Interoperability and Troubleshooting between Peer-connected Services

Alan Clark
CEO, Telchemy

New Market Peering Conference 2007

Intro to Telchemy

- Leading provider of technology for VoIP and IPTV performance monitoring/ analysis
- Over 30 million VQmon software agents licensed to over 30 test equipment and 60 network/customer premise equipment vendors
- Leading role in the industry in the development of standards for VoIP and IPTV performance measurement and reporting

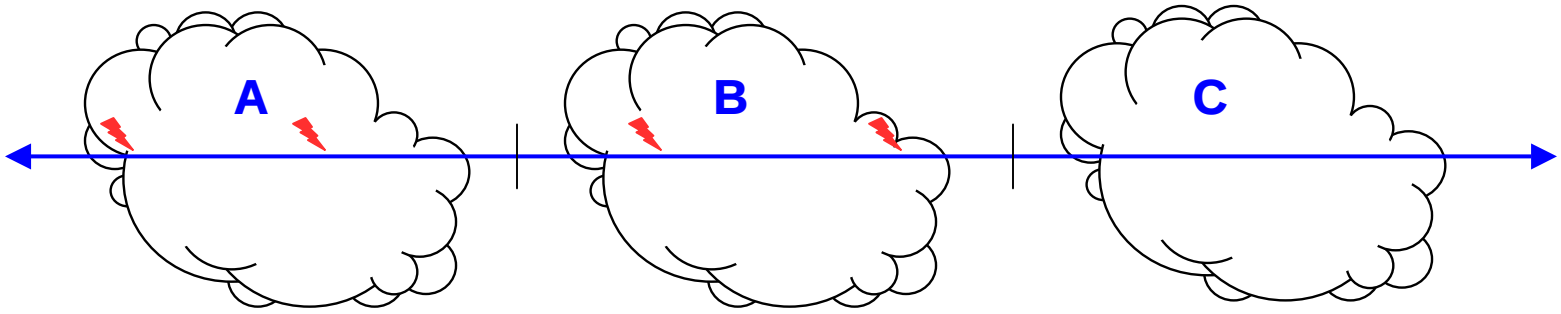
telchemy
Actively managing multimedia

Outline

- Service Quality – an End-to-End issue
- Do SLA's guarantee service quality?
- SBC's and Transcoding Gateways
- End-to-end performance monitoring
- Troubleshooting across Management Domains
- Looking forward - what else is needed?

telchemy
Actively managing multimedia

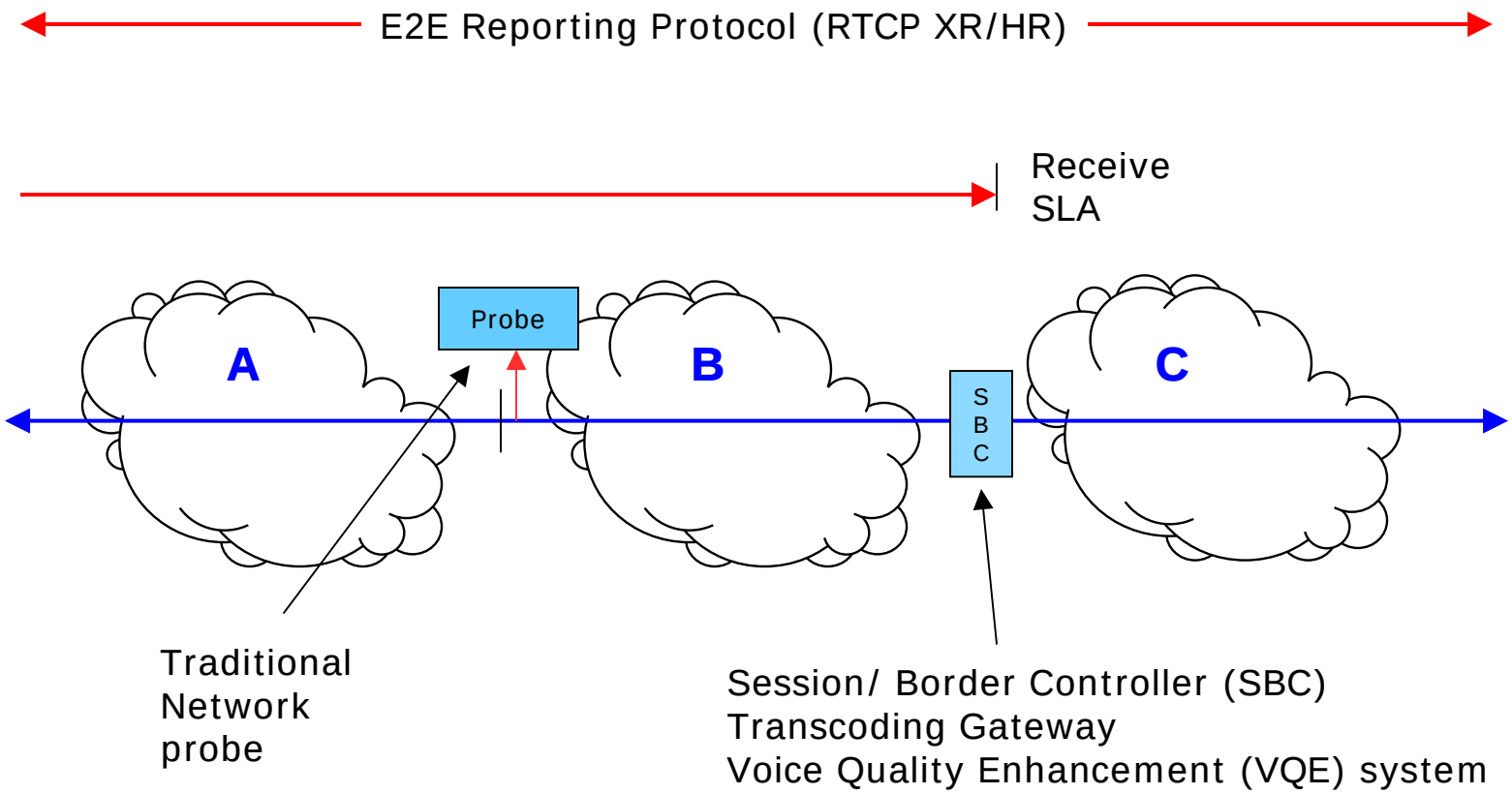
Service Quality – an End-to-End issue



- Quality problems could occur anywhere along the path however…
- …C's subscribers view C as responsible for service quality
- What can C do to ensure quality?

telchemy
Actively managing multimedia

Key components



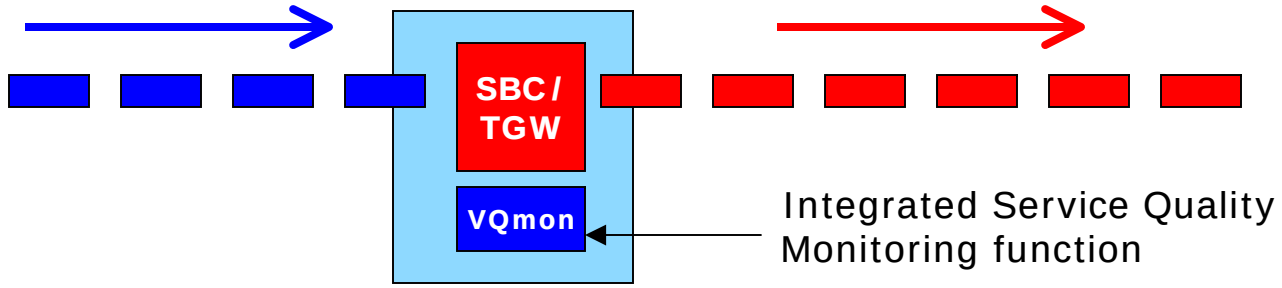
telchemy
Actively managing multimedia

Do SLA's guarantee service quality?

- Only if SLA
  - measures performance in terms that relate to user QoE
  - incorporates metrics related to transient problems
- Simple methods
  - Loss and Jitter
    - Generally inadequate (unless both are zero)
  - E Model
    - Inaccurate when quality is time varying
- QoE oriented methods - preferred
  - Extended E Model (VQmon)
    - Models impact of time varying IP impairments
    - Incorporates some payload data (signal, noise, echo)
  - TM Forum Degraded Service Quality Events
    - SLA expressed in terms of quality "events"
  - ITU-T P.563
    - Inaccurate for individual calls, complex, expensive

telchemy
Actively managing multimedia

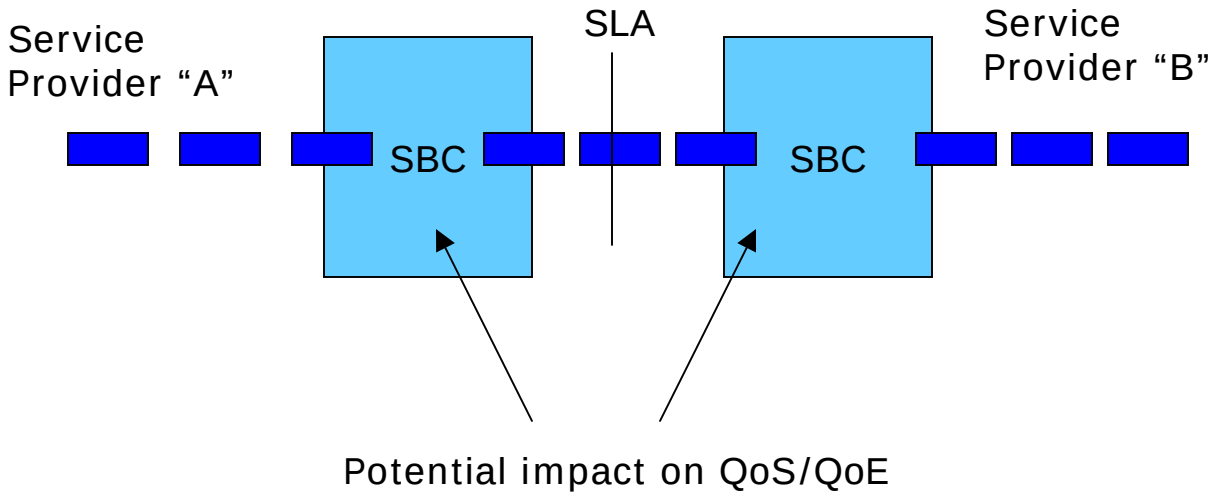
SBC's and Transcoding Gateways



- Pass RTP through (simple router/ firewall)
  - No impact on quality
- Logically terminate and recreate RTP stream
  - No impact on quality
- Transcode voice packets
  - No impact on IP impairments, may affect payload
- Terminate voice stream and recreate
  - IP impairments masked or converted to payload degradation
- Voice Quality Enhancement
  - IP impairments repaired, echo and noise reduction

telchemy
Actively managing multimedia

SBC's and Transcoding Gateways



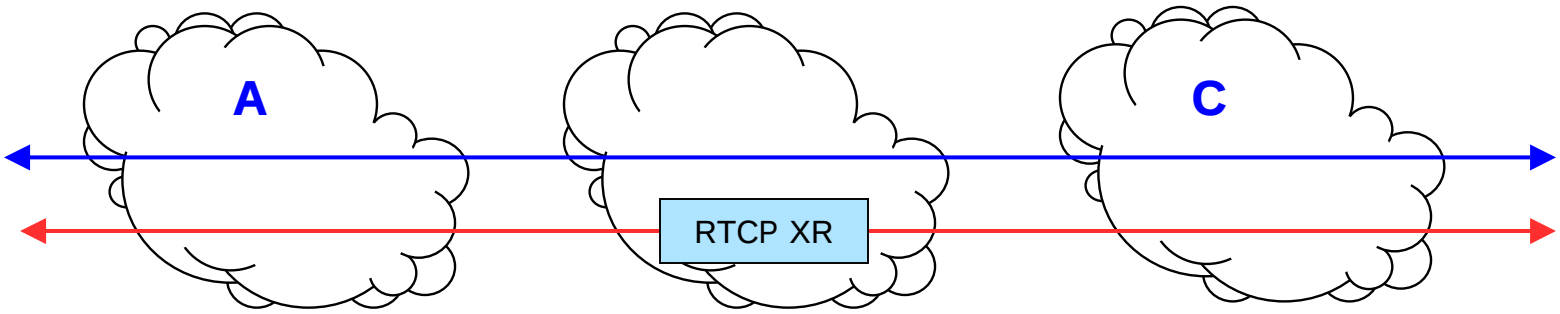
- Service provider needs to understand (per session) what impact SBC/ Transcoding Gateway is having on quality

- Either
  - Needs to be clearly defined
- Or
  - Service provider needs to monitor output from SBC
  - Ideally monitor ingress and egress

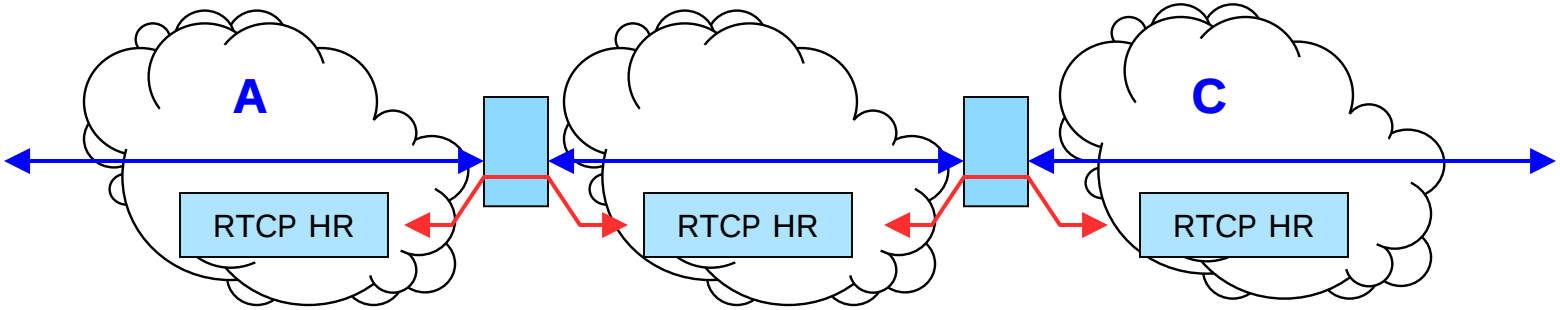
telchemy
Actively managing multimedia

End to End Performance Reporting Protocols

RTCP XR (RFC3611) – End-to-end orientation



RTCP HR (IETF Draft) – Segment orientation



telchemy
Actively managing multimedia

Problem diagnosis toolkit

- QoS/QoE metrics from interconnection points
  - Monitoring function embedded into SBC
- QoS/QoE metrics from endpoints
  - Monitoring function embedded into CPE
- End to End performance reporting protocols
  - RTCP XR/ RTCP HR
- Traditional network tests
  - ping, traceroute, pathchar
  - ICMP responses may be blocked or rate limited
- Active tests/ synthetic transactions
  - Can be designed to do both SLA monitoring and diagnostics
- Route state tracking / Router statistics tracking tools
  - May be blocked by SBC/Firewall

telchemy
Actively managing multimedia

What's the solution?

- Scenario
  - "A" interconnects with "B" and "B"'s subscribers report problems
  - B checks B's network to verify that problem is not local
  - B checks metrics from A-B interface to verify that problem appears to be in traffic originating from A
  - SLA appears to be met however B still believes there is a problem in the traffic coming from A
  - B retests B's network but still finds no problem
- Should B use network tools to attempt to diagnose problem in A's network?
  - Obviously not
- Should B be able to request test data from A or to request that A conduct a test?
  - Plausible but no such interface yet defined (?)

telchemy
Actively managing multimedia

What's the solution?

- Mindset change
  - It's in everyone's interest to improve service quality
- Accepted QoE oriented SLA's
  - Consider both IP and (ideally) payload impairments
  - Metrics related to transient impairments
  - Metrics that reflect quality *after* PLC and decoding
  - Know how SBCs are affecting quality
- Cooperative problem resolution
  - Exchange information that can help to resolve problems
  - Define "test interface" that allows service providers to request test data or to initiate active tests in peer connected services
  - Allow diagnostic traffic through SBC/ Firewall

telchemy
Actively managing multimedia

Summary

- Service Quality – an End-to-End issue
- Do SLA's guarantee service quality?
- SBC's and Transcoding Gateways
- End-to-end performance monitoring
- Troubleshooting across Management Domains
- Looking forward - what else is needed?

telchemy
Actively managing multimedia