



# Services Update: What Does The Carrier Landscape Look Like for MAN/WAN Services

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# Agenda

- Industry Overview
- Technology Trends
- Service Trends



# Industry Overview

What key factors will affect the network and telecom industry?

1. Customer/User Demand
2. Technology
3. Business Models and Industry Environment
4. Public Policy and Regulations



# Industry Overview

## Technical Issues and Challenges

(unknowns where “reasonable people” may disagree)


- Overlay networks (parallel to the public Internet) for assured performance vs. the improving Internet
- Content control by network vs. end devices
- Wireless standards shakeout (3G vs. 802.16)
- Joining PSTN-separated “islands” of VoIP, and NAT/firewall traversal (session border controllers? ENUM?)
- Metro/last-mile for content delivery (fiber/copper, multicast, caching), and storage substitution for bandwidth
- Techniques for spectrum re-use threaten spectrum “ownership”
- Where should intelligence reside -- network vs. edge?



## Key Technology Decision: Smart vs. Dumb Nets

- “Smart” Networks
  - Operation as an intelligent “system” rather than point products
  - Self-provisioning, self-optimization, self-defense, etc.
  - Application-awareness, optimized for specific applications and services, decreases cost of ownership, improves security
- “Dumb” Networks
  - Based on “Internet end-to-end principle:” keep networks as simple as possible, most intelligence and functionality at the edge
  - Fosters new services and application development by separating content and apps from transport - no central coordination required, empowers users
  - What made the Internet so successful, in contrast to the PSTN

## Service Provider Business Issues

- Replacement of declining voice revenues
- Profitability of basic IP network transport
- Ability of incumbent carriers to provide content
- Cost of necessary infrastructure upgrades (e.g., fiber deployment)
- Issues of “walled gardens,”
  - Mobile operators (e.g. Verizon Bluetooth restrictions)
  - Service providers (port filtering, traffic classification)
- New entrant opportunities: What is a “service provider?”
  - Overlay VoIP providers relying facilities-based carrier networks
    - Confusion over service provider use of their own networks
- Industry consolidation
  - SBC, Verizon, France Telecom  AT&T, MCI, Equant



## Public Policy/Regulation Key Issues

- Re-thinking "Common Carrier" definition and applicability
- Do natural monopolies still exist?
- Why regulate at all?
- How to create technology-neutral "level playing field" regulations?
  - Is port blocking legal?
- How to generate funds/subsidies for programs like universal service, emergency location services?
- Are some providers "too big to fail?"



## Conclusions

- Next gen networks now influenced more by business and regulation than new technologies -- the lagging (disruptive) effects of IP networking
- "Convergence" now means:
  - Communications (voice/video/IM) and content
  - Service provider, enterprise, and home
- New business models required for a new world
- Enterprises must track and understand these developments



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## MPLS vs. The Internet

- Virtually all WAN services are now based on MPLS
  - Service providers collapsing multiple networks into core IP/MPLS network
  - Almost all providers offer either MPLS-VPN services at Layer 3, or Virtual Private LAN services at Layer 2
- Internet substitution is primary alternative (IPSec)
  - As Internet performance continues to improve, at what point does the Internet become a better alternative?
- Metro Ethernet continues to expand
  - Now available in most metropolitan areas
  - Carrier-neutral data centers become increasingly attractive



## MPLS-VPN Implementation Issues

- Multi-carrier strategy often required
  - Virtual Network Operators (VNOs) -
    - Outsourcing the heavy lifting of multi-carrier
  - Carrier Alliances doing "real" inter-provider MPLS
    - Only a few, mostly regional carriers - don't look for large providers to offer this service in 2005
- "Homegrown" Multi-carrier Is Difficult
  - Requires infrastructure, QOS mapping, vendor management



## Wireless WAN/MAN Services Emerging

- The battle is just beginning for wireless wide area networking (WWAN) supremacy
  - 802.16-2004 (WiMAX) & 802.16e, 802.20 for regional coverage
    - 802.20 and 802.16e are still not ratified (mobile communications)
  - Mobile technologies will impact the WWAN battle
    - 3G Mobile
      - EV-DO; UMTS; HSDPA (high speed downlink packet access)



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## Service Providers Want To Be More Than Bit Haulers

- Public VoIP service offerings continue to expand
  - Both in features and geographic coverage
  - IP Centrex, Voice VPN, Peering
- But, serious issues remain
  - Unproven service delivery models
  - Concern over provider viability
  - Concerns over security, operations and management
- Expectations:
  - Services from ILEC, PTT, IXC providers will continue to expand
  - Potential entry of application services organizations



## Performance Management Services

- Service providers see opportunities growing in managed network services
- “The transaction is the new element”
  - Managing individual links and boxes is not sufficient
- Aggressive new market entrants competing in:
  - Web transaction, Web services management
  - VoIP management
  - Security management
  - Federation/Identity management
  - Application performance optimization
    - New developments in the area of rapid diagnosis
      - Correlating application-level and network-level views of problems