Transition of the PSTN

Competition Matters

- Fosters Innovation
- Provides affordable broadband to small/medium size businesses, as well as vast array of other consumers benefiting from services and applications
- Promotes Economic Growth/Job Creation
- Spurs Investment

Competitors Innovate

Examples:

- Forefront in introducing IP to PSTN
  - As of December 2012, in the business market, competitors have ***nearly ten times*** the number of VoIP lines as ILECs.
  - Some COMPTEL members are all IP
- Ethernet, including Ethernet over Copper
- Dynamic Capacity Service (bandwidth on demand service for business users)
- SS7 signaling transport over IP network
- Soft switches
- Cloud Services
- LAN Management
- Multi-location Unified Communications
- Commercial DSL
- Customized solutions with excellent technical support, e.g., IT, billing, bundled services, customer service, etc.)

Consumers Benefiting from Competition

- Small to medium size businesses, enabling these businesses to invest, grow, and create jobs;
- Enterprise customers with multi-locations, providing benefit of one provider company-wide;
- Vast array of industries served, e.g., health care providers, educations institutions, non-profits, etc.; and
- Municipal and governmental locations, e.g., public safety and homeland security first responders.

Competition Creates Economic Growth

- Competitors *are* – and *serve* – small businesses.
- Small businesses are the growth engines of national economy
  - Small businesses created 67% of net new jobs from mid-2009 to 2011.*
  - Small/mid-size companies spent $293 billion of the $326 billion spent nationally on IT budgets (90%).*
- As businesses become increasingly reliant on broadband, supporting competitive options in this marketplace becomes more important.
  - According to a recent survey, small businesses want "the ability to choose from more providers."*

*http://thebroadbandcoalition.com/storage/images/Driving-Small-Business-Forward.pdf

Competitors Invest

- Primarily private capital.
- Non-ILEC investment in 2012 was 43% of total wireline expenditures.
- COMPTEL has members spending 12% to 25% of revenue on cap ex for first 9 months of 2013. AT&T and Verizon's is 16% and 13%, respectively.
- Upstream investment, such as middle-mile and/or long-haul network investment, is often based on a business case dependent upon last-mile access to aggregate traffic and/or reach customers.
- As the Commission found with regards to data roaming, the ability to supplement your network through wholesale services further encourages network investment elsewhere.

Necessary Elements for Competition

- Last Mile Access
- Interconnection

FCC Recognized that Its Wholesale Last Mile Access Policies Need Reform…

- The "nation's regulatory policies for wholesale access affect the competitiveness of markets for retail broadband services provided to small businesses, mobile customers and enterprise customers…
- Unfortunately, the FCC's current approach is a hodgepodge of wholesale access rights and pricing mechanisms that were developed without the benefit of a consistent, rigorous analytical framework…
- For example, some wholesale access policies vary based on technology – including whether the facility or service operates using a circuit-or packet-based mode or is constructed from copper or fiber-regardless of economic viability of replicating the physical facility."

  Federal Communications Commission National Broadband Plan at 47.

…Otherwise Customers will Lose their Competitive Provider

- While the Act is technology neutral, FCC implementation of last mile access provisions are NOT, thereby, putting competition at risk….
- …as the industry transitions from TDM to IP service
  - FCC has relieved ILECs of unbundling obligations and non-dominant and *Computer Inquiry* obligations to provide reasonably priced non-TDM based packet-switched broadband services and non-TDM based optical broadband services;
- …and, as the industry transitions from copper to fiber facilities
  - FCC significantly altered critical aspects of the unbundling obligations adopted by Congress with rules that allow, even in areas where impairment is found, ILECs to 'retire' copper loop and deny access to a functionally and similarly priced alternative wholesale product.

ILEC Wireline Wholesale Last Mile Access Obligations are Still Essential to Retail Competition

- The vast majority of competition in the business market comes from traditional (non-cable) CLECs that substantially rely on last mile access from the ILEC.
  - "Despite investing billions of dollars in recent years to expand and upgrade its network throughout its incumbent (ILEC) and competitive (CLEC) local exchange areas, Windstream's substantial CLEC operations still rely on AT&T's ILEC facilities for last-mile access to serve consumers in AT&T operating territories." *Windstream Nov. 22 Ex Parte*
  - USTelecom estimates that cable only serves ***less than*** 1 million of the 60 million business lines in U.S. (USTelecom April 2013 report based on YE2011 data.)
- Broadband, Wi-Fi, LTE, 4G, and Ethernet all rely on robust wired networks.
  - "Last year, wireline networks handled 99% of U.S. video traffic and 98.4% of total U.S. data traffic. The share of traffic handled on mobile networks…will only represent about 5% of overall traffic in five years." *Gardner, USTelecom Testimony before Congress, July 25, 2013.*
  - Claims of competition from "alternatives that ride over-the-top of a broadband connection ignore[] the dearth of competition in the underlying broadband market…For most consumers, the underlying technology platform associated with the wireline broadband is a duopoly ***at best***." *NASUCA, Nov. 15, 2013, pp. i and 16.*

Verizon Business to Ofcom:

"As a Communications Provider solely offering services to the business sector, wholesale access products are very important to Verizon and therefore the availability of such products, at competitive prices, remains critical to our business model. As such, Verizon holds the view that continued regulatory controls must remain in place to safeguard access to the necessary wholesale inputs and thereby support competition to the benefit of customers."

Interconnection Provisions of Act are Technology Neutral

- FCC has found that "…section 251 of the Act is one of the key provisions specifying interconnection requirements, and that its interconnection requirements are technology neutral – they do not vary based on whether one or both of the interconnecting providers is using TDM, IP, or another technology in their underlying networks." *FCC 11-161*, ¶ 1342
- The "interconnection obligations of sections 251(a) and 251(c)(2) apply to incumbents' packet-switched telecommunications networks and the telecommunications services offered over them." *FCC 98-188*, ¶48
- In determining AT&T's phone-to-phone IP telephony service was a telecommunications service, the FCC found that the transporting of a call over the Internet backbone does NOT render it an information service. *FCC 04-97*

Interconnection Provisions of Act Provide for Negotiations with Regulatory Backstop

Key Provisions:

- All carriers have obligation to interconnect with others.
- All LECs must exchange traffic on reciprocal terms.
- ILECs (which have a substantially large footprint and customer-base) must provide POI where technically feasible on reasonable terms.
- Carriers can opt-in to existing agreements, providing for non-discrimination and cost savings on negotiation.

Positive Impacts:

- Encourages good-faith negotiations.
- Avoids standstill and bad faith tactics.
- Addresses uneven bargaining power.
- Prevents discrimination through public disclosure and opt-in.

Peering &Transit Agreement ≠ ICA

Internet Service/Backbone Network

- Addressing structure: Routable anywhere in the world
- QoS: Best efforts
- Service requires Internet Access

Facilities Based ("Managed") Service/Last-mile Broadband Access Network

- Addressing structure: Routable within carrier network with permission (**bottleneck**)
- QoS: Managed
- Customer Interface is not the Internet. Typically, it is analog voice for residential ; Ethernet or DS1 for business (see diagrams)

The Issue is Ripe for FCC Action

- NARUC adopted resolution in 2008.
- COMPTEL requested FCC address IP interconnection in 2009.
- National Broadband Plan stated "[t]he FCC should clarify interconnection rights and obligations and encourage the shift to IP-to-IP interconnection where efficient." Recommendation 4.10, at 49.
- FCC Requested comment in *USF/ICC Transformation Order and FNPRM* in 2011.
- FCC Technical Advisory Committee ("TAC"):
  - "VoIP Interconnection is growing in the USA due to efforts by MSOs and CLECs…but is largely being delayed due to commercial and policy considerations."
  - "The FCC has established a significant record on this issue in response to the further notice. The FCC should answer the question of whether section 251 requirements apply to VoIP interconnection."

    TAC Memo-VoIP Interconnection, Sept. 24, 2012

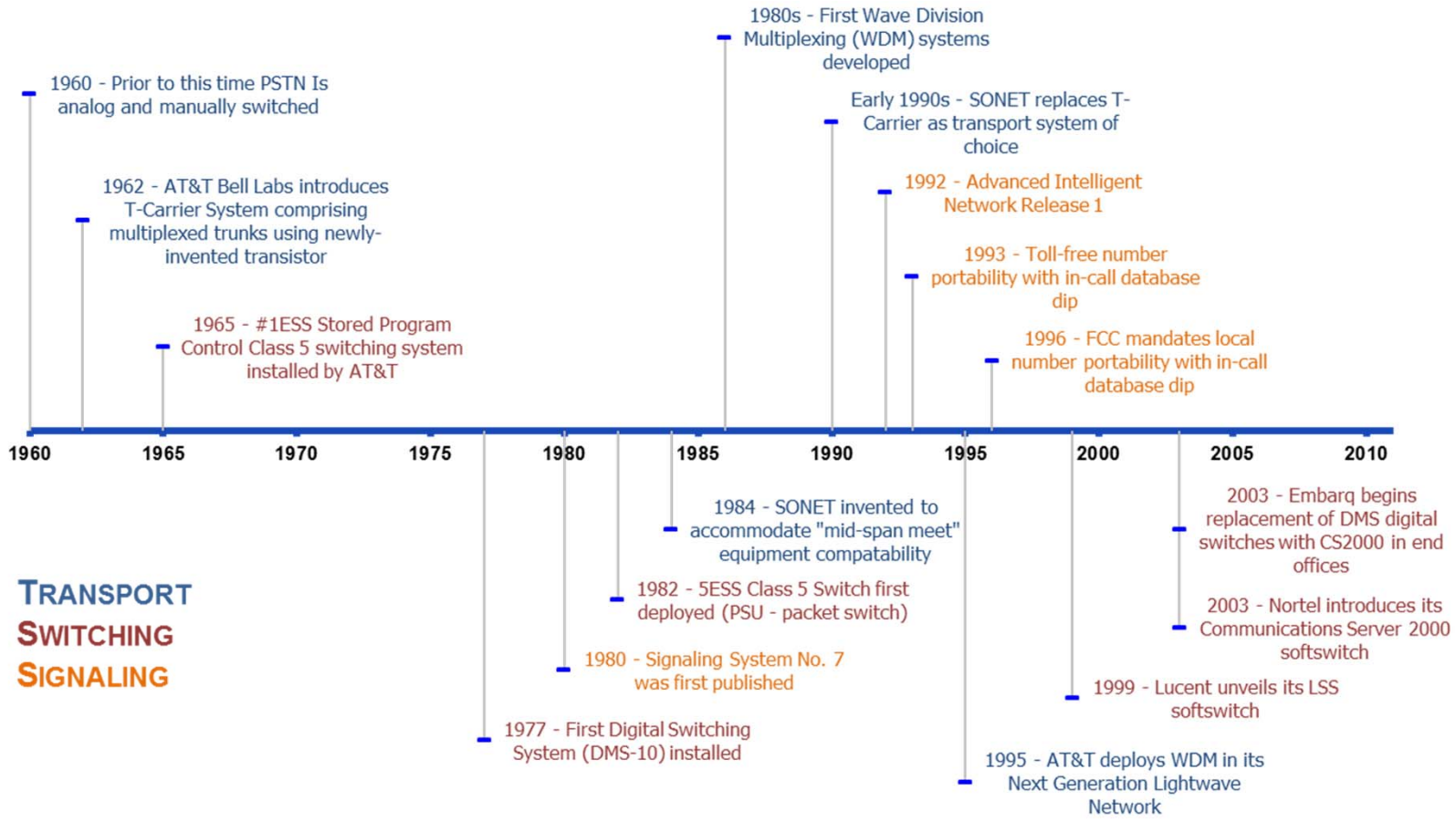
Advantages of Incumbency Still Persist

- IP technology does not allow competitor to bypass large ILEC last mile bottleneck.
- Extensive, ubiquitous footprint.
  - Already has conduits, poles, rights of way agreements.
  - Substantial advantage in serving multi-location customers.
- Scale advantages of largest market share of largest ILECs.

Transition of PSTN from TDM to IP Technology

Some Basic Facts

Technological Evolution in the Telephone Network is Commonplace



There is Still One Physical Network

- IP is a software protocol – NOT a physical network.
- Just as with TDM, IP is offered over copper, fiber or wireless facilities.
- Physical layer, which is comprised of costly network components (e.g., conduits, poles, fiber/copper transmission links) are used (and shared) by both IP and TDM technologies.
  - Not unusual for capex to be expended on facilities that are capable of supporting both IP and TDM services.
- Same physical *facilities* support various types of *logical* networks, e.g., unmanaged network (Internet) and managed networks (managed VoIP and TV services).

VoIP Services ≠ an Internet Service

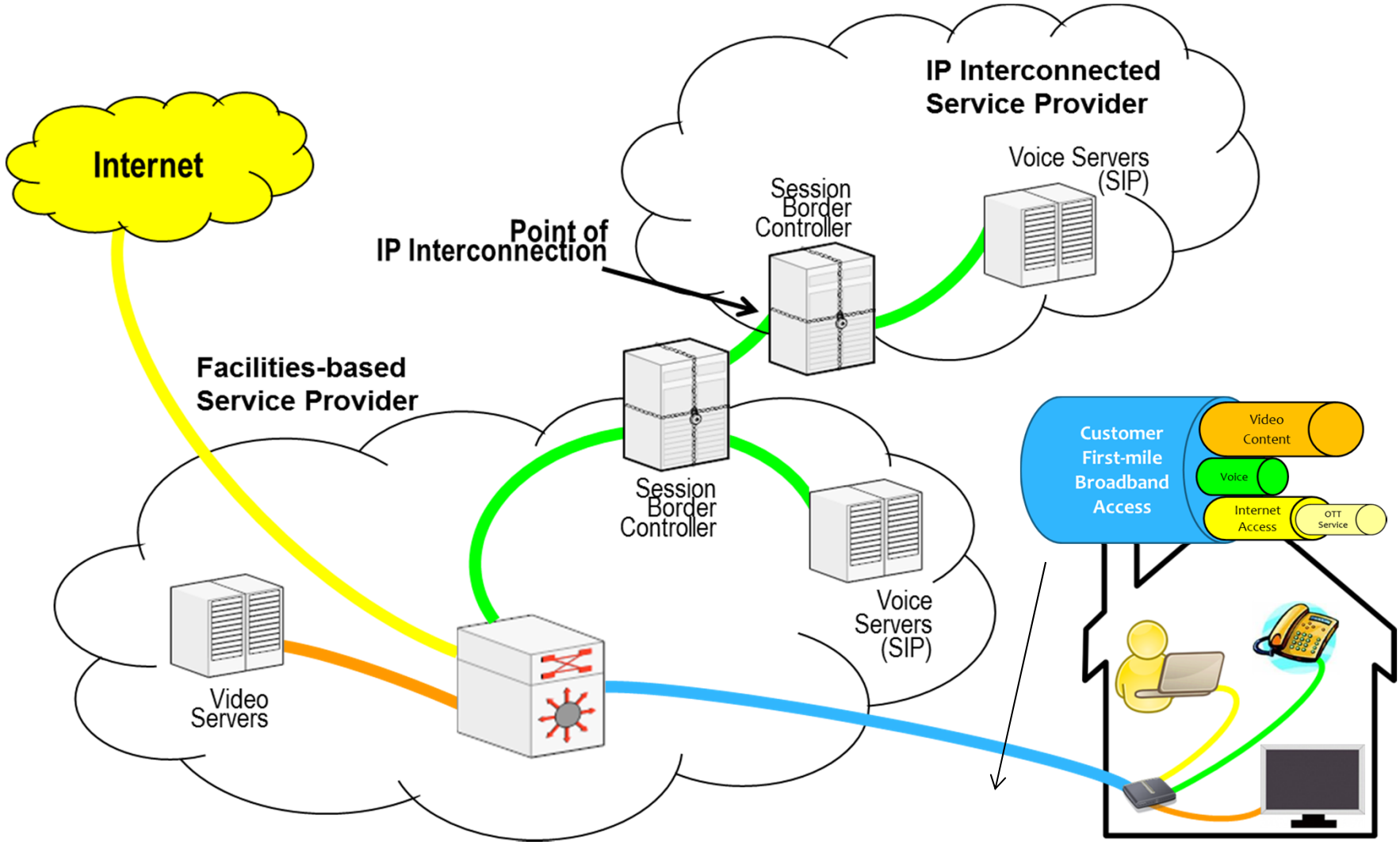
- **90% of VoIP services are managed services; Only 10% are offered via the Internet, i.e., over-the-top services.** *See* Nov 2013 Local Competition Report, Fig. 5

- Verizon: "To understand the features and quality of FiOS Digital Voice, you first need to know that the service is not the same as the services you get with a little Internet adapter for your modem and phone, ***and it does not ever touch the public Internet***." http://newscenter.verizon.com/press-releases/verizon/2010/fios-digital-voice-heres.html

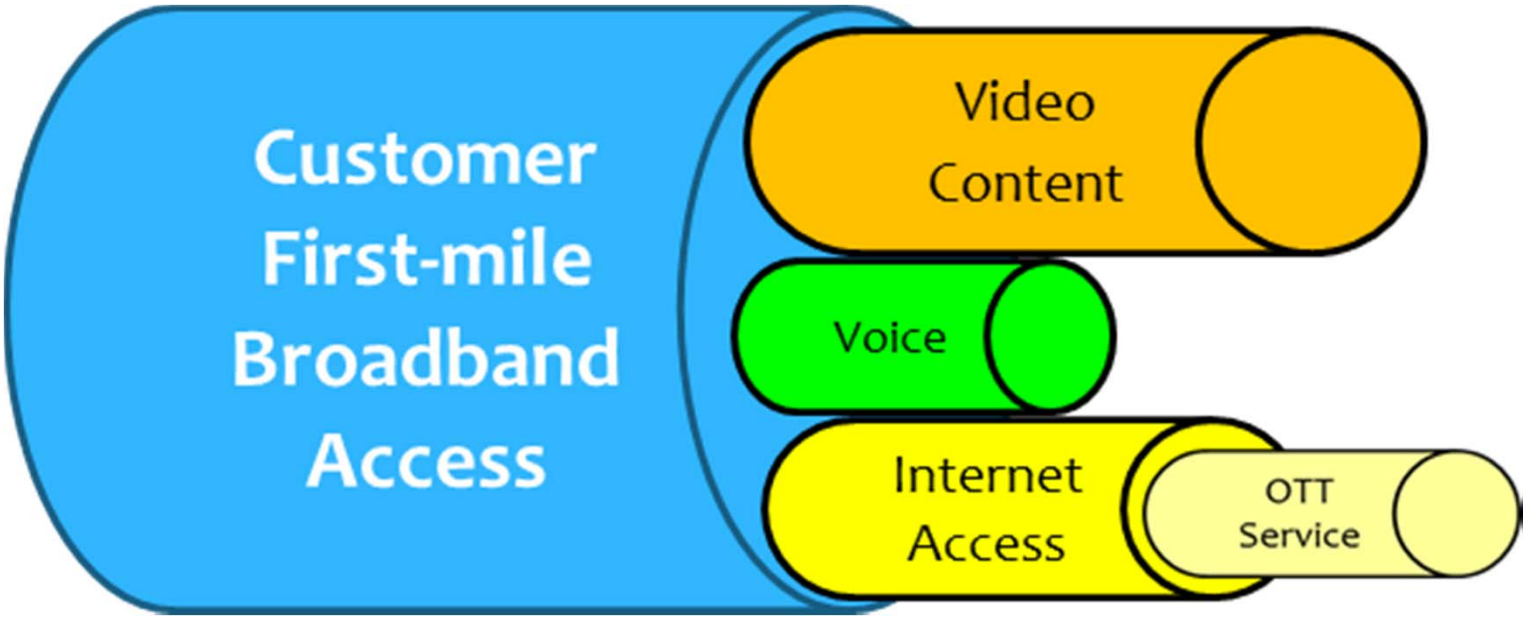
- AT&T: "AT&T U-verse Voice service is provided over AT&T's world-class managed network and not the public Internet. Using one network to provide U-verse services enables AT&T to provide high quality service. Voice over IP ("VoIP") providers who utilize the public Internet are less able to control the traffic and ensure voice quality." http://www.att.com/u-verse/explore/home-alarm.jsp

- Cable and traditional CLEC services are also managed VoIP services.

Facilities-based VoIP
Over Managed (Closed) Network



No Internet Access Required (unlike OTT)

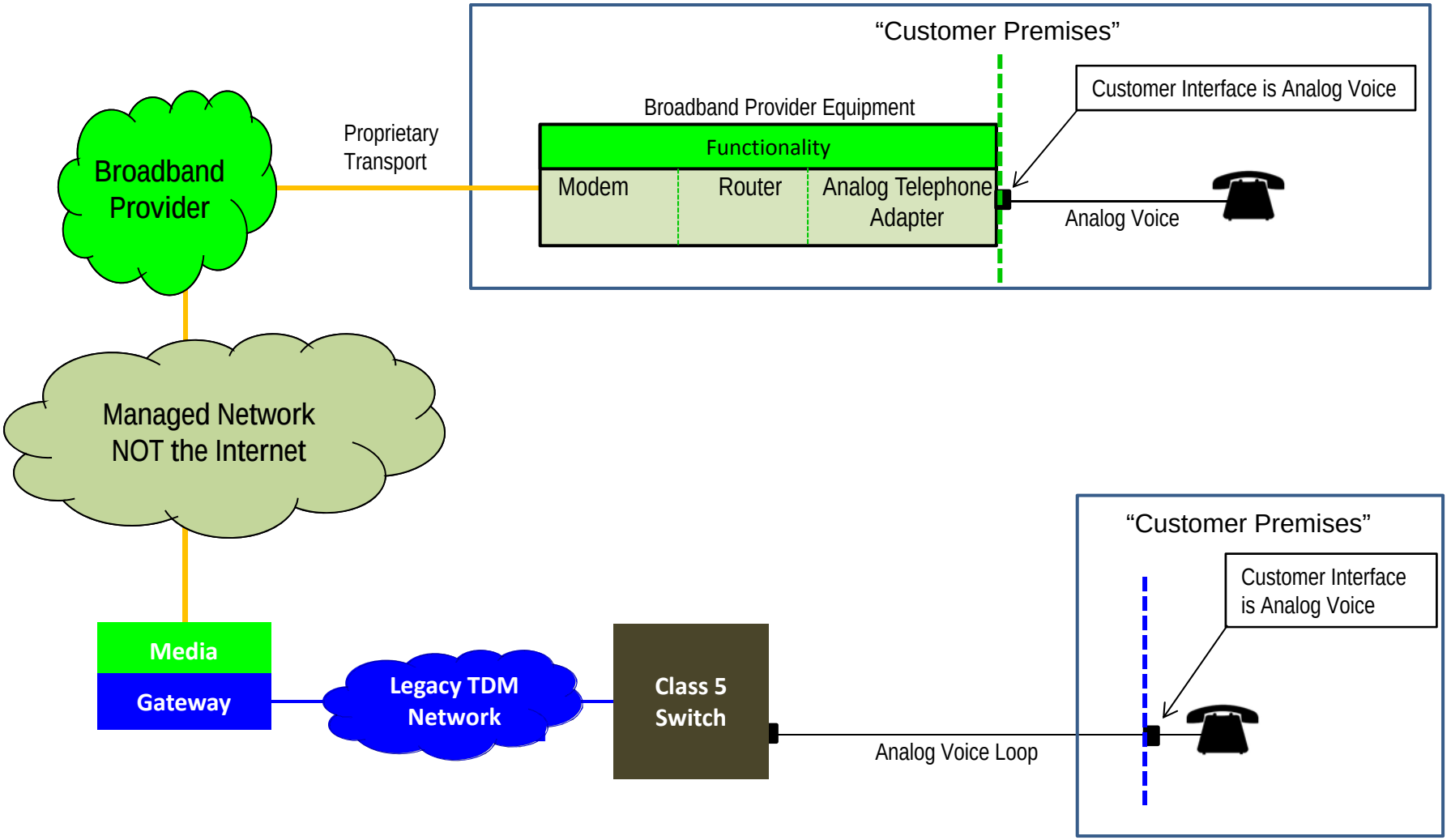


Nature of the Service Does Not Change with Technology

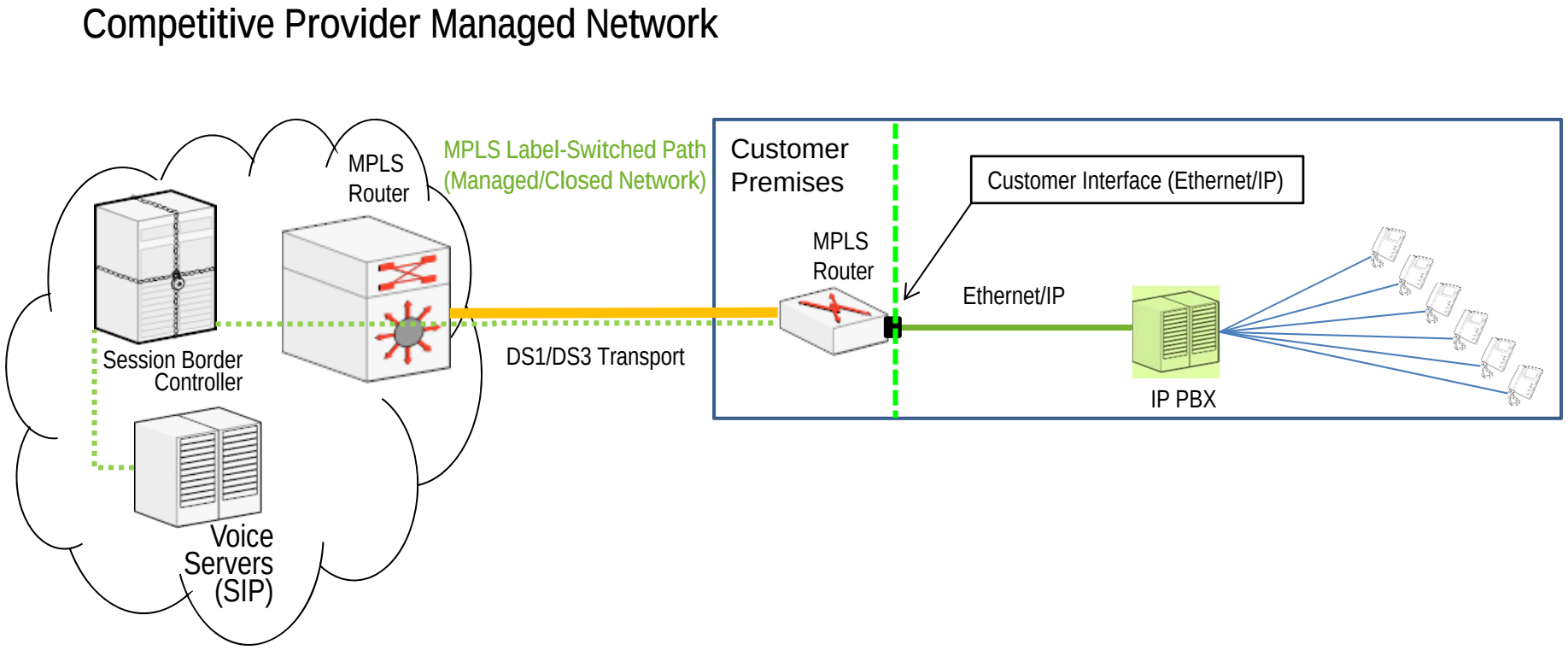
- Consumers unlikely to view managed VoIP provided by a cable provider, ILEC or CLEC any differently from traditional phone service.

- VoIP service still just providing transmission of voice communication.

Facilities-based VoIP with Broadband Provider Equipment

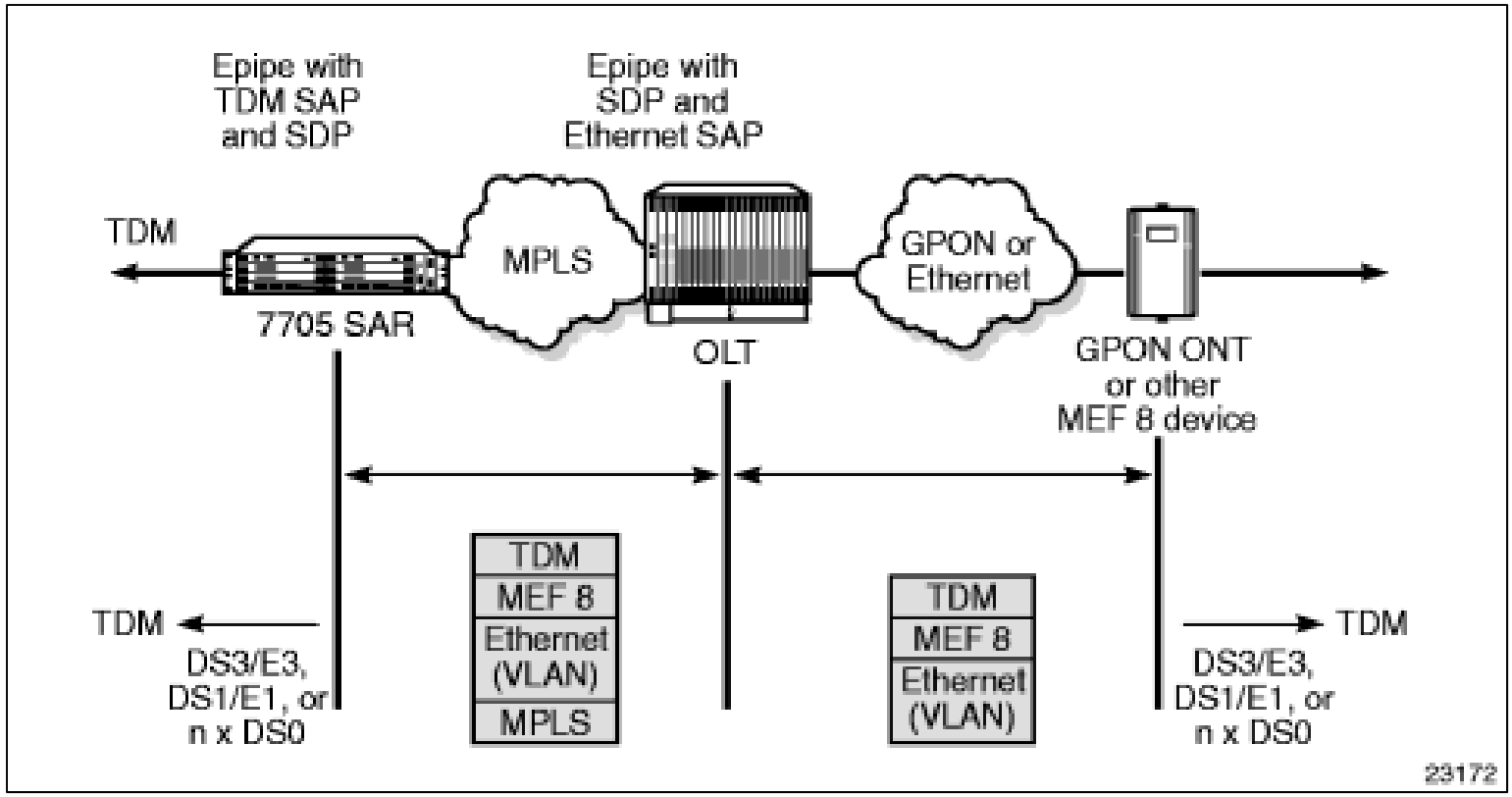


Facilities-based VoIP for Business Subscribers



TDM Special Access is Critical, and Inexpensive to Provide using Circuit Emulation Service (CES) over IP

RBOCs Can Easily Offer TDM Services over IP Networks, so no need to eliminate long term contracts for DS1s and DS3s



Alcatel-Lucent:
https://infocenter.alcatel-lucent.com/public/SAR60R2/index.jsp?topic=%2Fcom.sar.services%2Fhtml%2Fvllservice.html

CLECs Provide Tailored Solutions

Examples of Savings/Offerings Facilitated by IP Technology:

- ✓ No up-front cost for PBX
- ✓ No staff for “non-core” activities (IT)
- ✓ Lower monthly costs by 30%
- ✓ Scalable solution
- ✓ Avoid technical obsolescence

Next Steps for FCC

- Confirm Act's interconnection rights using IP facilities.
  - IP interconnection for all voice traffic (i.e., end-user TDM or IP).

- Develop last-mile solution:
  - Complete outstanding special access mandatory data request.
  - Address market failures to ensure consumers have choice in providers and competition thrives.