LEGAL AND REGULATORY CHALLENGES TO UNIVERSAL PERSONAL COMMUNICATION SERVICES PROVIDED BY LOW EARTH ORBITING SATELLITES

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Technological innovations in mobile communications present the near term prospect for service any time, any place via handheld terminals. The unprecedented marketplace success of cellular radio and other mobile technologies confirm our desire to stay in touch while on the move. Likewise, they stimulate demand for additional spectrum allocations.

The 1992 World Administrative Radio Conference ("WARC-92") held in Malaga-Torremolinas, Spain endorsed the concept of Universal Personal Communication ("UPC"). However, consumers currently have limited access to terrestrial "islands" of local communication services. A variety of different operating standards further limit the prospect for "seamless" connectivity across national borders.

Low and middle earth orbiting satellite projects, like Motorola's Iridium, TRW's Odyssey, Loral/Qualcomm's Globalstar, and Inmarsat's Project 21 present the near term potential to bring the UPC vision to fruition. These ventures include a constellation of between 12 and 66 non-geostationary orbiting satellites providing an interoperating array of beams that illuminate the entire globe. Individually and collectively these systems aim to provide ubiquitous, wireless, digital coverage to pocket-sized telephone.

Defining UPC

Regulators primarily have considered personal and wireless communications as closed, self-contained services. Rather than plan proactively, they have reacted to complaints about the type and nature of interconnection and integration with the existing wireline infrastructure. Few have considered the potential to extend and augment the services of incumbent carriers, as opposed to the view that UPC poses a financial and facilities by-pass threat.

Perhaps a better way to consider is to think in terms of inter-personal, ubiquitous communications provided via tetherless technologies linked with existing wireline networks:

1) inter-personal, because the purpose of such services is to expand the reach of networks to serve and reach mobile users;

2) ubiquitous, because only satellite systems can provide worldwide coverage, and thereby realize the full potential for UPC;

3) tetherless, because UPC provides freedom from cords

rather than independence from the existing wireline infrastructure; and

4) linked with existing wireline networks in a partnership to expand the reach and utility of both networks.

Scope of Regulation

In the United States, the Federal Communications Commission uses two primary regulatory classifications in telecommunications:

1) common carrier - service providers obligated to serve anyone requesting service on non-discriminatory terms and conditions; or

2) private carrier - service providers offering optional services on a contractual basis.

Private Carriage

To achieve the vision of UPC, regulators should create an environment supporting investment in new non-wireline networks. A private carrier designation in the United States means that tetherless communication operators can provide service on contractual terms and conditions without conventional regulation. Such a designation affords greater flexibility in configuring service, and fosters competition by creating an environment conducive to market entry and growth. It also would make it possible for foreigners to make sizeable investments, as alien ownership restrictions are less burdensome for non-common carriers.

Spectrum and Service Limitations

The nations of the world have agreed to allocate sufficient spectrum to encourage innovation, but each country must follow up with domestic allocations, assignment of frequencies and licensing of operators. Ironically, this domestic regulatory process can take much longer and involve more difficult compromises than the WARC process, where nations perceived mutual benefit in reaching a timely consensus. The emphasis on procedural fairness in licensing, the number of competing applicants and yet to be resolved coordination between incumbents and new spectrum users may delay the onset of UPC.

To its credit, the FCC has acknowledged the potential for delay, and has endeavored to find ways to expedite the U.S. regulatory process. The Commission has launched timely Rulemakings to implement the decisions reached at WARC-92. Both the Congress and the FCC have recognized the need to create a spectrum reserve to accommodate the requirements of new services. 200 MHz of spectrum previously allocated for government use will be reallocated for commercial applications, a decision exemplifying the willingness to force even existing government users to consume spectrum more efficiently.

Additionally, the United States Congress authorized the FCC to assign spectrum on the basis of competitive bidding, rather than use lengthy comparative

hearings or random selection. To assist in accelerated deployment of new technologies, the FCC recently created a mechanism whereby licensed personal communication service providers can provide compensation to incumbents as an incentive for relocating to another frequency band earlier than required by regulatory order.

Speedier Licensing

The UPC vision requires national licenses and operating authority throughout the world. The larger the number of participating nations, the closer we are to reaping the full potential of LEO/MEO technology. However, the licensing process serves as a key forum in some nations for addressing numerous issues that can distract the attention of regulators on the potential to achieve the UPC vision. It can also create a spectrum shortfall simply by treating as legitimate any application, no matter how unqualified or ill-prepared the applicant may be to bring a viable service to market.

For example, the United States licensing process emphasized procedural due process when more than one applicant vies for limited spectrum. Lengthy and costly comparative hearings are a possibility where random drawings by lottery or spectrum auctions are considered unwise.

The FCC recognized the burdens imposed by its licensing process and has granted some applicants experimental authority to construct and operate satellites for testing, in advance of the Commission's consideration of applications for permanent authority.

The FCC also has attempted to create incentives for the applicants collectively to settle disputes and agree on operational terms and conditions. Such alternative dispute resolution processes may enable prospective service providers to resolve licensing, operational and logistical issues on an expedited basis before regulatory intervention. However, some parties may perceive a benefit in a delay that handicaps better prepared applicants more keenly interested in a rapid market evolution to personal communications.

Absent consensus among the interested parties in what is called a "Negotiated Rulemaking," the FCC must resort to the conventional public rulemaking process by which it issues a Public Notice creating a cycle for a series of comments and proposals by any interested party.

Fundamental difference in system attributes and time horizons may frustrate the goal of expedited regulatory action. At this point, alternatives to the lengthy FCC Rulemaking and licensing process present the slim possibility of reducing the procedural delays to service deployment and enhancing the prospect for innovators to bring a new service to market.

Standard Setting

International agreement on technical standards, including dialing plans, is vital for achieving the vision of UPC via

handheld terminals. Without a common air interface, users will not be able to access different networks. Without agreement on transmission standards, consumers will encounter segmentation of available spectrum and the prospect of separate and non-interconnected networks.

The concept of number portability means that callers can reach a number of different terminals, operating in different service environments via a single telephone number. Complex switching protocols and call sequencing issues await resolution. If nations and service providers can reach closure on such issues, users quickly embrace new technological options.

Conclusion

Numerous regulatory issues challenge visions of ubiquitous tetherless communications. However, procedures exist in domestic and global forums for resolving differing viewpoints. WARC-92 provides clear evidence of how far nations can go to resolve disagreements and different visions when they seek solutions and are willing to compromise positions. However, the domestic regulatory and licensing process often creates a context that favors procedural fairness, perhaps at the expense of timeliness and efficiency.

Technological innovation can provide us with any time, any place telecommunication capabilities. However, a variety of regulatory issues currently stand in the way of bringing such functionality to market. The issues contained in this brief paper do lend themselves to coordinated resolution. National governments should follow the model of success reached at WARC-92 and expedite the deployment of desirable technologies and services.

Literature

International Telecommunication Union, Final Acts of the World Administrative Radio Conference (WARC-92), Malaga-Torremolinos, 1992 (ITU: Geneva, 1992);

United States Federal Communications Commission, Amendment of Parts 2, 22 and 25 of the Commission's Rules and Policies to Allocate Spectrum for and Establish Other Rules and Polices Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Communication Services, Gen. Docket No. 84-1234, Report and Order, 2 FCC Rcd. 1825 (1986) (allocating 27 MHz of L-bank spectrum for Mobile Satellite Service to be shared with Aeronautical Mobile Satellite Service), 2d report and Order, 2 FCC Rcd. 485 (1987) (deciding to license only one MSS constituting a consortium of applicants), recon.den., 2 FCC Rcd. 6830 (1987); on further recon., Mem. Op. & Ord, 4 FCC Rcd. 6029 (1989), partially reversed and remanded sub nom. Aeronautical Radio, Inc. v. FCC, 928 F.2d 428 (D.C. Cir. 1991), Tentative Decision on remand, 6 FCC Rcd. 4900 (1991), Final Decision on remand, 7 FCC Rcd. 266 (1992).

Amendment of Part 2 of the Commission's Rules to Allocate Spectrum for Mobile Satellite

Services in the 1530-1544 MHz and 1626.5-1645.5 MHz Bands, Gen. Docket No. 90-56, Notice of Proposed Rulemaking, 5 FCC Rcd. 1255 (1990) (proposing a co-primary reallocation for incumbent Maritime Mobile Satellite Service and a new Mobile Satellite Service, conditioned on real time, preemptive access for distress and safety communications), First Report and Order and Further Notice of Proposed Rulemaking, 8 FCC Rcd. 4246 (1993) (implementing successful spectrum reallocations decisions reached at the 1992 World Administrative Radio Conference).

Amendment of Sec. 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low Earth Orbit Satellites, ET Docket No. 91-280, Report and Order, 8 FCC Rcd. 1812 (1993) (allocating spectrum in the VHF and UHF bands for small LEO satellites providing data and position indication services); see also Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to Non-Voice, Non-Geostationary Mobile-Satellite Service, CC Docket No. 92-76, Notice of Proposed Rulemaking, 8 FCC Rcd. 6330 (1993).

Amendment of Sec. 2.106 of the Commission's Rules to Allocate Spectrum the 1610-1626.5 MHz and the 2483.5-2500 MHz Bands For Use by the Mobile-Satellite Service Including Non-Geostationary Satellites, ET Docket No. 92-28, Notice of Proposed Rulemaking and Tentative Decision, 7 FCC Rcd. 6414 (1992); Amendment of Sec. 2.106 of the Commission's Rules to Upgrade to Primary Status the Secondary Mobile Satellite Service Allocation at 19.7-20.2 GHz and 29.5-30.0 GHz, ET Docket No. 92-191, Notice of Proposed Rulemaking, 7 FCC Rcd. 5626 (1992).

For an outline of how the United States prepared for the 1992 World Administrative Radio Conference, see An Inquiry Relating to Preparation for the International Telecommunication Union World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum, Gen. Docket No. 89-554, First Notice of Inquiry; 4 FCC Rcd. 8546 (1989), Second Notice of Inquiry, 5 FCC Rcd. 6046 (1989); Supplemental Notice of Inquiry, 6 FCC Rcd. 1914 (1991); Report and Order, 6 FCC Rcd. 3900 (1991); United States Dept. of State, United States Proposals for the World Administrative Radio Conference Malaga-Torremolinas, Spain 1992 (Washington, D.C. 1991). See also Amendment of Parts 2, 25, 80 and 87 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference for Mobile Services, Geneva, 1987, Report and Order, 4 FCC Rcd. 7603 (1989) (domestic codification and implementation of 1987 WARC spectrum allocations on mobile services); The Plenipotentiary Conference of the International Telecommunication Union, Nice, France (1989), Gen. Docket No. 88-351, Notice of Inquiry, 3 FCC Rcd. 4478 (1988), Report and Order, 3 FCC Rcd. 7139 (1988).

See also Preparation for International Telecommunication Union World Radiocommunication

Conferences, ET Docket No. 93-198, 8 FCC Rcd. 4512 (1993).

Amendment of Part 2 of the Commission's Rules to Allocate Spectrum for Mobile Satellite Services in the 1530-1544 MHz and 1626.5-1645.5 MHz Bands, Gen. Docket No. 90-56, First Report and Order, and Further Notice of Proposed Rulemaking, 8 FCC Rcd. 4246 (1993) (implementing spectrum reallocations decisions reached at the 1992 World Administrative Radio Conference).

Amendment of Sec. 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellites, ET Docket No. 91-280, Report and Order, 8 FCC Rcd. 1812 (1993)(allocating spectrum in the VHF and UHF bands for small LEO satellites providing data and position indication services).

Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to Non-Voice, Non-Geostationary Mobile Satellite Service, CC Docket No. 92-76, Notice of Proposed Rulemaking, 8 FCC Rcd. 6330 (1993).

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