SUBJECT: ROCOM OBJECTIVES

Red Oak Iowa organizations and residents rely heavily on telecommunications technology and agree that it is critical to their business and to their life style. Action is necessary to meet the needs for voice, data, and video digital technology, at rates competitive to metro area, and comparable service. To that end:

1. Encourage current and prospective telecommunication providers to offer and/or increase ATS (Advanced Telecommunications Services) (see note C), such as:

1.1 Infrastructure (e.g. media - buried cable or premises media, wireless data and voice equipment, colocation facilities, LAN (Local Area Network), MAN (Metropolitan Area Network), and WAN (Wide Area Network) equipment.

1.2 Delivery & Service (e.g. computer hosting services, voice & data wireline and wireless services, data transport services);

1.3 Content (e.g. education, government, health, business, ag, entertainment).

2. Assist the community – residential and organizational, with ATS. For example:

2.1 Educate the community on telecommunication choices on a continuing basis.

2.2 Assist the community in defining and communicating their ATS requirements (whether infrastructure, delivery & service, and content) to the appropriate provider.

2.3 Assist the community in developing and utilizing ATS.

3. Determine the economic feasibility (note C) of the establishment of either or both of the following telecommunication for-profit entities. That includes examining the extent of demand from potential customers to utilize the overbuild infrastructure.

3.1 "Overbuild" profit center (note A)

3.1.1 Examine whether to construct, maintain, and operate any or all of the three following general service categories, within an Overbuild profit center:

3.1.1.1 An optical fibre MAN (Metro Area Network)telecommunications transport infrastructure, comprised of:

a) ACCESS, which is the interface terminal at the subscriber premises.

b) AGGREGATION, which combines traffic from interface terminals at a campus, neighborhood, or multi-tenant building.

c) CORE, which combines traffic from aggregation points, onto a common multi-service network.

Some characteristics of such a ROCOM transport infrastructure:

a) Optical unbundling, QoS, and SLAs supported at OSI Layer 1.

b) No OSI Layer 3 interaction between service providers and ROCOM.

c) ROCOM should not furnish IP addresses to subscribers.

d) Protocol and bit-rate independent; bandwidth scalable.

e) Provide network capability for 1) management network; 2) out-of-band network.

f) Where network architecture redundancy is required, utilize physical and virtual mesh topology, in addition to, or in lieu of ring topology.

3.1.1.2 A MSAP (Multi Service Access Point). Some characteristics of an MSAP, which essentially offers management over the infrastructure:

a) ROCOM offers infrastructure support at the Data Link layer - Layer 2. For example, by offering service providers VLAN (Virtual Local Area Network) over Ethernet.

b) ROCOM offers infrastructure support at the Network layer - Layer 3. For example, by offering service providers MPLS (Multi-Protocol Label Switching)-based VPN (Virtual Private Networks).

c) True managed services are those where previously manual task are automated & monitored, in some cases remotely, in a proactive fashion. The set of managed services can also include the design of hardware and software, and implementation of computer systems.

Managed services might be categorized into three services:
1) Transport, e.g. LAN/WAN services utilizing lease lines, frame relay, ATM, IP, Internet.

2) Applications, e.g. security, storage, conferencing, web hosting, VoIP.

3) Professional, e.g. network planning, assessment, design, implementation, monitoring, and management. CPE management.

d) Hubs provides exchange and access points for community and regional carrier interchange service and service/content providers. Colocation and managed hosting can provide fault-tolerant services.

e) Disaggregates local and regional information services from Internet access, thereby reducing traffic on and fees paid to national carriers, while increasing traffic speed among local and regional users. Also, provide networking provisioning and carrier-neutral packet-switching facilities

f) Facilitates entrepreneurs in marketing new information services and content to local customers without incurring cost of a backbone Internet feed. This also facilitates keeping money in the community, rather than sending it to remote computer host firms.

g) Reduces cost to establish and maintain data and telecommunications services by providing facilities and trained personnel for management of (content and service servers, directory and routing services, voice and data switches, mail switches, mail servers, security, data backup and storage, etc), and “exchange” infrastructure connecting to regional and backbone carriers.

3.1.1.3 Examine whether to establish a NSP (Network Service Provider) entity. Some characteristics of an NSP, for Red Oak:

a) Capable of offering bandwidth of at least symmetric 100 Mbps to all premises.

b) Provides network-connectivity services between subscribers and service providers. Services might include network security, quality of service, managing the distribution component (e.g. Managing the customer premise equipment for service providers, providing either or both OSI Layer 2 and 3 switching (e.g. Ethernet).

4. "Switching" profit center (note B)

4.1 Examine the extent of demand from potential customers, as to whether it is economically feasible to create an entity providing various types (note C) of retail services, such as Service Portal, Application Service Provider, Managed Service Provider, Internet Service Provider, Content Provider, Carrier (wireline and wireless).

NOTES

(A) "Overbuild" profit center - Red Oak & environs telecommunications transport infrastructure (that is, distribution system & subscriber physical plant services).

There are three general service categories within the Overbuild profit center:

1) Fibre telecommunications transport and access infrastructure.

2) MSAP (Multi Service Access Point) – network (Overbuild and colocation management).

3) NSP (Network Service Provider) – provides network connectivity between service providers and subscribers.

Overbuild is a non-discriminatory, open access, provider neutral, bandwidth transport pipe, encouraging the maximum number of service & content providers, thereby facilitating the delivery of the greatest variety of ATS at the lowest price to subscribers. This is applicable to all types analog & digital data - broadband, voice, broadcast TV, wireless.

Overbuild is guided by needs of the data, not design assumptions of the network.

ROCOM supports the FCC Policy Statement (05-151) dated 05 AUG 2005, outlining their jurisdiction to ensure that providers of telecommunications services are operated in a neutral manner. Specifically, the policy statement reads:

To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet,

(a) consumers are entitled to access the lawful Internet content of their choice.

(b) consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.

(c) consumers are entitled to connect their choice of legal devices that do not harm the network.

and

(d) consumers are entitled to competition among network providers, application and service providers, and content providers.

Such a service provider might offer extraordinary security & storage to the banking sector, for off-site disaster recovery of mission-critical data. Another example might be an enterprise-focused content-delivery provider with the capacity to offer outsourcing the content management of documents and media. A third example of such service providers are VNOs (Virtual-Network Operators), which provide integrated telecommunications solutions to telcos and enterprises, comprised of end-to-end management of multi-vendor, multi-service networks, SLA management, customer care and billing, provisioning, etc; one specific example being VPN (Virtual Private Network) (note C) over public or private networks.

The existence of Overbuild does not necessarily depend upon the existence of “Switching”. If Overbuild provides retail services or content, there is a potential of actual or perceived conflict of interest with those providers interested in offering such services to end-users on the Overbuild access facilities. A non-discriminatory access provider profits from the maximum movement of traffic, thereby offering end-users a greater number of service choices, at lower prices, than a discriminatory access provider. The latter maximizes profits by ensuring that its proprietary content moves first and fastest, while competitor's traffic moves last and slowest, if at all.

An open access transport telecommunications network is based upon three principles:

1) Infrastructure. The highest potential of the network will be achieved not by the accomplishments of network owners but by what creative users and developers can do with a fast and reliable connection between every human on earth.

2) Neutrality. To reach its highest potential, a communications infrastructure must not discriminate as between uses, users, or content.

3) End-to-End. The greatest rate of technological development is driven by delegating decisional authority to the decentralized “ends” of any network.

Examples of how organizations might utilize solutions offered by an NSP:

Carriers

- enhanced network quality and expanded business scope through effective peering (note C) capabilities.
- establish direct connections to interconnection facilities, in order to increase access to new customers.
- highly scalable connections enhance load balancing and data synchronization.

Managed Service Providers

- cost savings for high bandwidth connections.
- cost savings by paying for bandwidth needed and no more.
- expand business by reselling Overbuild services.
- protect against outages by deploying redundant circuits efficiently.
- deliver data synchronization & load balancing between service facilities.

Internet Service Providers

- reduce expenses through peering arrangements with other ISPs.
- expand business by reaching more customers through interconnection facilities.

- secure, redundant connections offer backup to primary circuits.

- rapid connections to long-distance providers.

Application Service Providers

- expand business through easy connections to ISPs.

- connect multiple data centers to create a cost-effective infrastructure.

- easy connections to customers and, in turn, their customers to offer services.

Content Providers

- cost savings by easily adding redundant connections.

- easy connections to ISPs to reach customers.

- establish private connections with other content providers.

- connect various data centers to reach end-customers and expand the business.

Business plan TBD. In general, a wholesale OSI Layer 1 (note C) provider, offering UNE (Unbundled Network Elements) (note C) to retail service providers. Also, consider offering OSI Layer 2 (note C) services, utilizing OSS (Operational Support Systems) to manage a multi-vendor, multi-technology network for the benefit of retail service providers. Layer 3 (note C) bandwidth-on-demand services might also be offered.

Service Level Specifications might include being able to model the physical and logical topology of the network, automatically gathering information from the network to reconcile the intended and actual states of the network, and tracking demand for services & capacity. An objective is to implement granular control over the infrastructure such as admission control, determining whether new service demands can be met without compromising existing Service Level Agreements, traffic shaping and class-of-service marking, & bandwidth management.

The open access model is similar to building and maintaining roads in a community, that is, the model reduces the market entry costs for new and existing telecommunication providers. Since the open access model allows for more than one retail provider of any particular type of service (voice/data/video), if a consumer does not prefer a particular provider, that consumer has the choice of other providers, on the same network, thus Overbuild should not lose revenue. Regarding the establishment of an NSP, some representative solutions which might be offered organizations include:

OSI Layer 2 basic Ethernet services, and L3 services such as IP VPN (Virtual Private Network) (note C) and firewalling.

Transparency – enterprises should not be forced to change L2 (such as VLAN (Virtual

Local Area Network) & L3 (e.g. IP addresses) configuration of their LANs.

Quality of Service – CIR (Committee Information Rate), EIR (Excess Information Rate), priority service, and protection levels are often expected by enterprises.

Customized services at low cost - bandwidth can be tuned, on a as-needed basis, without changing the interface card of the access device.
Ease of use – accommodate both L2 and L3 switches and routers.
Examples of open access telecommunication providers:

*** In 1984, AT&T was structurally separated into wholesale services, competing with numerous long distance providers,& retail RBOCs. The RBOCS were ordered by the 1996 Telecommunications Act to provide network equal-access to CLECs (Competitive Local Exchange Carriers).

*** Summerside PE, Canada: the municipal utility constructed and maintains a communications network - fibre to businesses and wireless to residences. The network "…is on an equal access basis to any suppliers because competition will ensure residents get the widest range of services at the best prices….".

*** OnFiber Communications operates "vendor & technology neutral" fibre networks in 12 U.S. metro areas, offering Ethernet, optical wavelength (note C), and SONET connectivity. "Customers are free to choose the service that fits their needs.".

*** In 2001, BT (UK) voluntarily separated into wholesale and retail units, in order that "…management will be better able to focus on the different tasks of achieving continued growth in the two, distinct markets…[although BT] should be concentrated primarily on the wholesale business.". For six months ending 30 SEP 02, wholesale achieved 16% operating profit (revenue minus all cost & expenses including interest, depreciation, capital expenditures, but before taxes) based on revenue, and retail achieved 12%. Revenue for the six months for the two BT units was US$18B. The result of the structural separation, according to Vern Kennedy, CEO of Broadview Networks, is: "Local calls are among the least expensive in Europe, competition is robust, and service is among the best in the world.". On 18 NOV 2004, the Office of Communications (UK) issued proposals to require further organizational separation between BT Wholesale and Retail, as the regulator believes BT Wholesale does not treat it main customer, BT Retail, in the same way as Retail's competitors. The regulator believes such strict separation is needed for competition.

*** FiberTech Networks constructs & operates "open access" fibre MANs in 12 US cities, expanding to 50 eastern US cities. They provide "carrier-ready" dark fibre to telco carriers, corporate, education, health care, & government agencies.

*** PPL Telecom provides a "carrier neutral" OC-192 WAN & MAN network in eastern PA, furnishing wholesale fibre cable access to voice and data resellers, ISPs, & directly to large organizations. GbE and SONET services are also offered.

*** Progress Telecom constructs and operates a "wholesale only" WAN and MAN 16,130 km fibre network, serving the eastern US (NY to FL). Services include T1 thru OC-192 transport, GbE, SONET, optical wavelengths, colocation.
*** FPL FiberNet provides "wholesale only" dark fibre and bandwidth capacity leasing throughout their 3,900 km network in FL.

*** AGL Networks constructs & operates "vendor and technology neutral" fibre networks in Atlanta GA & Phoenix AZ. AGL also leases dark fibre, provides colocation, and inside customer premises cabling & conduit construction & management.

*** Copenhagen Denmark: the country's largest electrical utility, NESA, has contracted to begin overbuilding with fibre to 200,000+ homes and businesses. "NESA will not offer any services over the network itself… [t]he end-user will have multiple services to choose from in a competitive environment, ensuring that quality & costs are optimized.".
*** NOANet in the NW US has constructed and operates a "wholesale only" 6,000 km fibre backbone, providing TDM circuits, IP transport, and GbE over SONET. The network principally serves rural areas.

*** Douglas County WA PUD (Public Utility District): constructed and maintains an "open access" fibre network. Wholesale services: colocation, dark fibre, & lit fibre (Ethernet, TDM). Connected to the NOANet backbone.

*** Okanogan County WA PUD: constructed & maintains a 130 km "open access" fibre net, connecting to NOANet backbone. Chelan County WA PUD: constructs & maintains an "open access" fibre net (currently passing 2,500 premises), connected to NOANet, with 14 voice, data, & video providers (predominantly locally owned and operated). They offer their services directly to end-user customers, over the network (the PUD invoices the retailers for network usage).

*** Anaheim (CA) PUD installed a 96 fibre cable loop to government and business locations in 1996. The network is open access, to "Ensure universal access and interconnectivity,…".

*** Grant County WA "non-discriminatory" network (Zipp) has a 42% take rate among 9,500 passed premises. Zipp supports 15 ISPs, 2 TV providers, 2 voice providers, 1 security system provider. "Open access & non-discriminatory pricing is essential to enable service competition. Independent retail service providers are more responsive to short-term competitive change. Distribution only, no end-user services.". Zipp is an "enabler", not a "competitor". Retail service providers pay ZIPP directly for network usage, for example, $10/month for one POTs line use, $15/month for 1 Mbps, $20/month for 10 Mbps.

*** Ashland OR: the municipal utility (AFN) constructed an "open access" network. "Rather than compete with the local, private [ISPs], AFN instead partnered with them & gave these independent businesses access to broadband technology.".

*** Stockholm Sweden: the municipality constructed and maintains a city-wide fibre network, leasing only dark fibre, and functions "…independently of the operators providing services on the telecom market.".

*** Alberta Canada's 12,000 km fibre cable and licensed wireless backbone (SuperNet), is "open access", such that "[ISPs] and [ASPs] can purchase bandwidth from SuperNet...at standard rates throughout the province.".

*** Since 1996, Canadian cable companies are required to be third party "open access". The Canadian Cable TV Association is committed to supporting the regulation "…in large part because it is in the cable companies' financial interest.".

*** The major (Comcast, Charter, Time-Warner, Cox) US CATV companies are "open access" to ISP choices in either regional or national markets. According to Cox: "We think it makes good business sense.". Opening their networks to multiple TV service providers is unlikely due to current limitations of HFC technology.

*** New Edge Networks Inc, is an "access technology agnostic" carrier providing broadband services such as: xDSL, dedicated Internet access, Frame Relay, private lines, ATM, T1 thru OC12, IP, Ethernet, VPN. They own & operate the switching equipment, but lease network transport (80,000 km) and colocation facilities. Currently they own 18 regional hubs, and 600 nodes, serving 95% of the LATAs nationwide, including Omaha, Lincoln, Des Moines, and Kansas City. The private firm is generating positive surplus cash flow.

*** Cheney WA is installing fibre to all premises, with the municipality operating the network as a "wholesaler", using a "...non-proprietary and open architecture, which allows multiple competitors to offer services over the pipes.".

*** Lafayette LA Utilities System municipal utility has installed a 100 km fibre ring, selling managed network services "…exclusively to wholesale customers - CLECs, ISPs, and the local government and educational agencies.…".

*** "Memphis Networx" in Memphis TN installed a 180 km fibre net, providing SONET, Ethernet, colocation, and optical wavelength services, all over a "…neutral…" and "…wide open network…".

*** Palo Alto CA: The municipal utility installed and maintains a fibre MAN, and only leases dark fibre - no bandwidth limitation. The "open access" network has 100+ ISPs, 12 telephone companies, and 3 (business service) broadband providers.

*** Jackson Energy [municipal] Authority (JEA), Jackson TN, is starting a 31,000 premises passed FTTP overbuild. "JEA will build and operate the network and directly provide [CATV] service. JEA will contract with local groups to provide telephone and Internet service, as well as involve local groups to provide community programming.".

*** Reykjavik Energy (Iceland) "...is open to all service providers. The customer activates each service and pays each service provider directly...Once a customer activates any service, the utility charges a fixed monthly fee regardless of the number of services uses. The utility also receives revenue-sharing from service providers.". The FTTP local loop is "unbundled" and infrastructure is shared (e.g. colocation). At end of 2004, anticipated to have 4,000 customers, and 15,000 in 2005. Retail service providers consist of a duopoly, split 69% - 31%. There are also two providers serving the corporate market.

*** Oskaloosa IA - Mahaska Communications Group constructed and operates a city-wide FTTP. They are an "open access" network, charging subscribers a usage fee of $5 to $40/month, over which subscribers can access retail service providers of their choice.

*** Vasteras Sweden – The municipal utility installed a FTTP network in 2000 to 1,700 organizations, with plans to expand it to 50,000 residential households. Users choose from among, currently 50 services, direct with the providers. The FTTP network operator and retail service providers share the revenue (users do not pay the FTTP network operator directly). 70% of the network traffic is local, and does not traverse the Internet outside of the municipal network. The system is open access, with retail service providers signing supplier's contracts with the FTTP network operator.

*** Southern VA - The "Mid-Atlantic Broadband Cooperative" has received funding for a "…wholesale open access fibre-optic network.", the first phase being 225 route km. An RFP for design and engineering was issued in NOV 03. Danville VA has installed 60 route km of fibre, with plans to connect all premises in a FTTP overbuild, based upon "Open access to the city's [MAN] to all.". Danville also plans to construct a MSAP (note C), similar to the MSAP in Blacksburg VA.

*** UTOPIA, an "open access" network, encompassing 75% of Utah's population, began construction in AUG 2004, with phase 1 connecting 50,000 premises. "UTOPIA solely provides carrier-class wholesale transport services - it does not provide retail services in any capacity. Each service provider owns its own customer relationships - directly selling, marketing, and billing their customers.". Utopia "...will rely on revenues from service providers to repay the bonds.".

*** Provo UT: In OCT 2004, the municipal utility began construction of a FTTP overlay to 30,000 premises. Retail providers will offer services over the open access network.

*** Sacramento & Roseville CA corridor: SureWest Communications provides "Carrier neutral connectivity" to the largest FTTP network (10,000 premises out of 50,000 passed premises) in the US. "The main driving force is to have an open architecture vs. a proprietary system, which enables us to work with multiple vendors and drive down costs…".

*** Mobile Virtual Network Operator (MVNO). Wireless network operators, such as Sprint, are leasing spare network capacity to MVNOs, such as AT&T, which do not own such networks. The network operators realize it is better to "wholesale" spare network capacity than to leave it unused. The MVNOs often target a market which the network operator does not.

MISSION STATEMENT for "Overbuild": OSI Layer 1 open access transport provider. Thereby encouraging variety and competition among content and service providers. The objective being the greatest number of choices & provider quality for end-users, continually increasing ATS to the community, thereby also maximizing financial return to Overbuild investors. Also consider whether to offer NSP (Network Service Provider) OSI Layer 2 and Layer 3 capabilities. The Overbuild entity should be separate from a Switching entity, to help ensure Overbuild is indeed retail service provider neutral.

(B) "Switching" profit center pays "Overbuild" profit center for the use of its pipe to transport service & content to subscribers. Or, dependent upon the business plan, Overbuild invoices end-users directly for access to the overbuild network.

Survey potential subscribers determining current and future telecommunication content & service needs. Potential demand for both Overbuild and Switching might be partially obtained by first reselling Qwest services. Business plan TBD. In general, a retail and/or wholesale OSI Layers (note C) 3 or 4 thru 7 service provider.

Retail telecommunication firms have substantial challenges, without also addressing the wholesale market. The American Customer Satisfaction Index, surveying 70,000 households in 2001, reports 33% dissatisfaction with local telecommunication providers, and 27% dissatisfaction with long distance providers, and rising dissatisfaction over the past 7 years of surveys, regardless of size of service provider firm.

For 2002, there was no statistical difference: 32% dissatisfaction with local service and 27% dissatisfaction with long distance. The MAY 2005 report shows 30% dissatisfaction with "fixed line telephone service providers", and 39% dissatisfaction with "cable and satellite TV providers". Indicators measured: customer expectations, perceived quality, perceived value, customer complaints, & customer retention.

The National Regulatory Research Institute reported these dissatisfaction rates in FEB 02: 53% with local phone service; 55% with long distance (LD) and cellular service (CEL); 58% with CATV service. FEB 2003 rates were: local service unchanged, 56% dissatisfaction with LD & CEL, 59% dissatisfaction with CATV. "Service" includes "perception of service quality and price", and "consumer contact with providers for issues such as billing, sales, termination, switching, rates.".

A Nemertes Research survey of business firms, reporting in JUL 2004, a 36% dissatisfaction level with the major LECs (Qwest, etc), and 30% dissatisfaction with the major long-distance carriers (MCI, etc).

The Customer Care Alliance 2004 survey of households reports 10% of the respondents experienced problems with telephone (landline and cellular) service providers. Of those 10%, 86% were very or extremely dissatisfied with the providers, the predominant issues being billing and repair. It took an average of 5.6 contacts with the provider, by the subscriber, in attempting to resolve a problem, and even then, only 2% of the subscribers were satisfied with the outcome. With 10% of respondents replying with telephone problems, that places the telephone industry in the top 12% of all industries surveyed, as having the most problems with subscribers. 91% of those subscribers shared their story with friends/other people

MISSION STATEMENT for “Switching” profit center: a for-profit entity providing various types of services, such as Service Portal, Application Service Provider, Managed Service Provider, Internet Service Provider, Content Provider, Carrier.

(C) See ROIF Telecommunications Committee OVERVIEW for definition.

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