the overbuild operations of all three major LECs it has acquired. It first pulled the plug on the HFC networks being built by PacBell and SNET, both of which were intended to deliver a mix of voice, video and data and to become the next-generation network platform for these two LECs.

More recently SBC began seeking buyers for Ameritech's extensive HFC networks, which were more traditional overbuilds in that they were not designed to carry the LEC's voice service.

## Today's changing economics

Given this history, one might assume that building a competitive broadband network is today still a very questionable investment. But such thinking ignores the changing reality of today's markets and technologies.

For one thing, the revenue potential is far more promising for today's competitive network operators. In contrast to the \$30-\$40 per subscriber monthly revenue typical of traditional video-only overbuilders, these new players are offering service bundles that promise to generate \$100+ monthly revenue streams per customer.

The experience of RCN, a pioneer in delivering bundled services over a competitive broadband network, provides an early indication of this revenue potential. Since RCN began rolling out flat-rate "ResiLink" bundled service packages in 1999, it has experienced significant boosts in service penetration and per-customer revenue.

For example, six months after ResiLink was introduced in its first test market, Waltham (Massachusetts), penetration rates had reached 35% for local voice, 28% for cable TV and 11.5% for Internet service. After expanding the service to 90,000 homes during first quarter 2000, the average ResiLink customer was subscribing to more than three of RCN's services (video, Internet access and local and long-distance telephony) and generating average monthly revenues of \$125-\$130 compared to \$80 per month when offered on an a-la-carte basis.

Another factor in the competitive broadband economic equation is the increased financial vulnerability of cable operators, many of which have paid as much as \$4,000-\$5,000 per subscriber for recent large acquisitions. Only a few years ago similar systems might have sold for little more than half of today's price.

If we assume an average penetration of 65%, these per-subscriber acquisition prices translate into costs of \$2,600-\$3,250 per home passed. Depending on the status of the acquired network and its service offerings, the new owner might also incur costs of several hundred dollars more per home for an HFC upgrade, plus service-specific costs to deploy digital video, high-speed data and voice services.

These costs compare with the roughly \$500-\$600 per home targeted by today's overbuilders for construction of state-of-the-art broadband networks (not including customer premise equipment such as digital settops and cable modems).

This simple math suggests that, in some cases, a new network operator will invest only 15-25% of what its incumbent competitor has spent to acquire and upgrade its own network. And while the incumbent enters the competitive fray with video subscribers in hand and, in many cases, a first-mover advantage in the high-speed data market, this is no guarantee of long-term dominance in the rapidly evolving broadband marketplace.

## Western Integrated Networks

The history of Western Integrated Networks (WIN), an overbuilder targeting cities such as Sacramento and San Diego (California) and Austin, San Antonio, Dallas and Houston (Texas), suggests that at least one cable veteran prefers the new overbuild economics to a growth path involving acquisitions of existing cable systems.

WIN was founded in the fall of 1999 by Jim Vaughn, who last fall sold his former cable company, FrontierVision, to Adelphia Communications for roughly \$2.1 billion. This selling price equates to nearly \$3,000 for each of the company's roughly 700,000 subscribers, \$2,085 for each of the million homes its network's passed and roughly 14 times FrontierVision's 1998 cash flow.

At the end of 1998, a few months before the sale to Adelphia was announced, FrontierVision systems averaged 70% penetration, with an average capacity of 59 channels, average premium penetration of 41% and average monthly revenue per subscriber of \$33.84. At that time a third of FrontierVision subscribers were in systems with less than 54 channels of capacity, the average number of subscribers served per headend was approximately 2,720 and the company had just over 5,000 digital subscribers (less than 1% of total subs) and only 139 high-speed data customers.

In short, FrontierVision's systems were comprised largely of "classic" cable systems – small in size with relatively high basic service penetration but low premium penetration, limited channel capacity and modest per-subscriber revenues – that had barely begun positioning themselves to offer a full bundle of two-way broadband services.

If we include the expected cost to upgrade the FrontierVision systems, Adelphia will probably have paid \$2,220-\$2,300 or more per home and will likely need at least 2-3 years to complete this upgrade. The question then becomes how vulnerable these systems would be to a state-of-the-art overbuild that cost \$500-\$600 per home and that

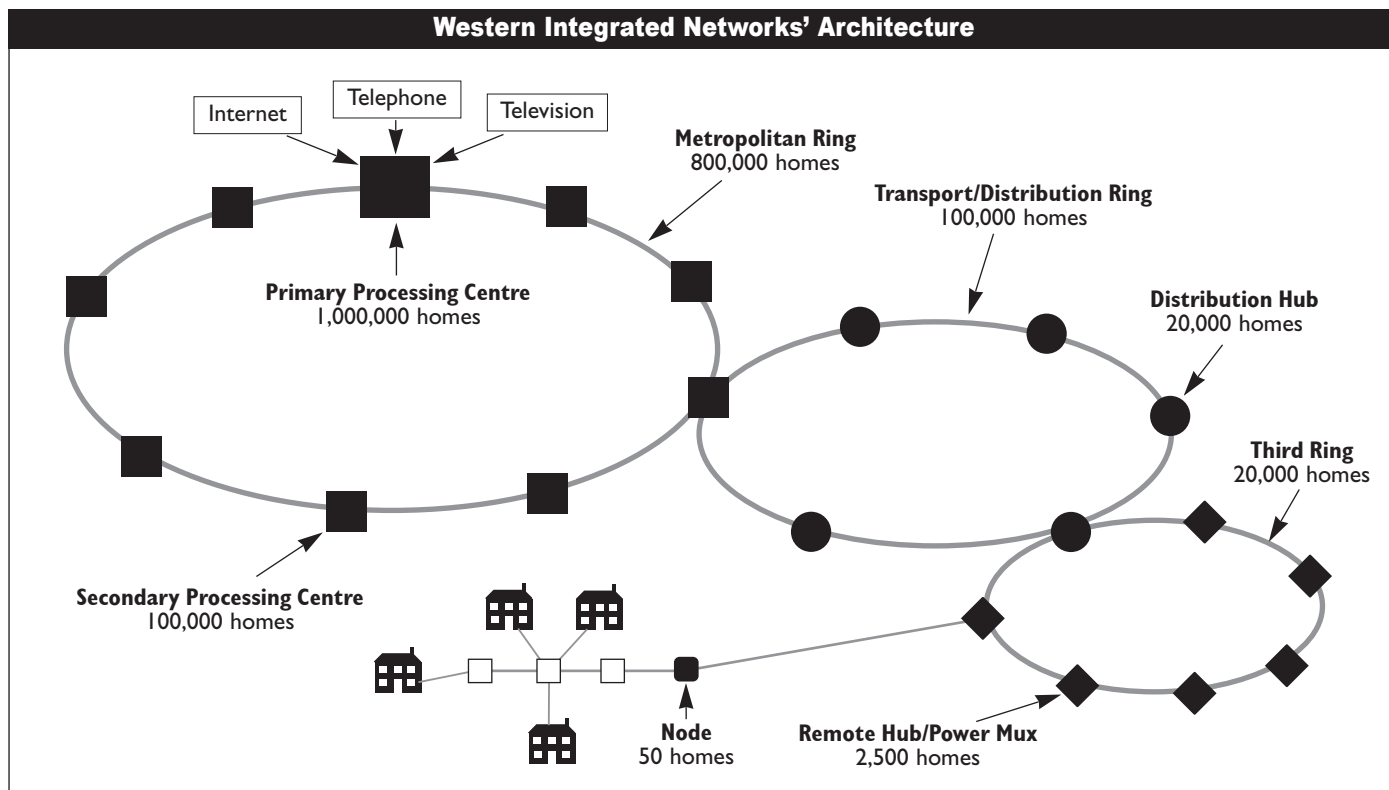
over time, to also capture increasing shares of incumbents' core business.

Incumbent cable operators most vulnerable to competitive harm from these new networks would be those that: 1) paid inflated acquisition prices; 2) have poor technical, marketing and customer service track records and; 3) have a difficult time integrating new acquisitions and managing network upgrades and new service launches.

Today, the service mix offered by RCN and other third network operators is comprised of analog and digital video, high speed data and local and long distance voice. Over time, these new operators (like incumbents) hope to augment this base with revenue from new digital services like video-on-demand, e-commerce, full-screen interactive and targeted advertising, energy management, security, videoconferencing, distance-learning and telemedicine.

In addition, today's third network operators are aiming for a strong market share in the small-to-medium business market, which today is not especially well served by either cable operators or LECs.

In such a future, incumbents burdened with legacy networks and services may find it increasingly hard to compete with newcomers



targeted FrontierVision's (now Adelphia's) high-revenue subscribers with an attractively priced bundle of voice, video, data and new digital services.

Or put another way, if these systems did face such an overbuild, how many bundled-service customers would each operator claim five to ten years down the road, how much would each of these customers be paying for these services and what kind of return would each operator be getting on their investments?

Though cable is arguably still the leader in bringing broadband to the masses, the rash of recent high-priced acquisitions appear to be premised on business models that don't account for the presence of strong "third network" competitors on top of the competition already present from DSL, satellite and, in some cases, wireless broadband.

The danger to cable – and to local exchange carriers – is that today's broadband overbuilders will deploy state-of-the-art networks that can deliver far greater capacity, functionality, reliability and value than can be supported by incumbent's legacy-laden networks and business models.

Discussions with third-network operators suggests that this "digital leapfrog" strategy is a major driver of their business models. To the extent it is successful, we could see these new broadband operators capture a disproportionately large share of new market growth and,

whose networks and business models are designed from the ground up to provide the most value at the least cost in an increasingly bandwidth-hungry, on-demand digital marketplace.

### Taking optical fibre deeper

A key component of the third-network "digital leapfrog" strategy is to deploy optical fiber closer to the customer than is typical of today's cable system upgrade, usually with plenty of spare fibre to support future growth. RCN, which began building its networks several years ago in high-density tier-one markets, is extending fibre to within 900 feet of customer premises, with each node serving about 150 homes and a minimum of 12 fibres terminating at each node (though only two are currently used).

More recent entrants into the third-network arena are planning to deploy even more aggressive HFC networks. As the graph illustrates, the WIN architecture will employ three tiers of interconnected fibre rings feeding fibre nodes serving only 50 homes.

In anticipation of an eventual migration to fibre-to-the-home, says Vice President of Engineering Dave Heyrend, WIN is installing enough fibres to each node to provide a dedicated fibre strand for every home passed. Heyrend says the network will support delivery of at least 10

megabits per second to each customer.

Another newcomer, Grande Communications, plans to build 11,000 miles of broadband plant in the I-35 corridor linking the Texas cities of Round Rock, headquarters of Dell Computer, Austin, San Marcos, New Braunfels and San Antonio.

With the goal of offering analog and digital video, lifeline telephone service and 10-40Mbit/s of dedicated bandwidth to its customers, Grande is deploying Marconi's DISC\*S fibre-deep access platform.

The DISC\*S platform takes fibre to ONUs serving just 24 homes. And though it can deliver today's mix of voice, video and data services on a single fibre, Grande will deploy a minimum of eight fibres to each ONU to insure sufficient capacity for whatever new services might develop in the future.

With Grande adopting the fibre-deep Marconi architecture, the likelihood increases that its sister overbuild companies, Knology and ClearSource, may do the same (the three companies share some common investors and board members and Grande Vice Chairman and CEO William Morrow previously held the same position with Knology).

To date, the latter two have been deploying fairly traditional HFC networks in relatively small markets, with Knology focused in the south-east and ClearSource active in smaller but fast growing Texas cities. Likely candidates for further DISC\*S deployments within the Grande/Knology/ClearSource family of companies would appear to be the two larger cities targeted by Knology in Tennessee – Knoxville, where it won a franchise early this year, and Nashville, where it has applied for one.

### New network partners

The rise of these new fibre-deep networks provides opportunities for companies with compatible technologies and business models that can support their digital leapfrog strategies. One such company is Advent Networks, based in Austin (Texas), a fast-growing, high-tech city targeted by both WIN and Grande (see box on the right).

Advent's patent-pending "Ultraband" access platform uses proprietary technology to deliver 10-40Mbit/s and more of dedicated capacity to each customer. Advent uses the term "UltraBand" to distance itself from cable modem and DSL offerings, which claim to deliver "broadband" services, but in most cases actually provide average per-customer data rates well below 1Mbit/s.

Advent's business model is complementary to those of the new overbuilders in several respects. First of all, its technology and service platform is designed to take maximum advantage of the fibre-deep networks these companies are deploying.

Secondly, by working with content and service providers to develop applications that leverage the Ultraband access platform, Advent can help overbuild partners fill their ultra-fat pipes with new revenue-generating services and capabilities that incumbents will be hard-pressed to match.

A third component of Advent's third-network partnership strategy is its relationship with Southern Union Company, an electric and gas utility with an 11% equity stake in Advent and an interest in partnering with companies building state-of-the-art broadband networks.

Among other things, utilities can contribute rights of way, existing fibre networks, construction expertise, billing systems and strong customer relationships to a competitive broadband venture. RCN, for one, has acknowledged this value, having partnered with local utilities to build its networks in the Boston, Washington, DC and Los Angeles markets.

If one looks backward in time, it's easy to argue that third network ventures are, by definition, losing propositions. But if one looks ahead to a new era of bundled broadband services and insatiable bandwidth appetites, the prospects of next-generation network builders begin to look considerably brighter.

Facing incumbents burdened by legacy networks – often paid for at premium prices—these new kids on the block are positioned to leverage best-of-breed technologies and innovative business models to carve out a leading role and a significant market share – in the digital future.

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### The Ultraband Edge

ACCORDING TO ADVENT NETWORK'S co-founder and chief operating officer David Fruhling, the main value Advent brings to the new network builder is the ability of its Ultraband service platform to offer a truly compelling reason for a consumer to switch away from an incumbent.

In a bundle of video, voice and data, says Fruhling, data is the most powerful driver of that bundle. Delivering the "killer apps" that customers want and that legacy broadband technologies can't deliver is critical to these new network builders, he contends. Armed with a set of uniquely compelling Ultraband services, he suggests, these new operators will be able to achieve higher penetration rates, capture more high-value customers and reduce churn.

Without such services, these new players risk being viewed by customers as just another "me-too" service provider lacking a strong basis for differentiating themselves from the incumbents. In the latter case, winning and keeping subscribers and building per-subscriber revenues is much more likely to be an uphill battle.

Services that a 40+ Mbps Ultraband network would be especially well equipped to deliver include HDTV-based video-on-demand services which, at data rates up to 20Mbit/s, would put huge demands on network bandwidth.

Another is an interactive video-rich navigational "portal" through which subscribers would enter each time they turn on their TVs or PCs.

Others include targeted interactive advertising, video shopping, multimedia libraries, videogames and videoconferencing, each with the ability to support full-screen high-resolution video and high penetration and usage levels.

Paul Palumbo, an industry analyst focused on digital content and founder of Webcast Track, an interactive media research service, sees an Ultraband network having key benefits for companies developing and delivering digital content. Among these is the potential for more frequent access of video streams by each user.

As an example of how network capacity can impact this measure, Palumbo estimates that today's average broadband user accesses about four video streams per month. This 400% monthly usage rate compares to an average of roughly 30% for narrowband users.

With far greater capacity than today's broadband networks, Ultraband operators and their content providers would be positioned to achieve even higher video stream usage rates.

Other benefits cited by Palumbo include:

- increased ad inventory and impressions delivered, which means greater investment returns on programming;
- greater reliability and more consistent quality of delivered streams;
- greater "length of view" (i.e., people staying connected to sites and brands for longer periods of time);
- an increase in the connect-time revenue per hour, which now averages about \$3.50-\$5.00 in hybrid narrowband/ broadband environments);
- improved distribution opportunities and exhibition windows for Internet Protocol pay-per-view content supplied by movie studios, which often have IP PPV "quality" requirements;
- an opportunity for IP streaming, now limited to the PC, to migrate to the living room and onto the TV.

Palumbo's last point highlights the potential that Ultraband-class networks have to transform the TV set into a networked multimedia platform that marries high-resolution video with full interactivity.

Given that the typical U.S. cable household watches 8.5 hours of television a day and that nearly half of the country's homes still do not own a modem-equipped PC, those companies best able to mine this undeveloped "advanced TV" market potential could have a powerful edge in the future battle for broadband dollars.