

From Intelligent to Irrelevant Networks

A teenager sits in front of his computer screen, engaged in an instant messaging conference with friends and relatives around the world. A cousin participates from his mobile phone, a girlfriend is in the school library. Questions are sent to parents about dinner plans. The teens agree to meet (on-line, of course) for a computer game while music files are exchanged in the background. Six people have been involved in this session, with six different network providers and terminal types.

Their choice of terminals was made without regard to the network; the network providers had been selected without even conceiving that such a messaging session could take place. The home-based teens used high speed internet access from their phone company in one instance and from their cable company in the other. The third teen connected via their own pre-paid mobile service in Europe. The parents were connected by office LANs and WANs and mobile PDAs.

These teenagers are unknowingly demonstrating the increasing irrelevance of the network: the evolution from Intelligent Networks to Irrelevant Networks. As terminal devices become smarter in their own right and networks evolve to a unified IP standard, users have less of an interest in the provision of network intelligence. Indeed, the migration of intelligence to the edge of the network means that user applications are finding increased levels of network transparency: the choice of network is expected to be irrelevant by most applications. Over the past five years, users began communicating without the active involvement of communications carriers!

A Brief Perspective in Time

The first telephone exchange, introduced into Hartford Connecticut in 1877, was the first implementation of centralized, intelligent routing. The central processor at that time was a bank of human operators. In 1891, the first automated telephone exchange began a move to put routing control into the hands of the user. With the invention of the rotary dial phone, users controlled each step of the call. Every click from every digit dialed moved the call closer toward its destination. User control reached its apex in 1951 with the introduction of Direct Distance Dialing – long distance calling without operator intervention.

In the 1930-1950's, electromechanical, common-control switches were introduced, beginning the return of intelligence to the core of the network. The 1963 introduction of tone dialing allowed users to signal network processors in the middle of calls for advanced features.

The mid-1980s through year 2000 marked the pinnacle of centralized network intelligence. Voice networks began to offer services with routing decisions powered by centralized databases. Users traded private business exchanges for telephone company Centrex, in order to outsource the management of complex features and to automatically access the latest software upgrades. The core of the networks became the centres of power – not only were telephones made dumb, the primary local telephone exchanges do not even know how to route certain types of phone calls, such as toll-free "800" numbers or local competitors' calls, without assistance from a central routing database.

Yet, regional and national control of routing and network intelligence was not seen as sufficient to meet their users' needs, since high quality global connectivity was a rare commodity. At great cost, global alliances were created to leverage the premiums associated with the long-haul bottleneck. Most of these alliances have come crashing apart, as international cultures clashed. Global One, formed from Sprint, France Telecom and Deutsche Telekom, and Concert, anchored by AT&T and British Telecom, are two examples of failed alliances. In the case of Concert, \$7 B (U.S.) was written down by AT&T and BT, coupled with 2,300 jobs lost. Other companies, from Worldcom to 360 Networks, Qwest to Global Crossing, chose to control their own destinies, with equally dismal results. Billions of dollars of investor capital have been lost in search of the elusive recipe to satisfy multi-national customers.

The Democratization of Network Intelligence

Partly due to the low cost of powerful microprocessors and in part due to very low cost global bandwidth, a return of intelligence to the edges of the network has been underway. Aided by a migration from various circuit switched protocols to a more uniform Internet Protocol (IP), networks witness a democratization of network intelligence, supplanting the supremacy of network providers. With self-actualizing interconnectivity, IP services will be able to more easily operate across disparate networks. This leads to an interesting ironic result: the emergence of a "network of networks" model of communications connectivity will lead to the supremacy of local access providers, rather than global network carriers.

The customer carrier selection criteria in the future will be in the provision of "on-ramps" rather than the highway itself. Once a user has gained high-speed access onto the backbone network, their bits will flow in blissful ignorance of the underlying carriers and infrastructure, with a presumption that the only other bottle-neck of interest is at the distant end of the communications link. A gigabit Ethernet access connection has very limited value if the ISP does not provide gigabit connectivity to the Internet cloud as well. Due to the low cost of long haul capacity, successful carriers will be able to meet expectations of highly available, robust interconnectivity at major internet exchange points.

While carriers are spending billions of dollars differentiating their global network solutions, customers are acquiring edge devices that encourage network transparency, enabling users to become more carrier-neutral. As customer premises equipment continues to be more intelligent, customers gain independence. In effect, Internet Protocol may be seen as a universal protocol. Electrical appliances are sold to consumers without knowledge of the supplier of electricity. The universality of IP allows communications based appliances to be used and "plugged-in" without knowing the supplier of telecom services.

To the dismay of the leviathans of the industry that created networks with vastly improved overall quality and with expanded and optimized connectivity, customers actually lose their need to be bound to their carriers. Instead, customers may be able to select local niche providers and turn to their supplier of IP terminal equipment for global one-stop support. It may be that carrier investment has led, not to a competitive advantage in possessing resources, but rather in the commoditization of the resource itself!

Service Provider Implications

For the purposes of this article, we look at an expanded definition of service providers. In the near future, we see the potential for systems integrators, network and business process outsourcers and customer premises equipment or system suppliers to expand

their offerings to include communications services. In the near term, we believe opportunities exist to acquire massive long haul capacity from insolvent or nearly insolvent global carriers. A return to more traditional pricing models is likely to meet resistance caused by the current capacity glut and the debt burden that overhangs virtually all industry participants. Until these factors are resolved, the value of long haul infrastructure and bandwidth services will remain low, with a resultant diminished barrier to entry.

Commodity Bandwidth Services

The implications of the Irrelevant Network theory are far-reaching. Global carriers have invested billions of dollars expanding their own capabilities and capacities to serve multi-nationals. In some cases, global alliances have been built; in other cases, under-sea fiber optic cables have been laid. Thanks to advancements in opto-electronics, some estimates suggest that there is more than 20 years of global capacity already available. In effect, it is precisely the rush to build capacity that created an oversupply, which in turn has created the irrelevance of networks.

While carriers are wrestling with the danger of commodity pricing for bandwidth services, they have sought to move up the value chain and are increasingly facing the threat of non-traditional providers of managed services. Local access is now the critical bottleneck service in the provision of IP connectivity. Indeed, reliable and robust local access is the only communications service that clients typically find as a bottleneck in serving their requirements. Since local access services were rarely provided by the global carrier itself, many multi-national customers may have been frustrated in looking to a global carrier for provision of their integrated services. As a result, customers may become equally likely to look to their customer premises supplier (eg. router or IT infrastructure provider) for global communications support. Given the interaction between software applications and the communications protocols, customers may look to their systems integrators for one-stop shopping, further exacerbating the commoditization by aggregators and value added suppliers and bundlers of software and communications services.

Billing, Bundling and Single Point of Contact

The attraction of single billing may be somewhat mythical – while single billing sounds good in theory, it tends to provide less than ideal results when implemented.

Smaller customers, when receiving bills for their total communications services (e.g. local and long distance phone service, coupled with data and mobile service) begin to question the size of the bill and look for ways to lower their costs. Many small business and residential customers already have monthly charges applied to credit cards in order to write fewer cheques or benefit from the cash flow management of their bank in any case.

Larger businesses generally want their bills broken down by department or cost centre in any case – meaning that they want more bills, not just one. As certain customers buy on a global scale, there are limits to the usefulness of single points of contact for purchasing. Most often, billing is sought in local currency since charges must be accounted for as incurred by the local business unit. Such customers are as likely to want to know the local representatives for trouble escalation. Billing is likely required in local currency because the costs are incorporated into the local unit's profit and loss statements.

So, while many customers are certainly after the discounting associated with spending more money with a single carrier (ie. bundling and bulk purchase discounting), it is not clear exactly who, if anyone, is asking for a "single bill."

With low commodity pricing from a number of industry participants, increasingly, corporations are purchasing communications services in the same manner as other goods and services, with pressure on pricing and service performance.

The benefits of local network optimization may prove to outweigh any benefits of single billing. Coupled with the increased commoditization of communications services pricing that may remove specific financial incentives for bundling, other non-traditional channels may help customers to derive the lower costs with better overall control of service quality.

The key differentiator may be found in customer service: providing points of contact to match the requirements of the buyer. Winning service providers, whether carriers or systems integrators, will be those that can match user requirements for supplier interaction – ordering, moves, adds and changes, performance monitoring, trouble reporting and billing. These interactions are captured under a banner of managed services.

Managed Solutions

Carriers are attempting to provide global managed services to their clients in an attempt to “move up the value chain” away from commodity bandwidth services. Such management includes single points of contact, service level agreements and guarantees, monthly reporting, storage and server hosting, among other services.

Customers may be somewhat skeptical about the carriers’ abilities to deliver on these services. In some cases, carrier sponsored data hosting is at odds with an ability to have diversity. Carrier diversity may be required for serious high-availability applications and in order to maintain leverage for service and pricing responsiveness.

In addition, applications continue to increase in complexity, which challenge the ability of a carrier to provide complete outsourced communications management. To the extent that applications interact with communications protocols, such as with non-IP based legacy networks, such as Frame Relay, SNA or ATM, carriers will be unable to fully diagnose failures, without the participation of the systems integrator. Complexity may paradoxically be increased during the transition to an IP network as formerly stable networks are reconfigured to adopt lower cost IP-based communications links.

As a result, customers may look to their IT infrastructure providers to act as the prime contractor for communications services. Carriers may find that their competition is coming from less traditional channels.

Summary

In the era of Intelligent Networks, carriers spent their resources developing and promoting the core network. Global alliances helped to extend these capabilities to provide “seamless” services to customers everywhere in the world. With the migration of intelligence to the edge of the network, core network capabilities may become less relevant: users will provide their own capabilities through applications resident on their own equipment. As a result, customers may have become more concerned about local service issues rather than global services.

The global telecommunications industry is in the midst of a painful restructuring, working through massive levels of long haul overcapacity and the burden of debt. Its traditional value chain has eroded and carriers are searching for new formulae for success.

In the coming era of Irrelevant Networks, service providers need to focus on achieving greater excellence in the provision of local access, rather than global services. Customers will challenge communications providers seeking excellence in customer support, excellence in network performance reporting, excellence in guaranteed quality access transport services, with measured availability and well-managed throughput and inter-connectivity to multiple major network backbones and interchange points.

It is possible that competition for carriers will come from providers of IT infrastructure, which may seek to provide managed network services as a means to increase the value they bring to their clients. Such challengers may serve as resultant opportunities for partnerships, extending the managed network service capabilities of carriers and providing development resources for customer and applications support technologies. As customers become more empowered to control their own networks, success will come from being seen as the very best local supplier, allied with similar minded technology providers.

In an era of Irrelevant Networks, the winners will be customers. Customers will be better served by competition to provide managed services. As intelligence increasingly migrates to the edge, customers benefit from increased empowerment and choice.

In the near future, will carriers recognize and respond to their potential for network irrelevance, in order to succeed in meeting these changing customer requirements?