



Seven Steps to a Successful Competitive VoIP Service

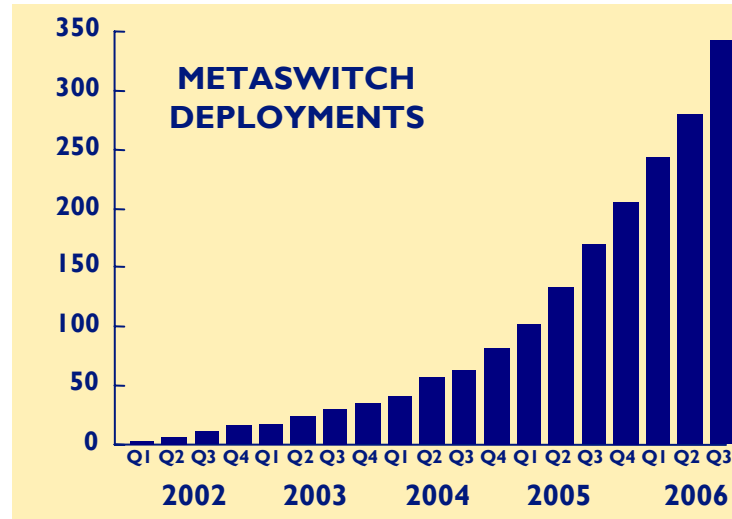
ITA Showcase Northwest
March 2007

MetaSwitch and Data Connection

- ✈ Division of established telecom vendor, Data Connection
 - Strategic technology supplier to major vendors and telcos since 1981
 - Stable, consistently profitable and privately owned

- ✈ Locations
 - Main US offices in California and Virginia, with 20+ remote sites
 - HQ and engineering in London

- ✈ MetaSwitch vision: *simplify delivery of next generation voice services*
 - Legacy & next gen
 - Technology that works
 - Responsive, committed support
 - Open interoperability and standards



Alameda, CA Offices

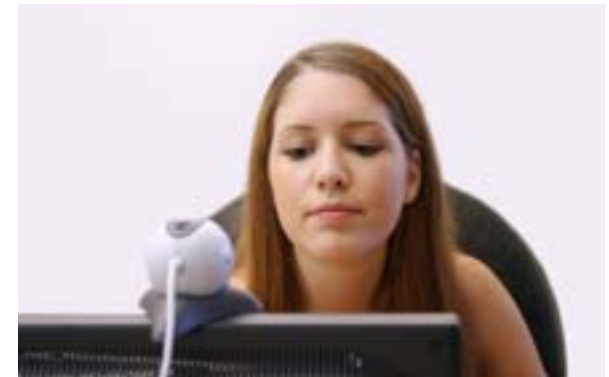
The Seven Steps

- 1. Market Analysis**
- 2. Reaching the Subscriber**
- 3. PSTN Service Equivalence**
- 4. Network Operations**
- 5. Quality of Service**
- 6. Network Optimization**
- 7. Sales and Marketing Execution**

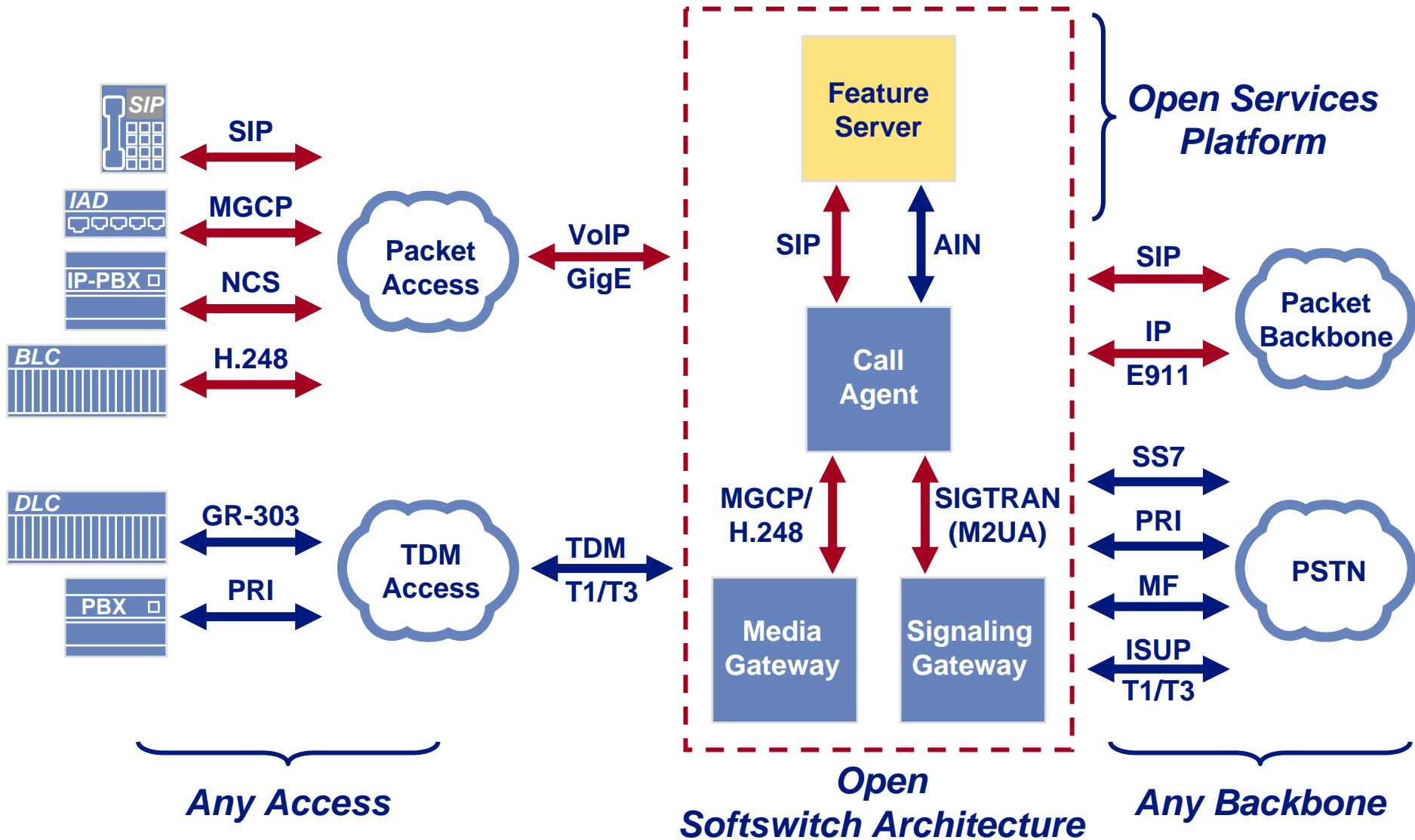


Market Analysis

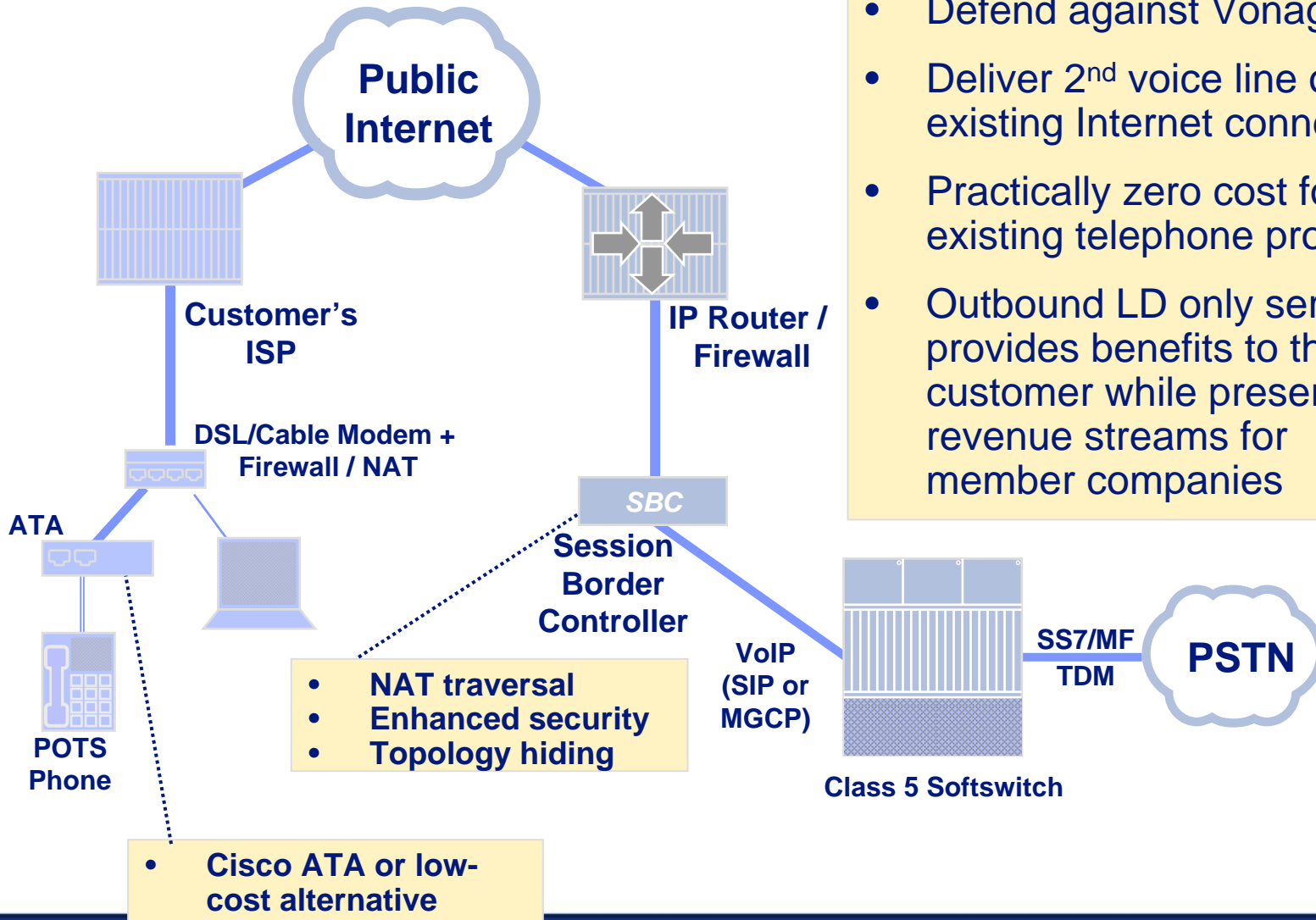
- Identify target markets
 - Business vs. Residential
- Identify services & capabilities
 - What services can you offer?
 - What are your limitations?
- Identify competition
 - Who else is serving the market?
 - How can you differentiate?
- Identify pricing and margin strategies
 - Ensure you have a viable business case



Open Softswitch Architecture Based on IMS

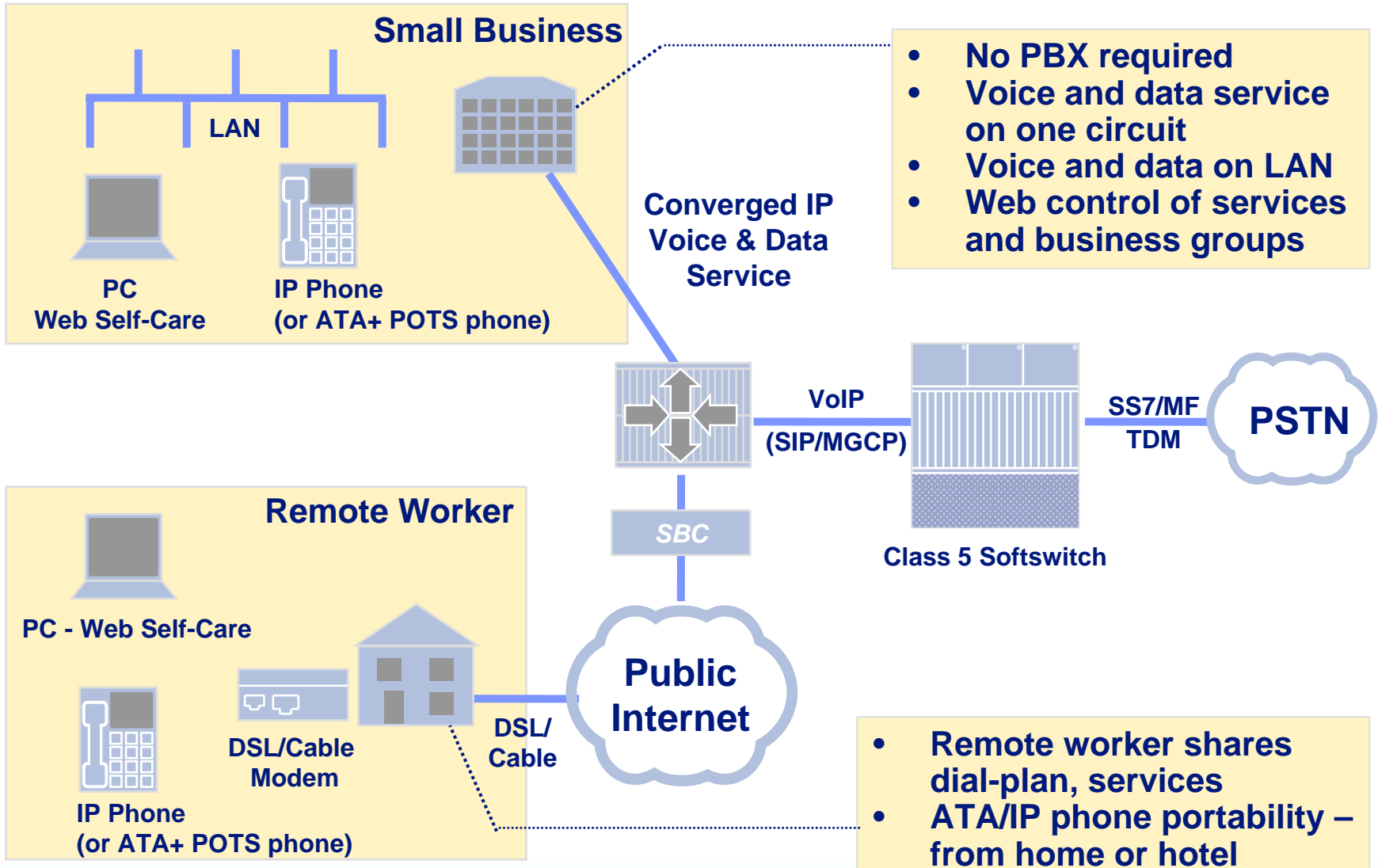


Residential VoIP (over Internet)



- Defend against Vonage
- Deliver 2nd voice line over existing Internet connection
- Practically zero cost for existing telephone provider
- Outbound LD only service provides benefits to the customer while preserving revenue streams for member companies

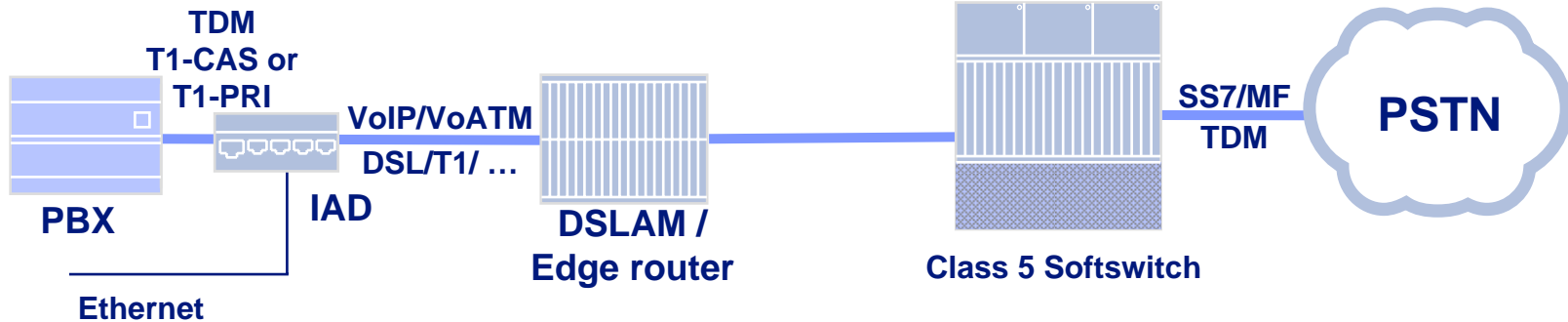
IP Centrex / PBX Replacement



Smart T

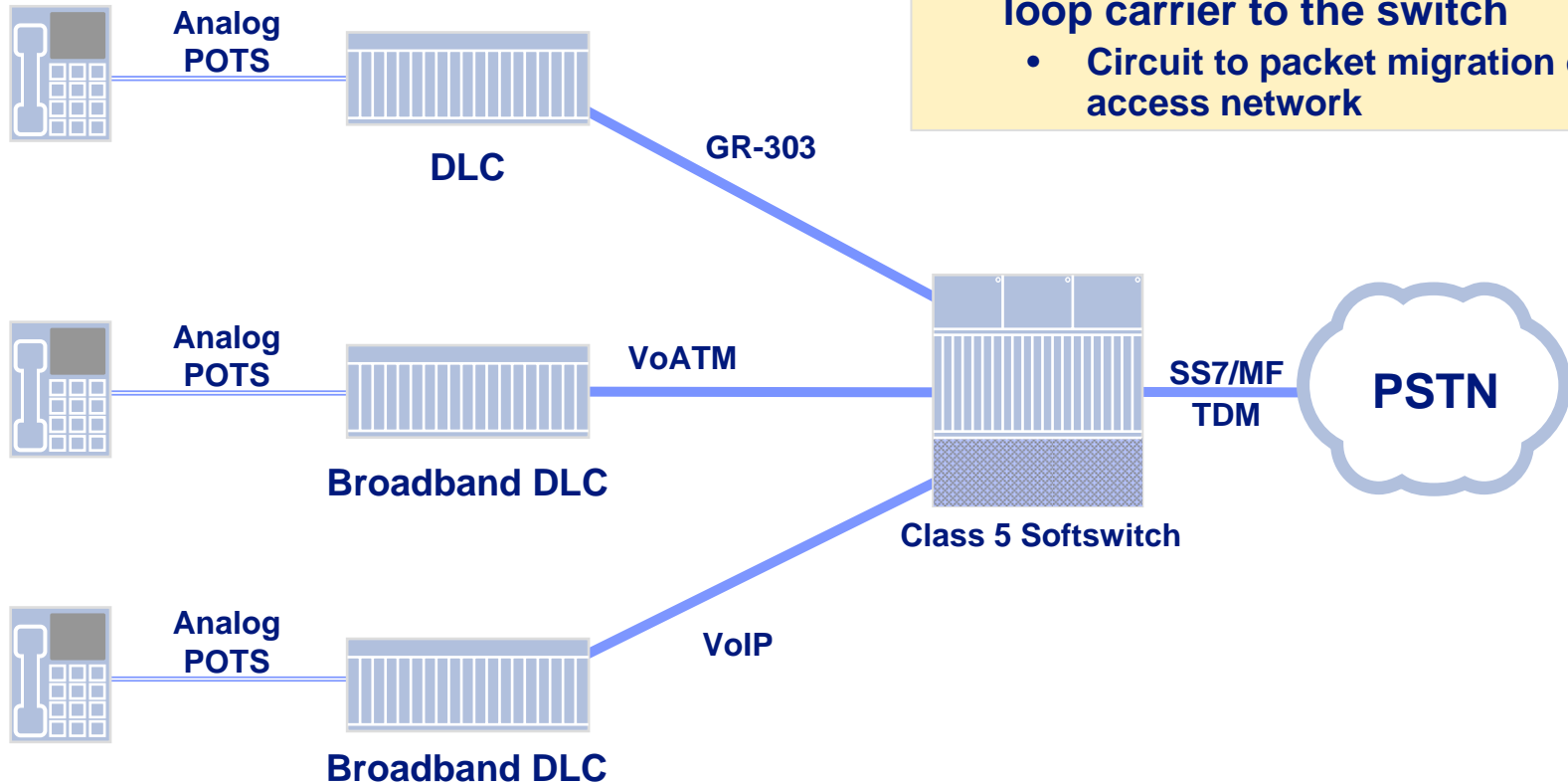
- Great solution for small / medium businesses

- Easy sale to customer
 - More for Less
 - Voice channels use less bandwidth
 - No bandwidth at all when not in use



Delivering Analog POTS Services

- Same traditional 2-wire POTS service to customer
- GR-303, IP or ATM from the loop carrier to the switch
 - Circuit to packet migration of access network

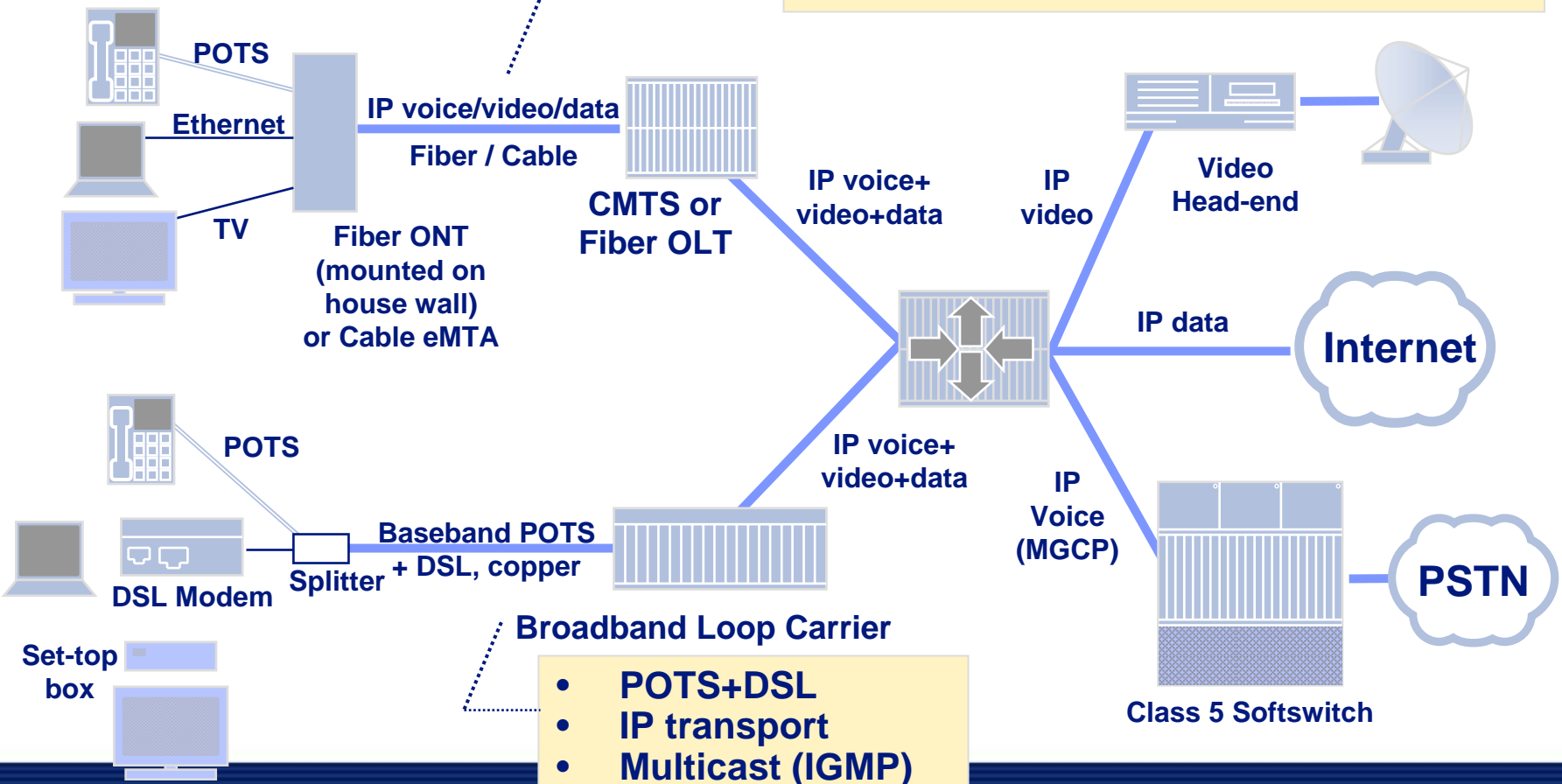


Step:
2

Triple Play over Copper / Fiber / Cable

- Fiber no more expensive than HFC
- 500Mb+ to the premise
- Analog or IP video

- Defensive move against cablecos
- Integrate video and phone services – caller name/number delivery via IP head-end



- POTS+DSL
- IP transport
- Multicast (IGMP)

Class 5 Features: Rich Service Set & More



Complete set of CLASS Residential & Business subscriber services

- Same features regardless of access interface/protocol
- Minimize the number of servers



“Everything else” required to be a true Class 5 switch

- Feature Group B/C/D
- Multiple local areas (NPAs)
- Customizable announcements
- SMDI/SS7 Voicemail interface and MWI
- 1-800, LNP (TCAP / SCCP)
- CNAM lookup via TCAP or IP
- Test calls and line identification
- E911, Operator and Directory Services (MF/SS7)
- Lawful interception (CALEA)

RESIDENTIAL


- Anonymous Call Rejection
- Automatic Callback (AC)
- Automatic Callback on Busy
- Automatic Recall (AR)
- Automatic Recall on Busy
- Busy Call Forwarding
- Call Forward Endpoint Unavailable
- Call Forwarding Unconditional
- Call Transfer
- Call Waiting
- Call Waiting Ringback
- Call Waiting with Calling Number Delivery
- Call Waiting with Calling Name Delivery
- Calling Name/Number Delivery via IP Video
- Calling Name Delivery
- Calling Name Delivery Blocking
- Calling Number Delivery
- Calling Number Delivery Blocking
- Cancel Call Waiting
- CLID Presentation Restriction
- CLID Erasure
- Code Restriction
- Customer Originated Trace
- Delay Call Forwarding
- Direct Outward Dial
- Distinctive Ringing
- Distinctive Ringing on Call Waiting
- Line Hunting
- Line Identification
- Message Center
- Message Waiting Indication
- Off-premise extension
- Outgoing Call Blocking
- PIN change
- Reminder Call
- Reminder Call Cancel
- Remote Access to Call Forwarding
- Screening List Editing
- Selective Call Acceptance

- Selective Call Forwarding
- Selective Call Rejection
- Simultaneous Ringing
- Single-party reverting ringing (home intercom)
- Speed Calling (1 digit)
- Speed Calling (2 digit)
- Teen line
- Three-way Calling
- Three-way Calling Ringback
- Toll Restriction
- Visual Message Waiting Indication

BUSINESS

- Account Codes
- Account code validation
- Announcement on inbound 1-800 calls
- Basic Business Group (BBG) Line
- BBG Auto. Identified Outward Dialing
- BBG Dialing Plan
- BBG Direct Inward Dialing
- BBG Direct Outward Dialing
- Call Hold
- Call Pick-Up
- Critical Interdigit Timing
- Directed Call Pickup Without Barge In
- Distinctive Ringing Intra/Extra BBG
- Do Not Disturb
- Find-me / Follow-me
- Intercom Dialing
- Intra/Extra BBG Caller ID
- MADN – single call appearance
- MADN – multiple call appearance
- Make Set Busy
- Multi-line Hunt Groups
- PBX Line
- PBX Line – Features
- Simulated Facility Groups
- Single-Digit Dialing
- Special Intercept Announcements

Regulatory Requirements! E911, CALEA & ???

-  **Enforcement Bureau Outlines Requirements of November 28, 2005 Interconnected Voice Over Internet Protocol 911 Compliance Letters.**

http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-05-2945A1.doc

-  **FCC ADOPTS ORDER TO ENABLE LAW ENFORCEMENT TO ACCESS CERTAIN BROADBAND AND VoIP PROVIDERS – May 3 2006**

http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-265221A1.doc

Network Operations: The EMS Advantage

- ✈ EMS Server aggregates management of multiple network elements
- ✈ Easy-to-use GUI client
 - Web install for Windows or Unix clients
 - Secure, permissions-based access
 - Complete system view for switch tech
 - Customizable tasks view for customer service representatives
- ✈ Open interfaces for OSS integration and flow-thru provisioning
 - SNMP, CORBA, XML, SOAP
- ✈ Billing – AMA GR-1100 format CDRs
 - Secure FTP export



VoIP Network Quality is a Systems Issue

TDM Network

Single service network

Centralized Arch – TDM Switch

Circuit Switch Transmission

Packet Network

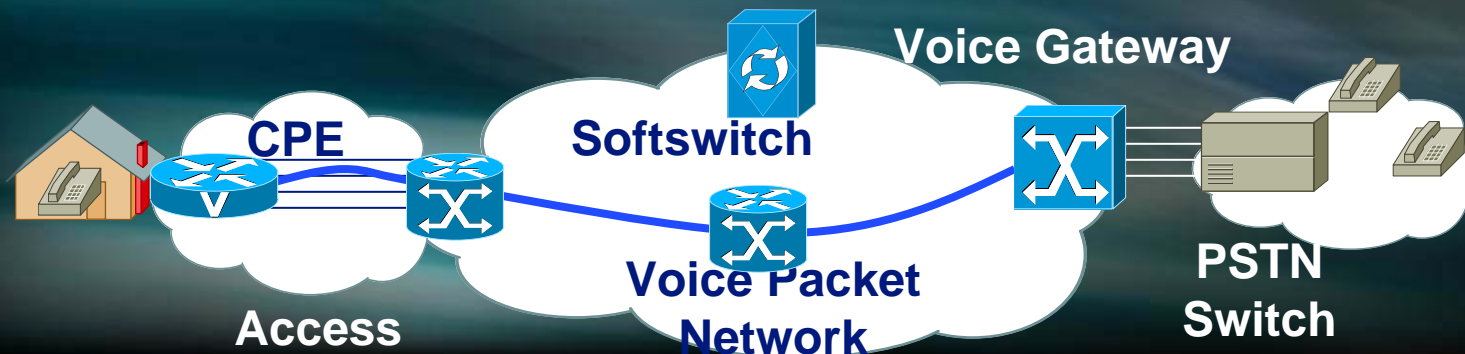
Multi-service Network

Distributed Architecture

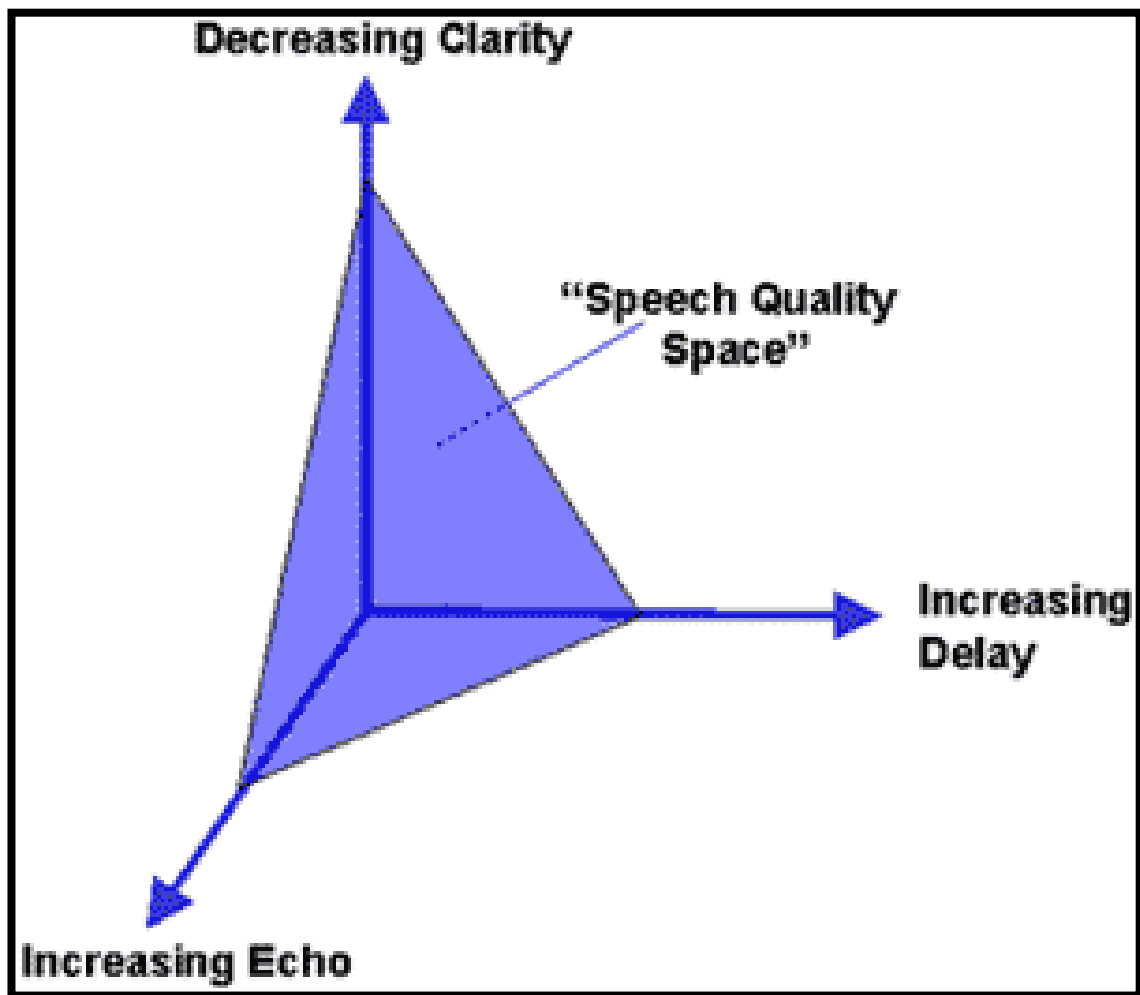
Packet Based Transmission

Voice Quality is a Systems Level Issue dependent upon:

- Quality of Underlying Infrastructure
- Network Design and Architecture
- Component Selection and Integration
- Operations and Management Practices



Factors Impacting Voice Quality



Key QoS Tools

- Customer, SP Edge, SP Core – Different tools for different needs
- Packet Classification (TOS / DSCP)
- Bandwidth
- Latency / Jitter Control – Per Hop Behavior
 - “Expedited Forwarding” == Strict priority queues for RTP packets (e.g. LLQ)
 - Better than “best effort” for VoIP signaling and control
 - Link Fragmentation and Interleave (LFI) for low speed links
- Admission Control
- Packet Loss

Sample DiffServ QoS Packet Classification

Traffic Class	DiffServ PHB	DiffServ DSCP Value
Broadcast Video	Assured Forwarding (AF)	AF41
VoD		AF42, AF43
Video Signaling	Class Selector (CS)	CS3
Voice	Expedited Forwarding (EF)	EF
Voice Signaling	Class Selector (CS)	CS3
Internet Access	Default	0

Network Architecture Considerations

- Managed IP Network vs. Public Internet

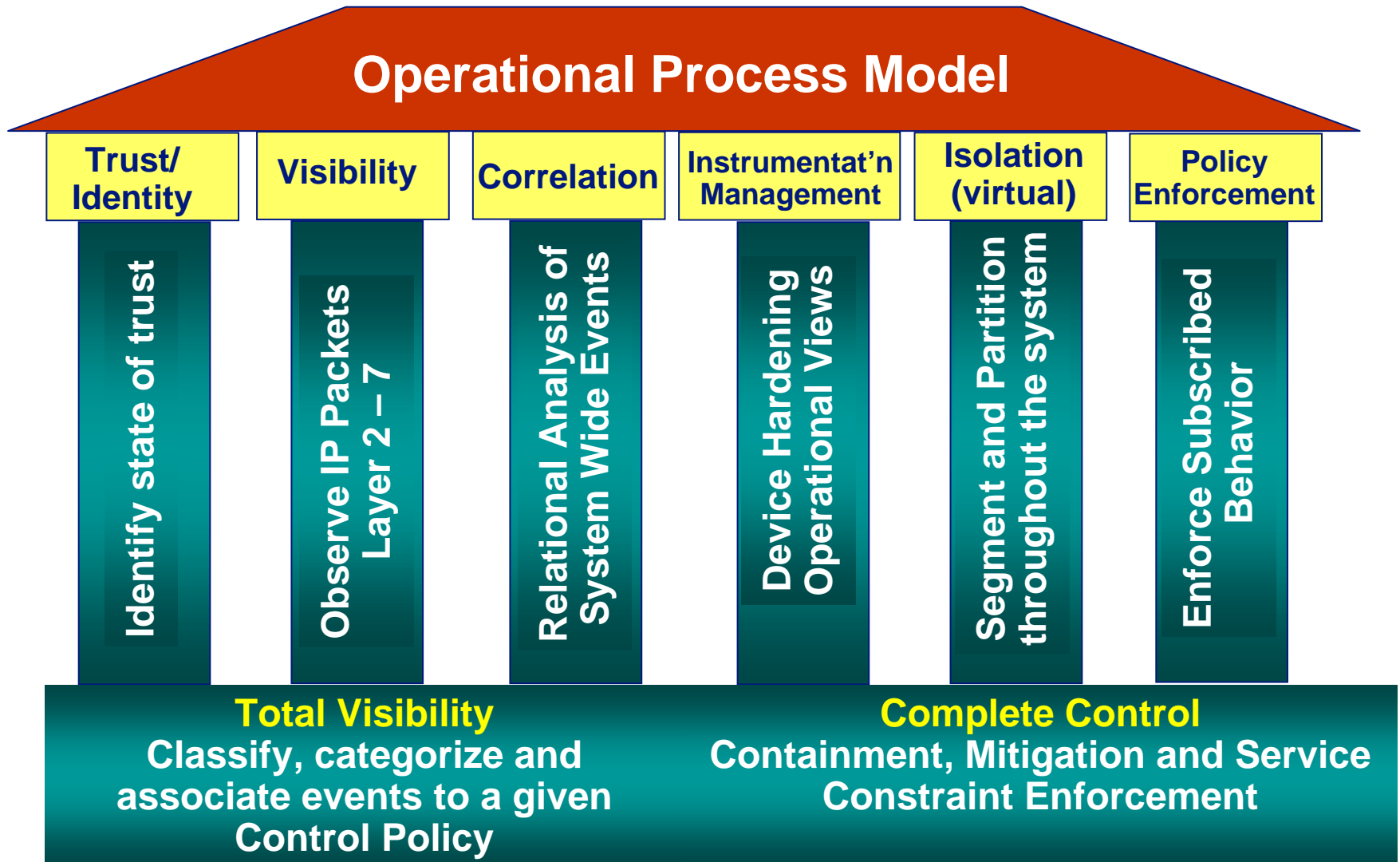
- Native IP – IPv4 (future IPv6)
vs.
IP/MultiProtocol Label Switching (MPLS)
MPLS Traffic Engineering (TE)
Diffserv Aware MPLS TE
MPLS TE Fast ReRoute (FRR)

Network Resiliency

- Not just device redundancy
 - In-device redundancy
 - Network design
 - Operational Practices

- Some Key Tools
 - Non Stop Forwarding (NSF) / Stateful Switchover
 - NSF aware IP routing– (e.g. OSPF Fast Restart)
 - AVOID Layer 2 Mechanisms (e.g. Spanning Tree)
 - MPLS TE Fast ReRoute – Link and Node Protection

Security – Defense in Depth



Sales & Marketing Execution

- ✈️ VoIP opens up a broad array of choices about which services to launch
 - Don't try to attempt everything at once – Keep it Simple!
 - Building strength through marketing is only partially about new features
- ✈️ Key imperatives
 - Identify / select target market
 - Address your target customers' needs
 - Understand the competitive forces
 - Build the relationship and brand image
- ✈️ Your brand is the *totality of what you say and do*



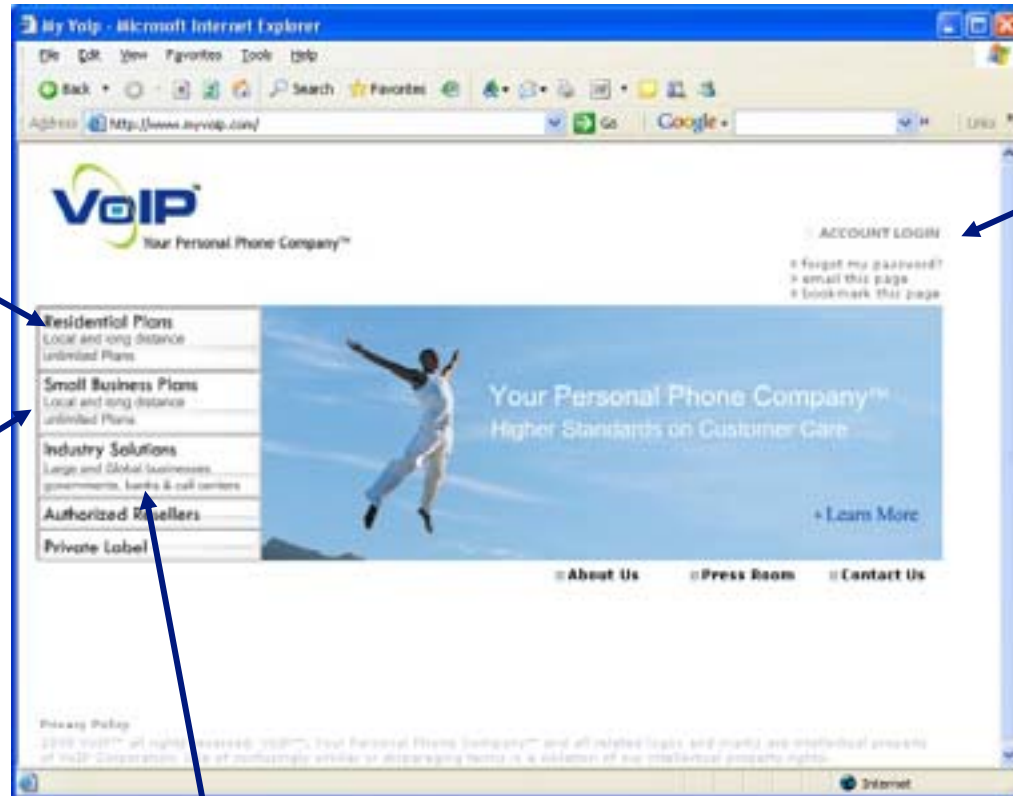
Case Study: VoIP Corp

Residential Offering

Branded Portal

Customers can:

- Check bills
- Control settings
- Access unified mailbox
- Sign up for features
- Etc.



Small Business Offering

Vertical Market Solutions

Thank you!



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Thanks for attending!