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Practical Solutions for Communications Policy

Long-Term Restructuring Idea 1: Layering or Integrating Networks and Services

July 11, 1994; Revised October 10, 1994
*Presentation at the July 1994 NARUC Meeting
San Diego, CA*

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Telecommunications Industries Analysis Project:
Long-Term Restructuring Idea 1: Layering or Integrating Networks and Services

Carol Weinhaus, Teresa Pitts, Mark Jamison, *et al.*
July 11, 1994.

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Introduction

Introduction

This paper provides two alternatives to the current regulatory structures in telecommunications. The first alternative, called "layering," divides communications services into three basic categories - network, gateway, and content. Different regulatory rules can be applied to each category. In the second alternative, called "integrating," services blend these categories (network, gateway, and content) so that service providers have complete control.

This paper is the first in a series of papers, each of which presents options or ideas for a new regulatory framework. Companions to this paper include:

- ■   ***Abort, Retry, Fail? The Need for New Communications Policies.***
  Describes the need for a new framework for communications policies.

- ■   ***Universal Service Tool Kit, Part 1: Getting from Here to There: Transitions for Restructuring Subsidies.***
  Provides ideas for moving from the current subsidy structure to new long-term policies.

- ■   ***Universal Service Tool Kit, Part 2: Beyond Cost Allocations: Benchmark Subsidy Method.***
  Presents a single mechanism for subsidies, regardless of whether a market is competitive or not. The *Benchmark Subsidy Method* provides incentives to service providers to be efficient and allows competitive markets to operate efficiently.
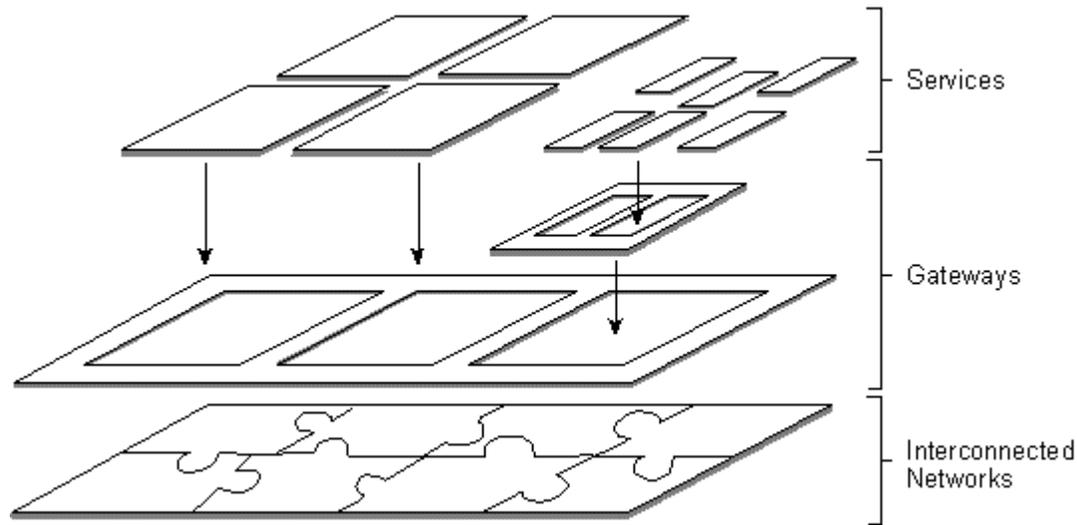
Future Idea #1A
Layering

Figure #1A: Layering

Objective:

"Layering" is one method for structuring regulatory rules for communications services and the networks which carry them. Layering allows multiple interconnection points and different regulatory rules for each layer. For the opposite approach, see "Integrating" (Future Idea #1B).

Description:

There are three basic categories in the layering approach.

- *Network* - Includes transmission paths and basic routing functions.
- *Gateway* - Connection between network and content. Functions include more sophisticated routing, billing, storage, and processing.
- *Content* - Information transmitted, stored, and/or processed. Content may be customer provided (such as voice conversations) or vendor provided (such as directory assistance).

For example, Wired magazine can be obtained through America Online, a computer service that delivers this magazine as a computer file instead of the traditional paper copy bought in the store or mailed to the home. Wired is the

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Description, cont.:

content provider. America Online provides the gateway. Sprint and the customer's local telephone company provide the network.

Regulatory Structure:

The layering approach is common in the personal computer world, where software literally provides a window (gateway) on the customer's computer (network) for other software products, such as word processing or spreadsheets (content). Layering applies this approach more broadly to include regulatory rules.

- Provides uniform policies that cross traditional industry boundaries.

  It is possible to provide interconnection among multiple networks and service providers and use the same rules for everyone who is similarly situated in a given layer. This eliminates disparities in the current structure, which applies different rules and regulations for each communications industry.

- Moves regulations from companies to situations.
- Requires rethinking traditional policies.
- Requires transitions because many current services are bundles of network, gateway, and content.

Examples of Revised Regulatory Rules:

The same rules apply whether the markets are competitive or not, or some rules could apply only when there is not competition.

- *Networks* - Rules for price, quality, interconnection, and tariffs.

- *Gateways* - Rules for price, quality, availability, interconnection, and tariffs.

- *Content* - Copyright, patent, freedom of speech, and similar laws.

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Checklist of Issues Addressed by Layering Idea:

Interconnection:	*Issue Covered*
1. What are the points where interconnection can occur?	x
2. What are the arrangements for intercompany payments?	
3. How are standards for interconnection determined?	
4. How should operating information be made available to other networks? (electronic bonding)	x
5. How should intelligence be distributed in networks?	x
Regulation:	
6. How should prices be set?	
7. Who should be allowed to own service and network providers?	x
8. What barriers should there be to entering markets?	x
9. What services need to be regulated?	
10. When should regulated services be deregulated?	
Public Policies:	
11. Should there be subsidies? If yes, what should be the subsidy mechanism(s)?	
12. What are the universal service goals?	
13. What are the universal access goals?	
14. How should carrier or service of last resort be treated?	

Future Idea #1B
Integrating

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Network
- Content
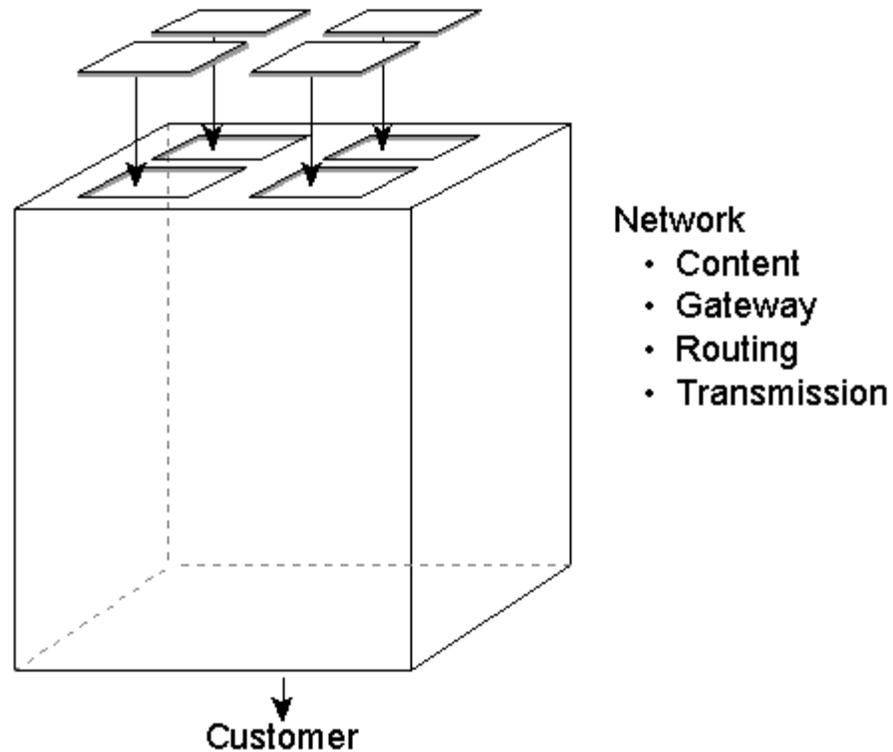- Gateway
- Routing
- Transmission

Customer

Figure #1B: Integrating

Objective:

"Integrating" is one method for structuring regulatory rules for communications services and the networks that carry them. This approach makes it possible for each service provider to have complete control of services. For the opposite approach, see "Layering" (Future Idea #1A).

Description:

Networks and services are integrated. In the extreme case, there is no interconnection everything could be provided by a single company. However, it is possible to have multiple integrated service providers.

For example, TCI is an integrated service provider. TCI provides the network, the set top box, and the content for its cable television services.

Another example is US WEST's electronic white pages. US WEST provides the network functions and the content.

Regulatory Structure:

The integrated approach is common to cable television and some local telephone company services where each has a separate network designed for its own mixture of services. Regulatory treatment with this approach can vary, as it does today. For example, telephone companies are considered common carriers, but cable television companies are not.

- Policies can easily vary by company and situation, but policies would need to change as formerly separate industries begin to compete.

- Traditional policies can be applied as long as barriers between industries remain.

- Deregulation of parts of integrated services and networks is difficult.

Example of Revised Regulatory Rules:

Traditional policies would apply.

Future Idea #1B
Integrating, cont.

Checklist of Issues Addressed by Integrating Idea:

Interconnection:	*Issue Covered*
1. What are the points where interconnection can occur?	x
2. What are the arrangements for intercompany payments?	x
3. How are standards for interconnection determined?	x
4. How should operating information be made available to other networks? (electronic bonding)	x
5. How should intelligence be distributed in networks?	x
Regulation:	
6. How should prices be set?	
7. Who should be allowed to own service and network providers?	x
8. What barriers should there be to entering markets?	
9. What services need to be regulated?	
10. When should regulated services be deregulated?	
Public Policies:	
11. Should there be subsidies? If yes, what should be the subsidy mechanism(s)?	
12. What are the universal service goals?	
13. What are the universal access goals?	
14. How should carrier or service of last resort be treated?	

Appendix A: Description of Issues Checklist

Description of Issues Checklist

Each idea has a checklist of issues to indicate what areas are covered by the idea. Comparisons of checklists indicate only the scope of an idea and not whether it's good or bad. This appendix provides descriptions of the issues - presented in the form of questions - in the checklist.

Interconnection:

1. *What are the points where interconnection can occur?*
   Covers where interconnections can occur and who determines it. If there are separate providers for content, gateways, and/or networks, these providers need to interconnect.

2. *What are the arrangements for intercompany payments?*
   Covers methods of compensation among service providers (including interconnection between companies). This issue includes who makes the payments, who receives the payments, the terms and conditions, and the degree of regulation.

3. *How are standards for interconnection determined?*
   Sets up how service providers agree upon technical standards that allow interconnection among companies. This issue includes who makes the standards and how the standards are established.

4. *How should operating information be made available to other networks? (electronic bonding)*
   Covers how network providers make operations and support information available to other network providers.

5. *How should intelligence be distributed in networks?*
   Determines who controls services   customers, network providers, gateway providers, content providers, or some combination of these.

Regulation:

6. *How should prices be set?*
   Describes methods for price-setting and regulatory oversight, including deregulation.

Regulation, cont.:

7.   *Who should be allowed to own service and network providers?*
Addresses ownership restrictions. Current regulatory rules restrict certain forms of ownership. For example, there are limits on the number of cellular telephone licenses that telephone companies may own.

8.   *What barriers should there be to entering markets?*
Current regulatory rules place limits on which companies can compete in certain markets. This issue covers these barriers to entry.

9.   *What services need to be regulated?*
Determines which communications services are regulated and which are not regulated.

10.   *When should regulated services be deregulated?*
Determines conditions for deregulation. Some regulated communications may be deregulated under certain conditions   for example, if there is competition.

Public Policies:

11.   *Should there be subsidies? If yes, what should be the subsidy mechanism(s)?*
Encompasses when there should be subsidies and how the subsidies should work.

12.   *What are the universal service goals?*
Covers which public policy goals apply to which services, since these goals vary among services.

13.   *How should carrier or service of last resort be treated?*
Encompasses the meaning of carrier of last resort or service of last resort, and alternative policies.

Appendix B: Project Information

List of Participants in the Telecommunications Industries Analysis Project, June 1994

State Regulators	NARUC representatives from:
	Iowa Utilities Board
	New York Public Service Commission
	Washington Utilities and Transportation Commission
Regional Holding Companies	Ameritech
	Bell Atlantic
	BellSouth
	NYNEX
	Pacific Telesis
	Southwestern Bell
	U S WEST
Large Independents	GTE
	Sprint Local Telecom Division
	Anchorage Telephone Utility
Interexchange Carrier	AT&T
	Sprint
Foreign Domestic	NTT America
	InfoCom Research, Inc.
Local, National, and International Services	BT
Materials Manufacturers	Corning

Sponsors:

Corporation for Public Broadcasting

Assisting with *public* data:

Federal Communications Commission
National Exchange Carrier Association

Background on the Telecommunications Industries Analysis Project

The goal of the Telecommunications Industries Analysis Project is to provide information to support the development of alternative communications policies to meet the needs of stakeholders in an environment that includes competitive and non-competitive markets, federal and state regulatory jurisdictions, and a proliferation of new services made possible by technological advances. The purpose of the project is to produce research and analysis which will assist policy makers in making informed decisions.

The project is a neutral forum of communications industry stakeholders exploring multiple viewpoints of selected issues. This forum incorporates the following elements:

- **Broad representation:** The current forum includes local exchange carriers, interexchange carriers, materials and equipment manufacturers, and regulators. The project actively seeks expansion of this forum to include other communications industry representatives, such as competitive access providers, cable television companies, computer companies, electric power utilities, and publishers.

- **Multiple viewpoints:** Participants are required to have an active role in the research and analysis, to represent their own interests, to understand and to assist in developing others' perspectives, and to work toward the common goal of representing multiple views.

- **Analysis and results of alternative policies:** Research tools, including a jointly-produced data base and computer software models, and data analysis developed by this forum create a common language for examining issues. The common language allows the participants to focus on underlying issues. Appropriate computer software tools are developed, and existing tools are modified.

- **All data, analysis methods, and results are public:** Data used by this project must be publicly available on a nationwide basis. Research products become public domain information.

- **Neutral setting:** The project resides in a neutral setting, free of partiality, thereby ensuring objective and independent research.

What the Project has Done

The project has conducted public workshops at the national meetings of the telecommunications industry regulators. The project's research papers have been the basis for meetings with the Federal Communications Commission, Congressional staffs, the Congressional Research Service, and the National Telecommunications Information Administration.

The project has also produced a number of papers plus software modeling tools for the analysis of financial impacts of new technology deployment and of changes in the financial structures themselves.