



Unified, Cloud Based, Virtualized, Hosted


Managing ^ VoIP Quality and Performance

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Outline

- VoIP Performance Issues
- Current “state of the art” VoIP performance management
 - The new RFC6035 protocol
 - VoIP Performance Management Systems
- How can IP Centrex/ Hosted PBX Service Providers manage service quality?
 - Fault management
 - SLA monitoring
- Sounds great – where can I get it?

The top section of the slide features the Telchemy logo in a large, gold, serif font. Below it, the tagline "Actively Managing Multimedia" is written in a smaller, gold, italicized serif font. The background of this section is a grey gradient with a repeating pattern of the text "Let me tell you about what we are doing" in a small, light grey font.

Solving IP Centrex Customer Premise Management Problems

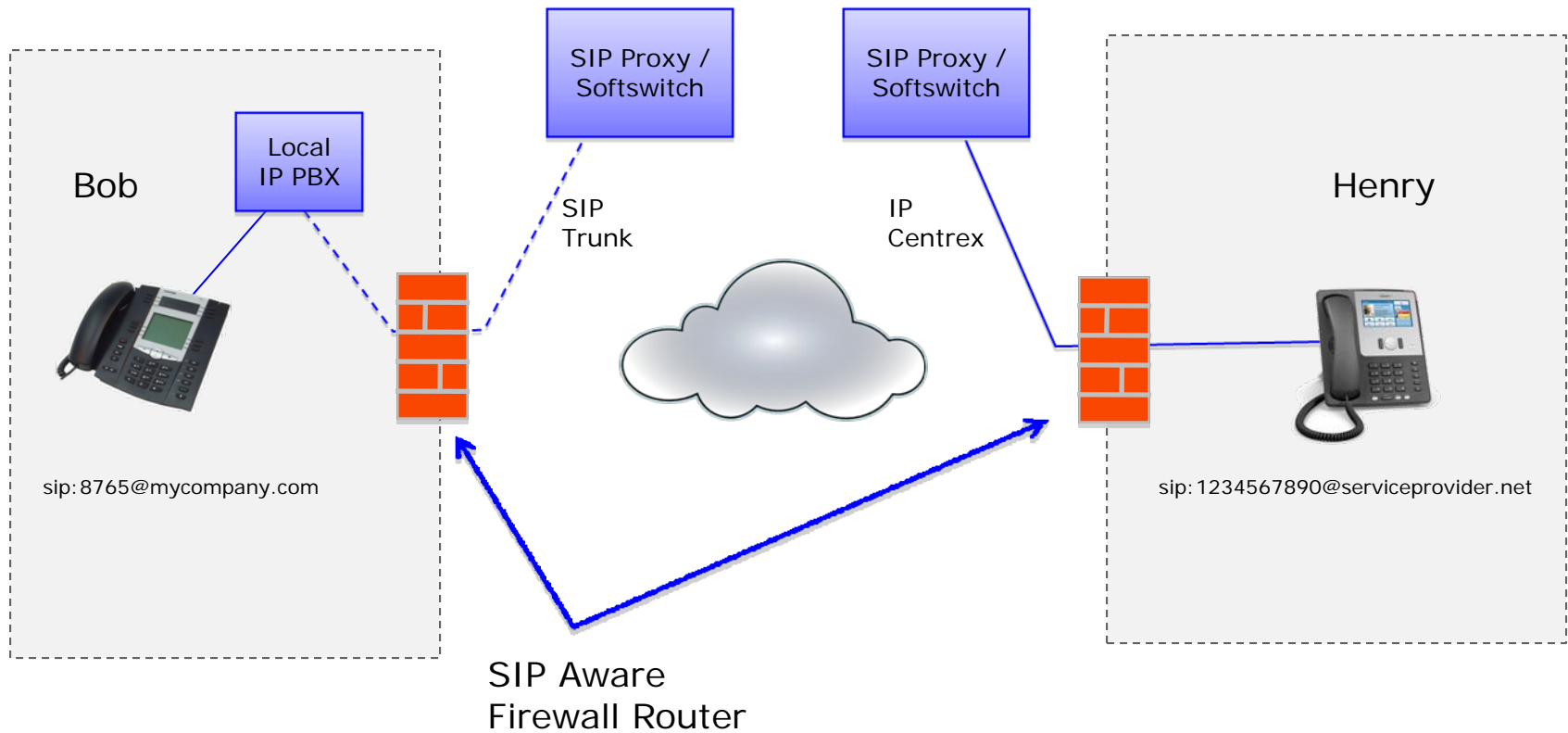
Alan Clark
President, Telchemy Incorporated

A small logo in the bottom right corner of the slide, featuring a green leaf-like shape with the word "pulver" in white and the number "100" in white, indicating an award.

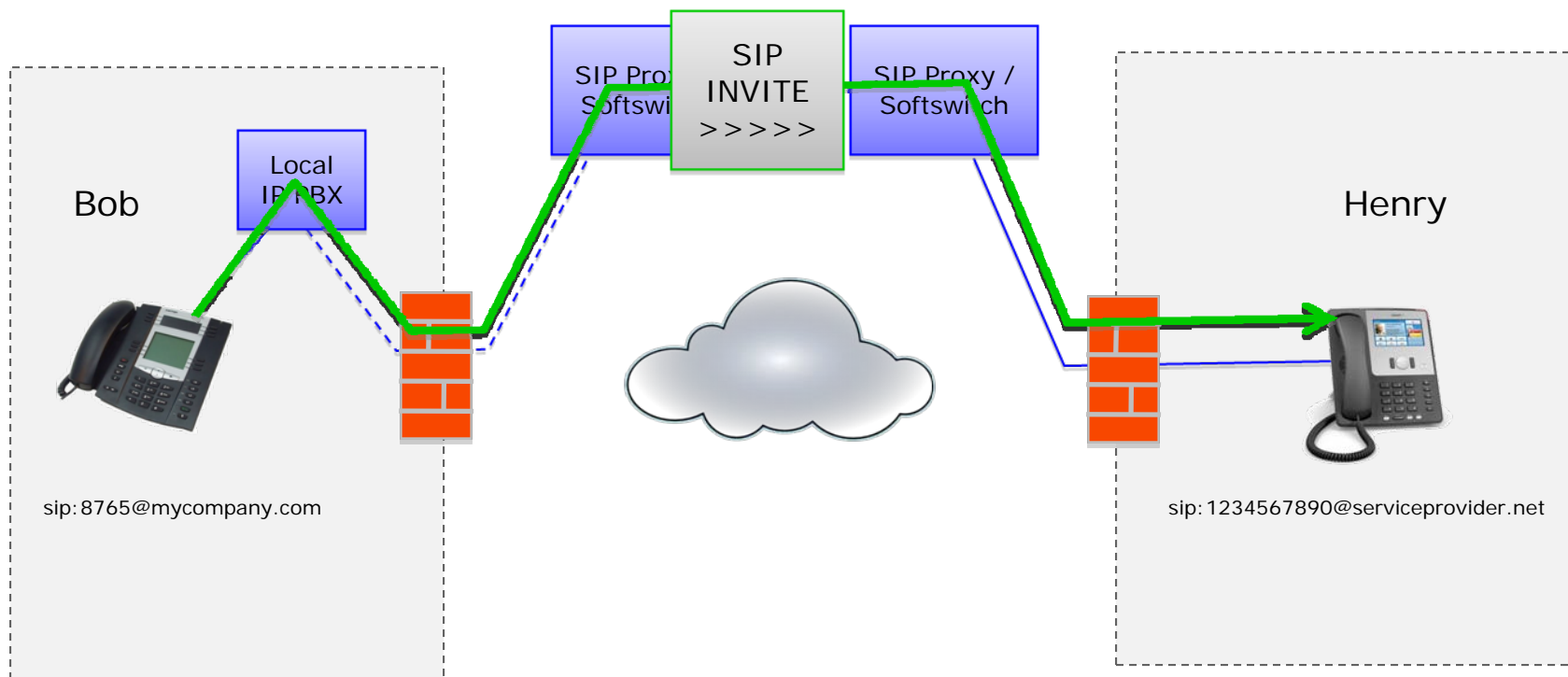
VoIP performance issues

- Media quality
 - Packet loss
 - Jitter
 - Signal and Noise levels
 - Codec distortion
- Conversational problems
 - Delay
 - Echo
- Signaling
 - Call setup failures
 - No-way or One-way voice
 - Dropped calls

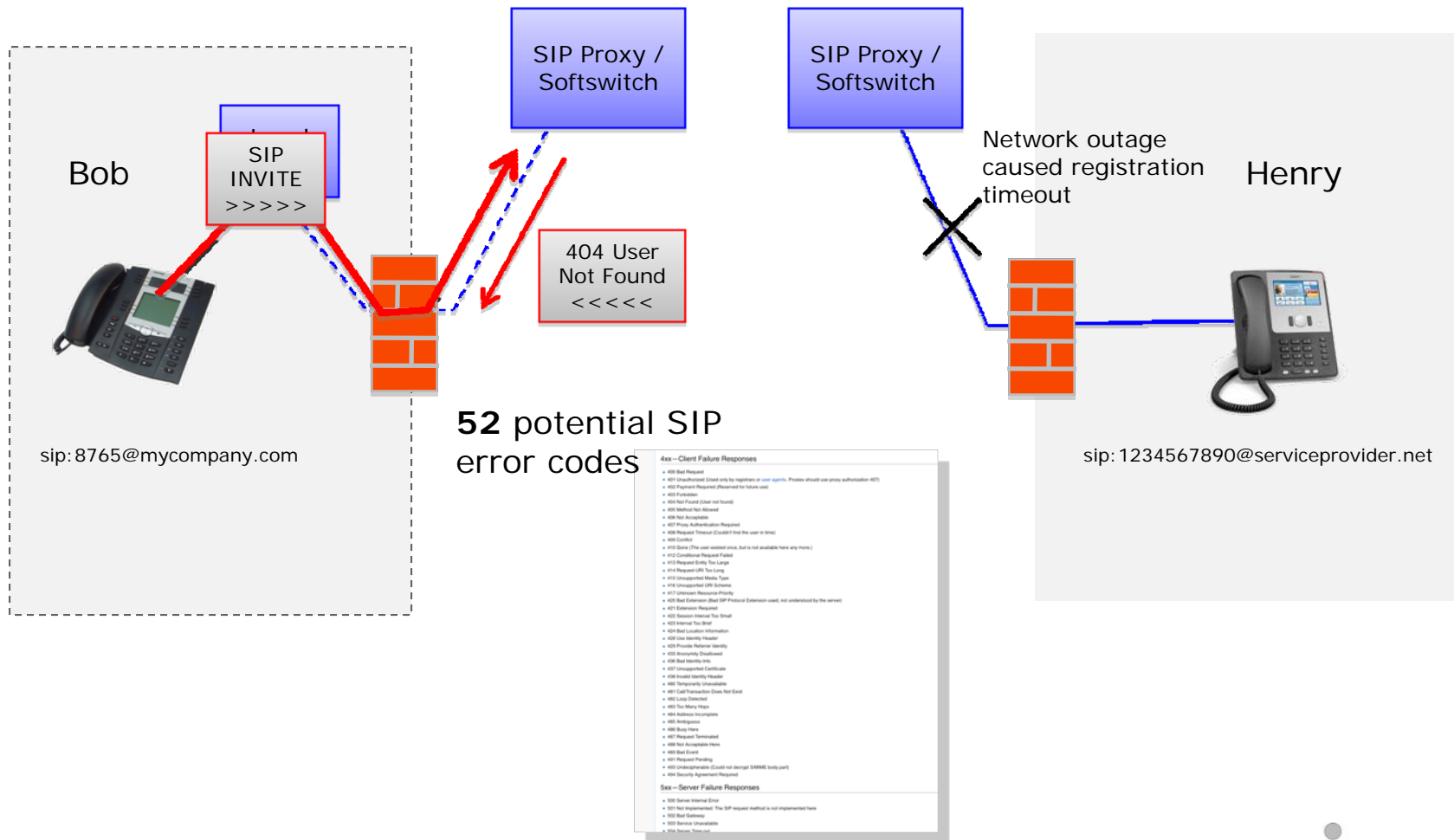
A day in the life of a VoIP Call



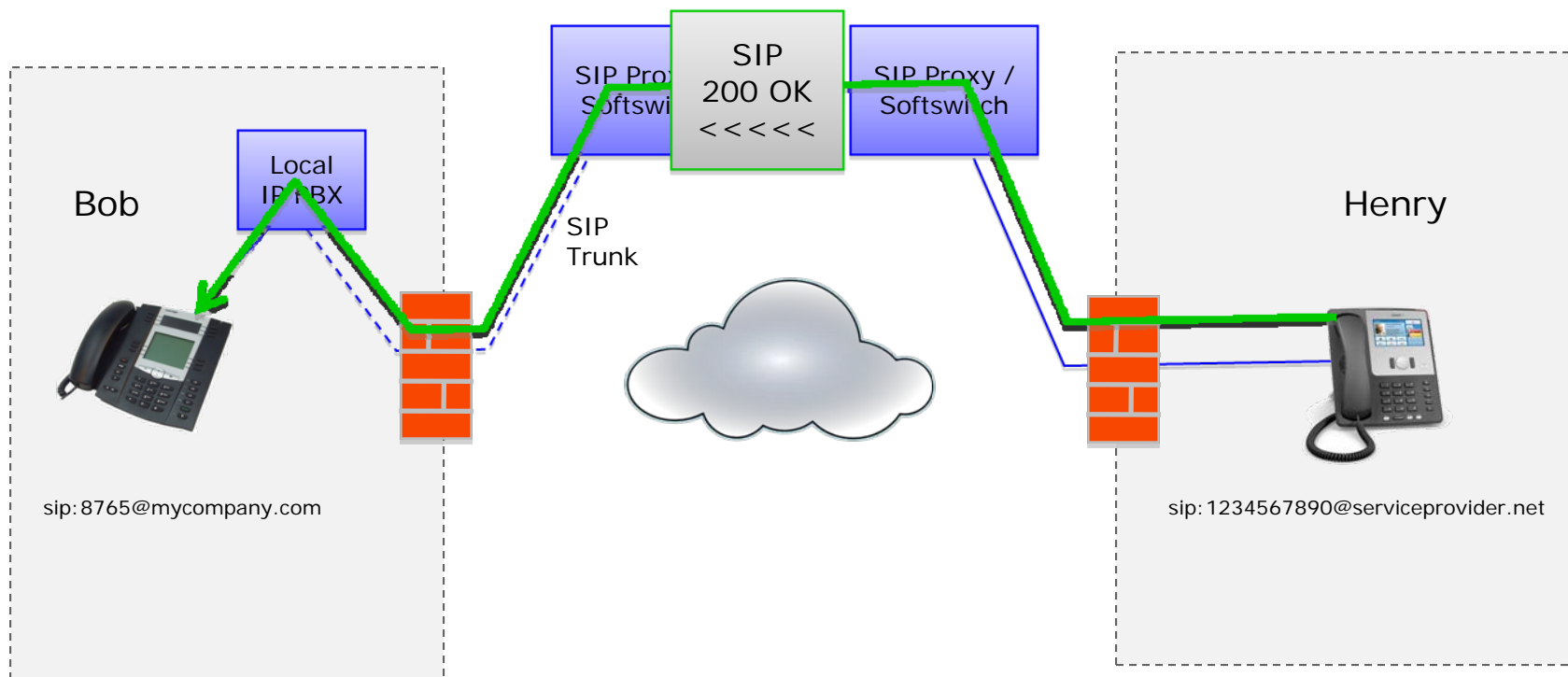
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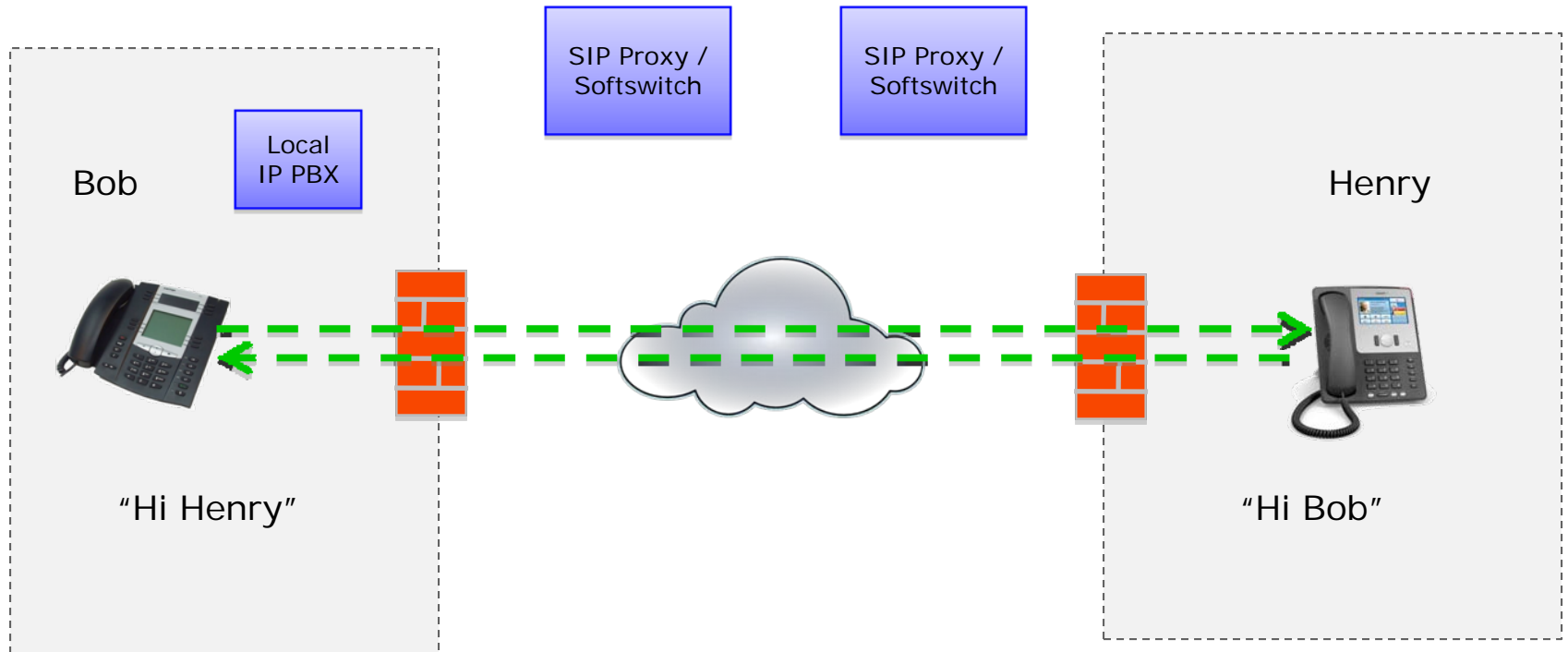
Bad A ^ day in the life of a VoIP Call



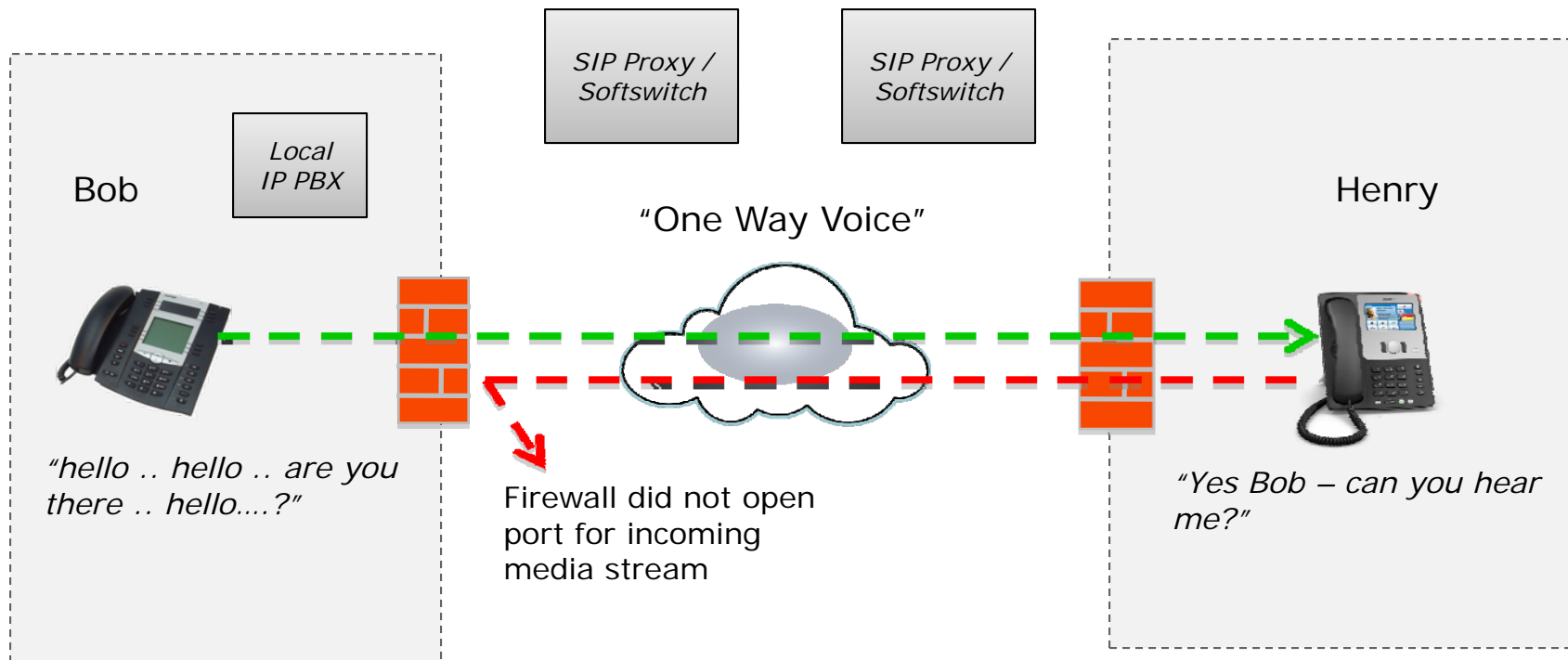
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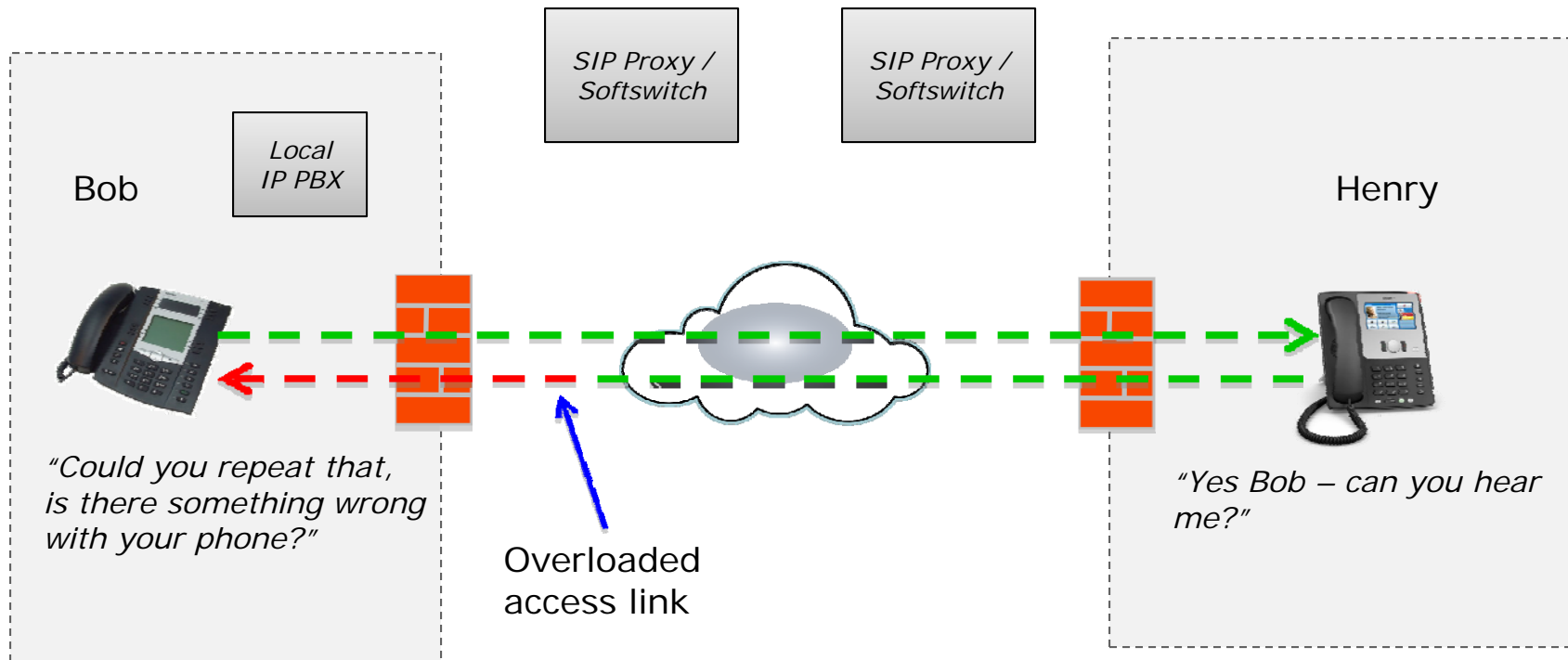
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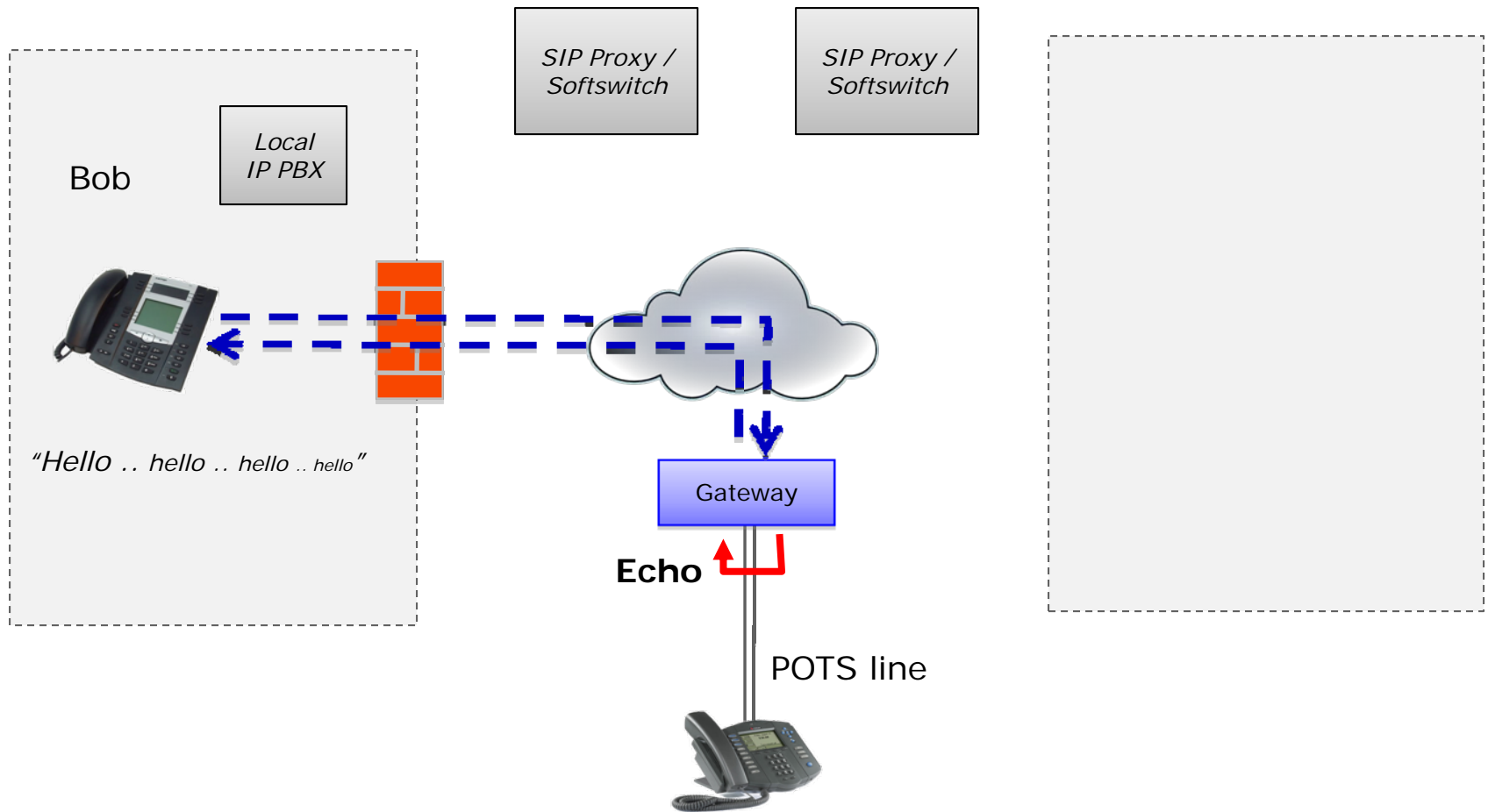
Bad ^ day in the life of a VoIP Call



Bad A ^ day in the life of a VoIP Call

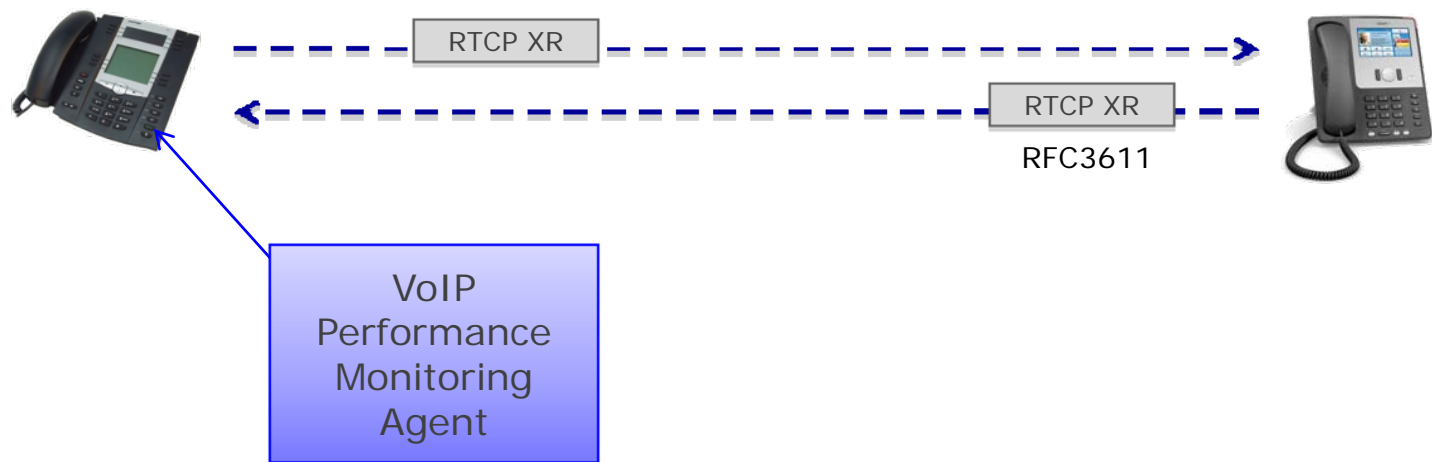


Bad ^ day in the life of a VoIP Call

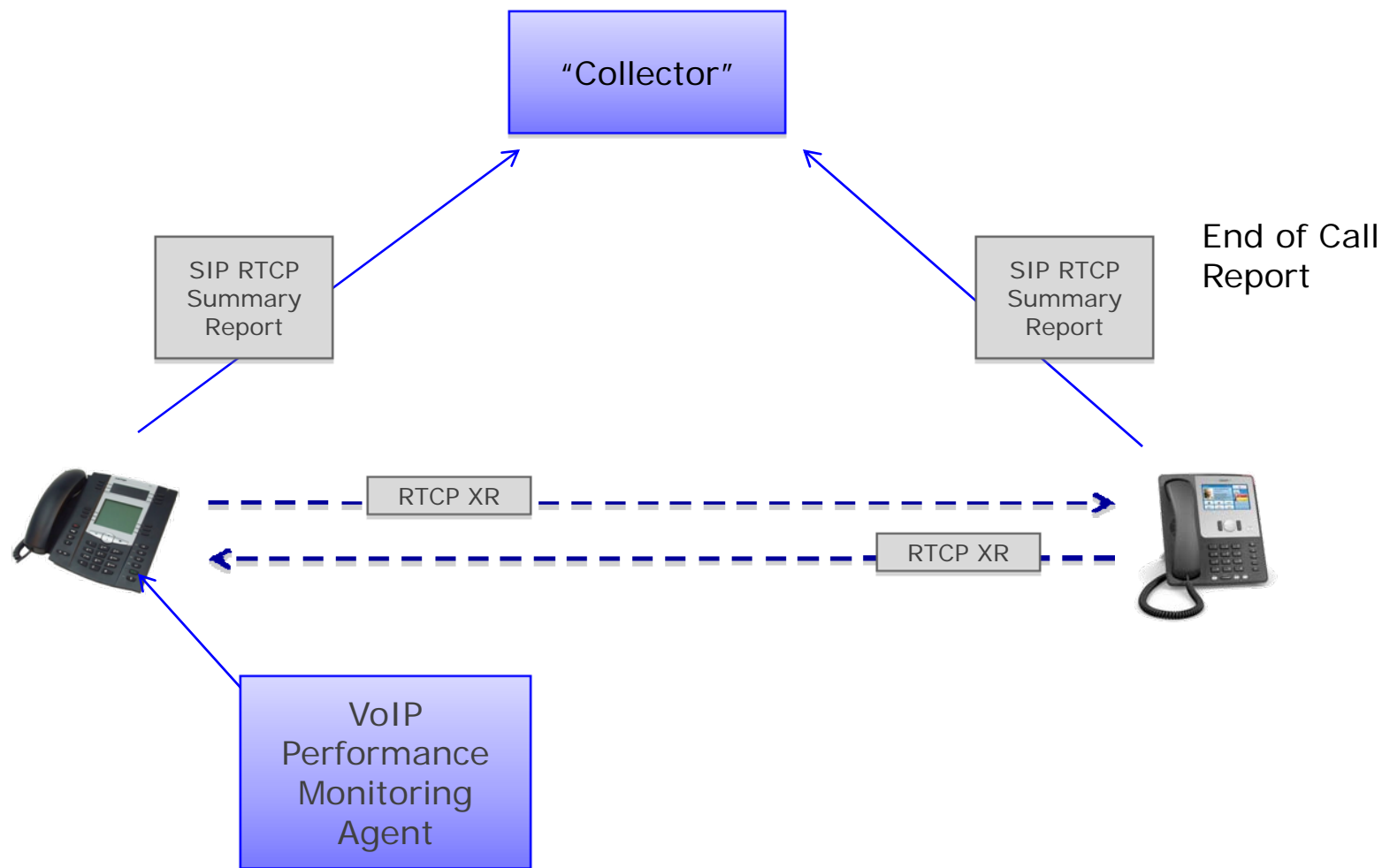


Performance Management – Intelligent Phones

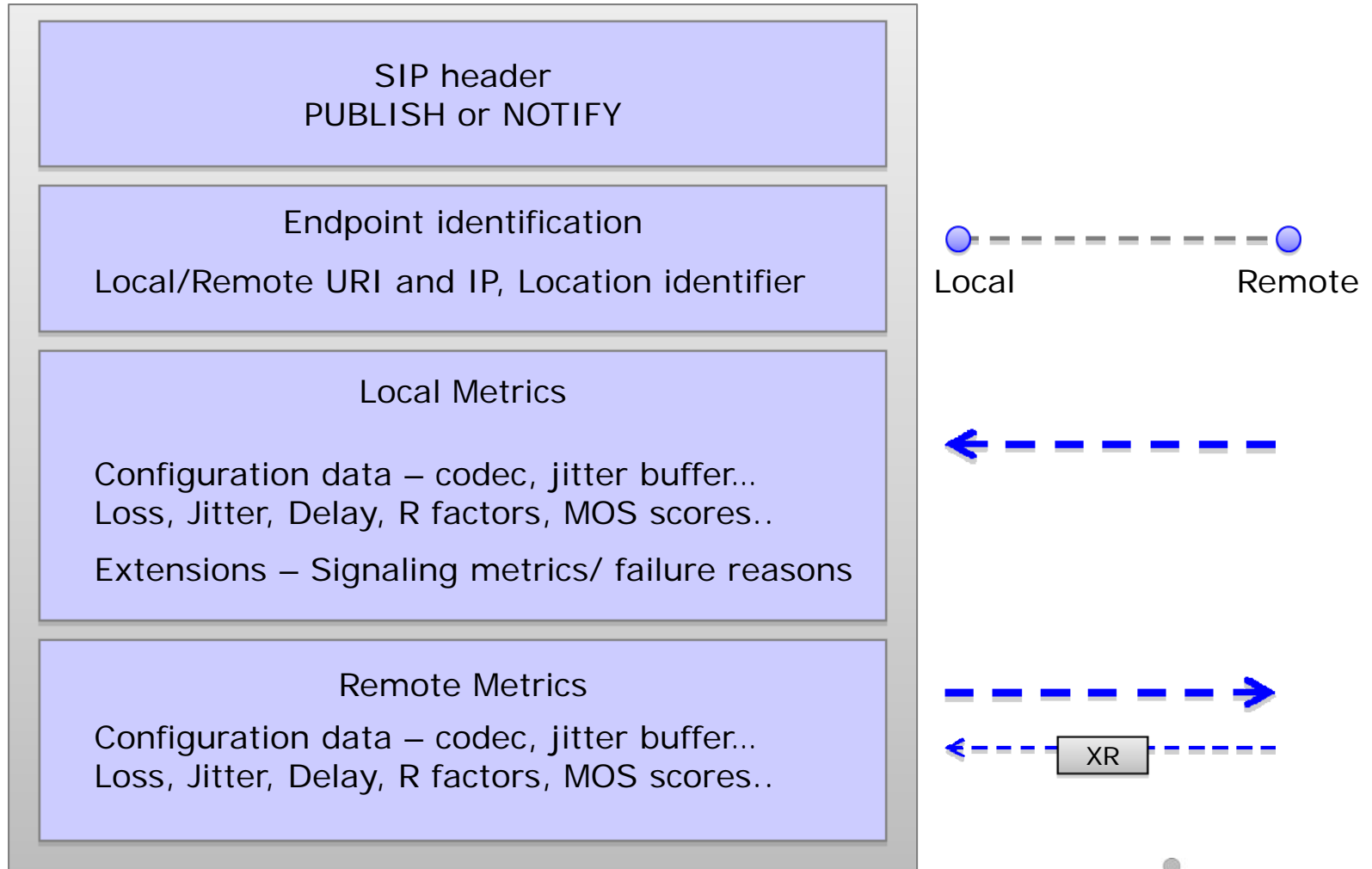
Supported by Adtran, Avaya (Nortel SIP phones), Cisco (SPA family), Polycom, Snom..



Performance Management – Intelligent Phones



RFC6035 – SIP RTCP Summary Report



RFC6035 - Options

- Session Report – End of Call
 - **Recommend** you use this
- Interval Report – used for intervals during call
 - Recommend one of
 - Don't use
 - Use with interval of 15 minutes, to provide more visibility for long calls
 - Use only for problem diagnosis
- Alert Report – when problem occurs
 - Don't recommend you use this
 - Knowing about good calls helps to diagnose bad calls
 - Calls may be "on the edge"
 - Requires configuration of IP phone thresholds

RFC6035 – Key Metrics

- MOS Scores – 1-5 range
 - Holistic quality score – codec, loss, jitter, signal, noise.....
 - MOS-LQ – Listening Quality
 - MOS-CQ – Conversational Quality (includes echo and delay)
- R Factors – 0-95 narrowband codec, 0-120 wideband codec
 - R-LQ – Listening Quality
 - R-CQ – Conversational Quality (includes echo and delay)
- Packet Loss Metrics
 - Loss rate – proportion of lost packets
 - Discard rate – proportion of late packets discarded by jitter buffer
 - indicates congestion
 - Burst length and density – periods of high loss/discard that would be noticeable to the user
 - Gap length and density – gaps between bursts – “good” periods

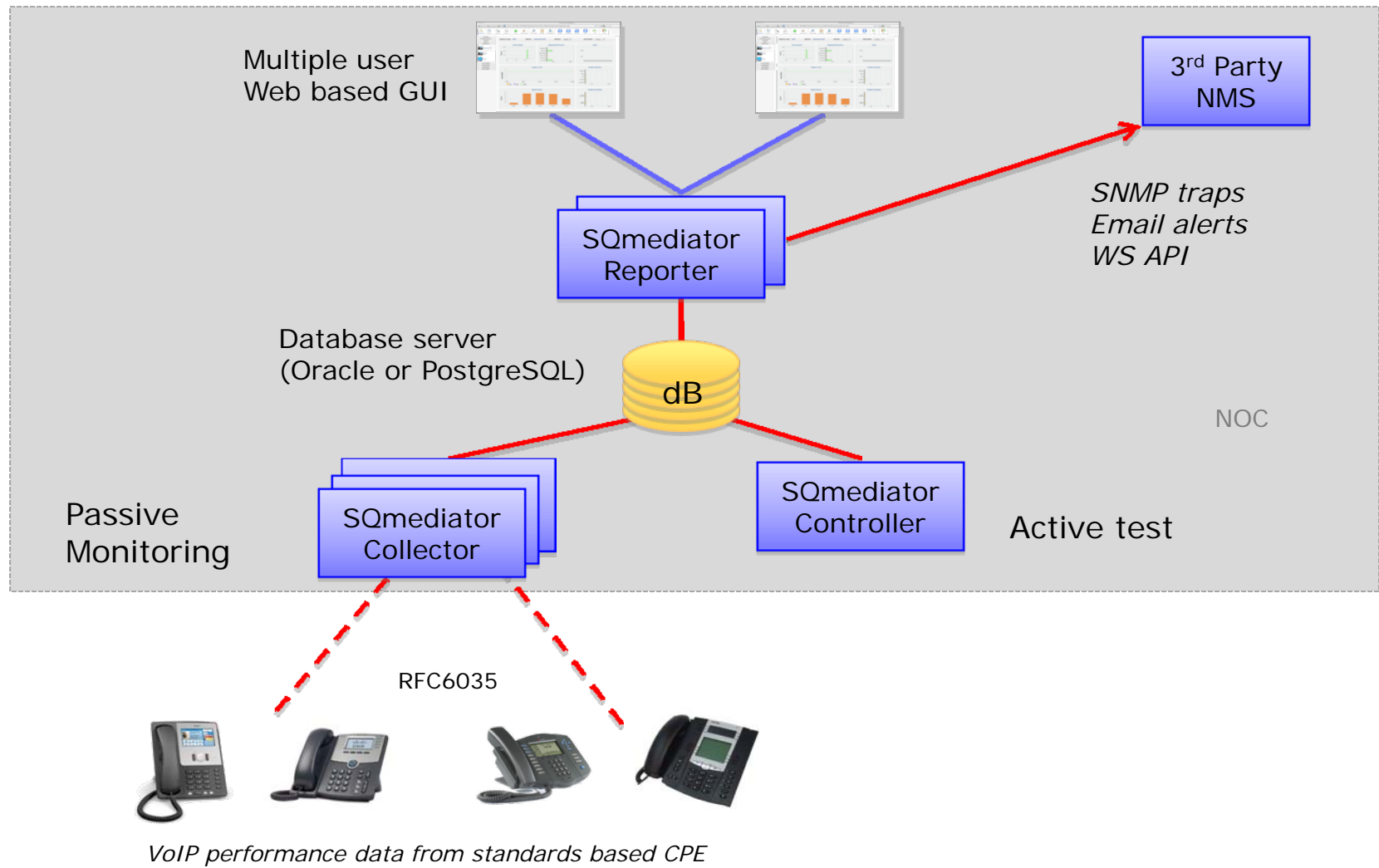
RFC6035 – Key Metrics

- Jitter Metrics
 - Packet delay variation – indicates congestion
- Delay Metrics
 - Network delay and End System delay (internal to IP phone)
- Signal/Noise/Echo Metrics
 - Signal level, Noise level, Echo Return Loss
- Extended – signaling metrics
 - Registration delay, failures
 - Call Setup delay, failures
 - Call Termination delay, reasons

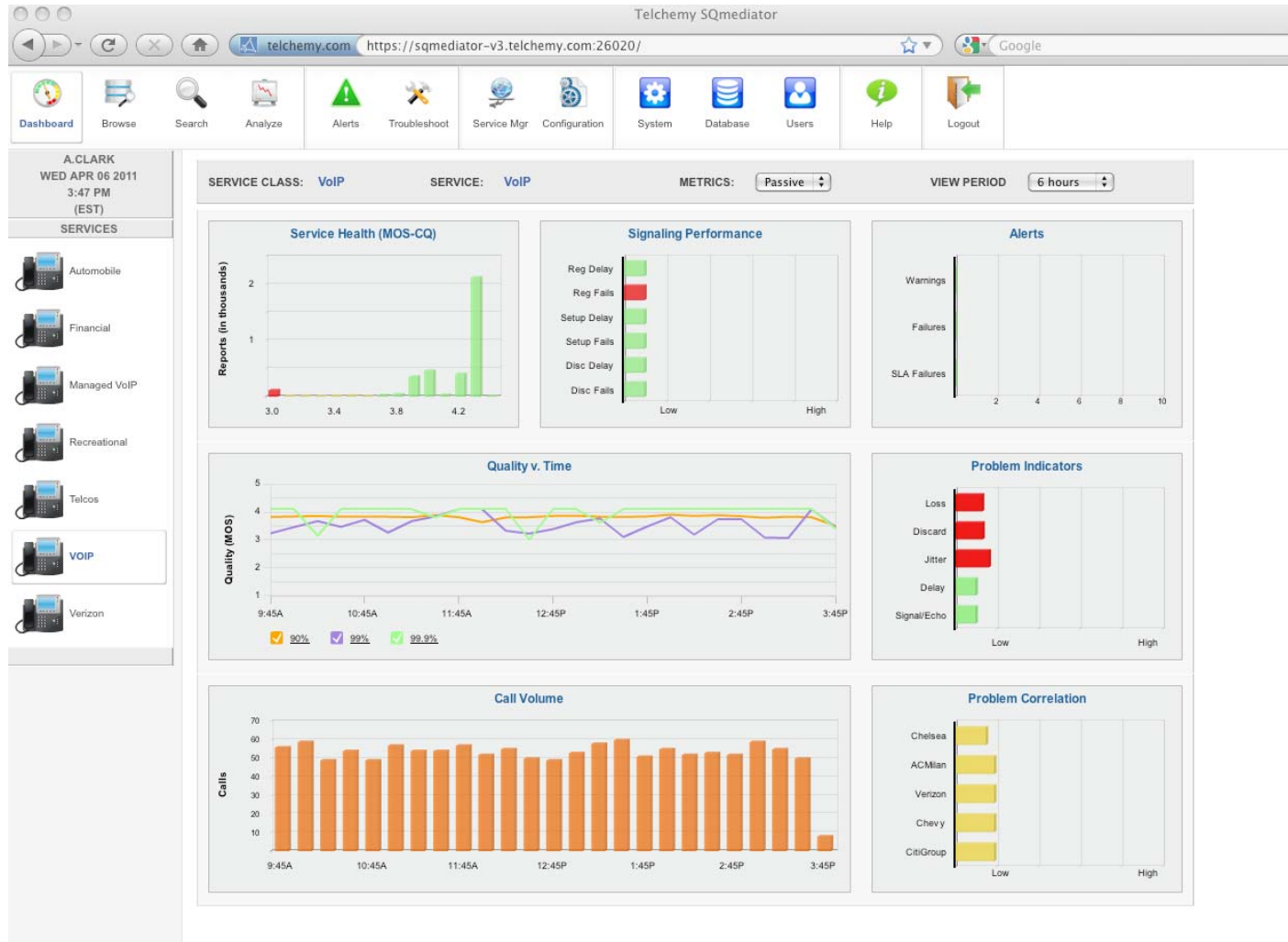
How is RFC6035 used - IP Centrex, Hosted PBX

- Gives Service Provider a call quality report for every call made
- Allows call quality data to be correlated with user extension/phone number and location
- Allows service provider to distinguish local LAN calls from site-site calls
- Service provider can use data to
 - Proactively detect and troubleshoot problems, either by location/site or by individual user/subscriber
 - Provide SLA reports
 - Provide customer with access to per-location dashboards of performance
- Highly cost effective and scalable approach

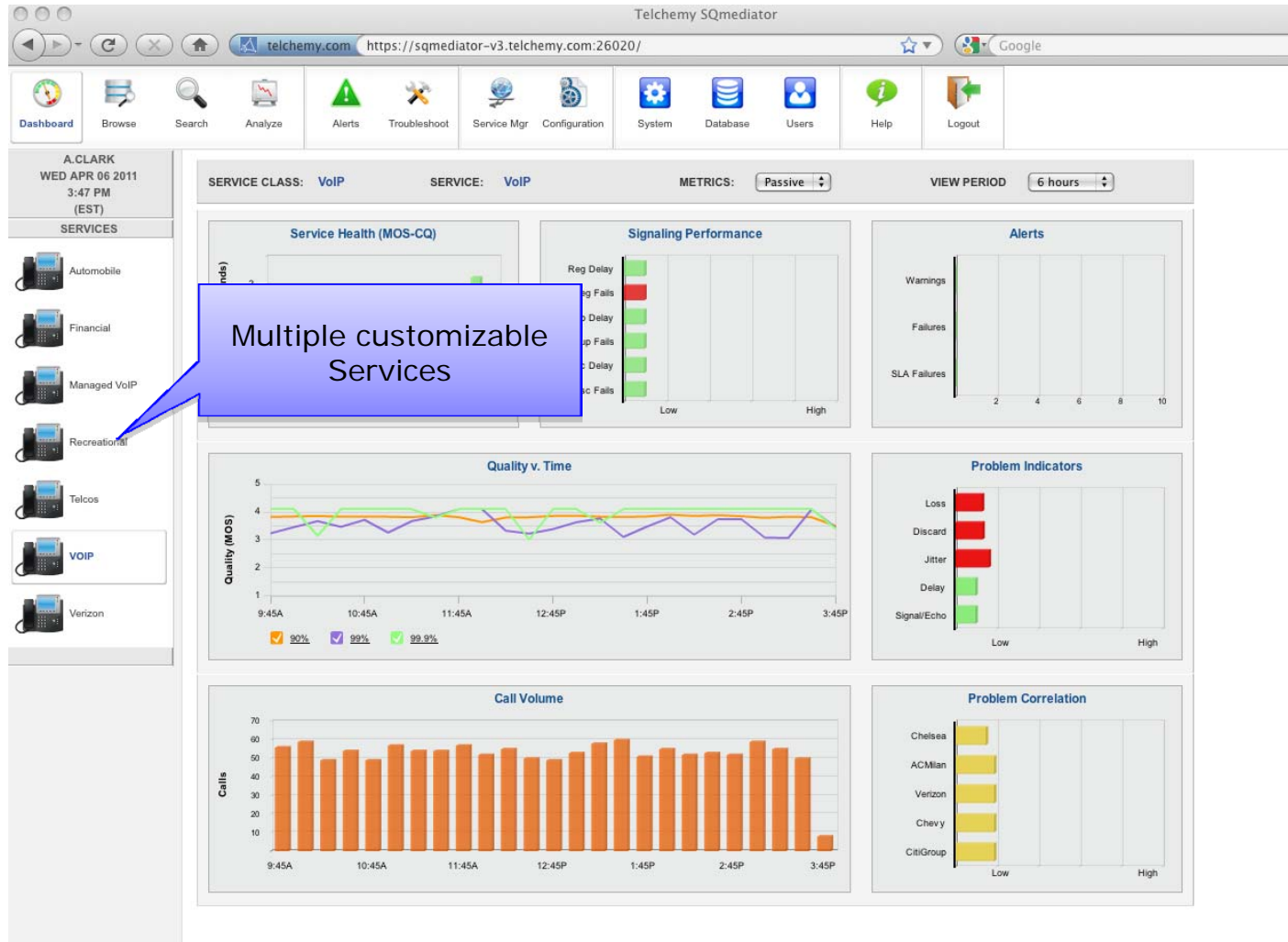
Example VoIP Performance Management System



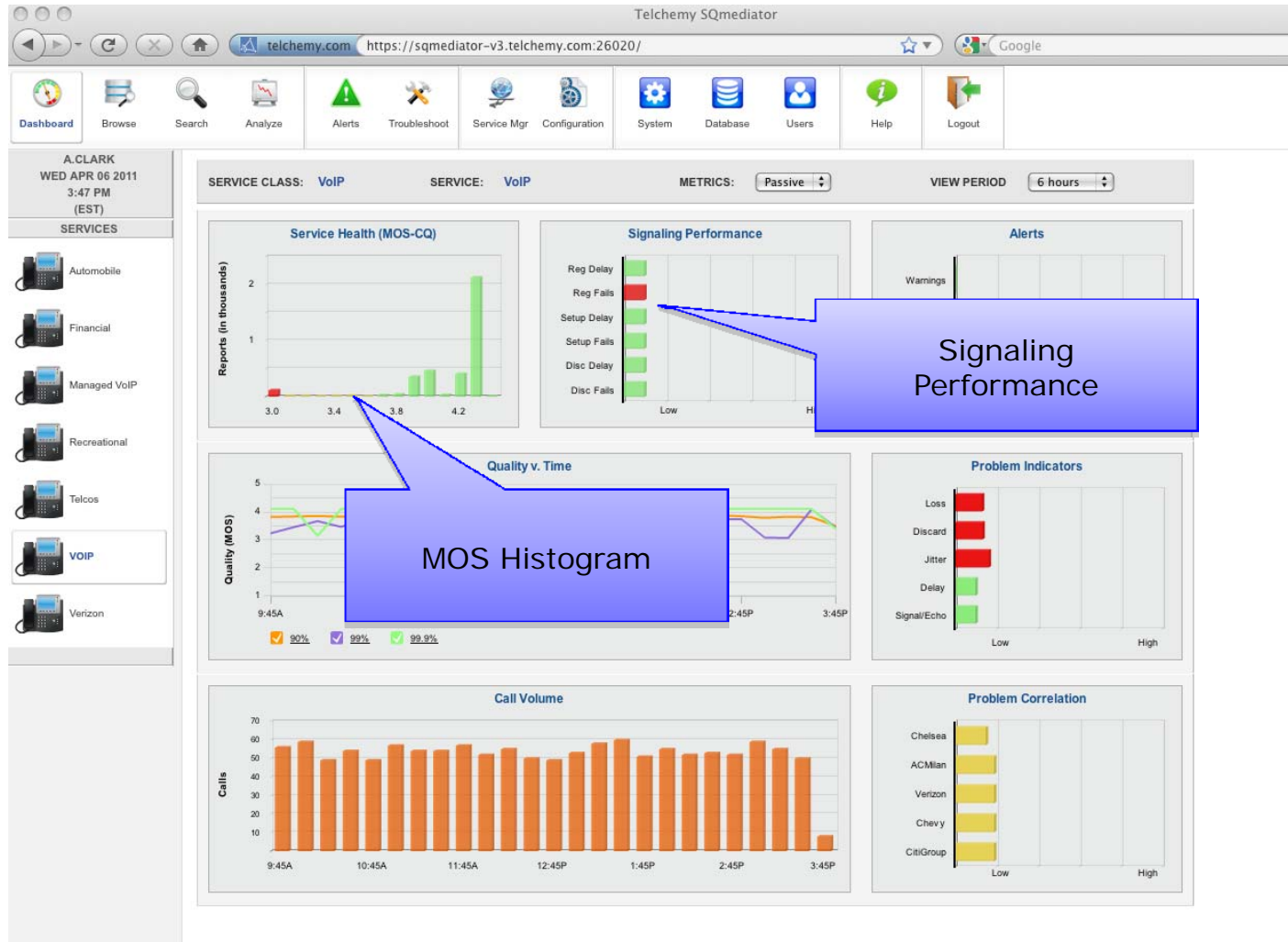
VoIP Performance Management System



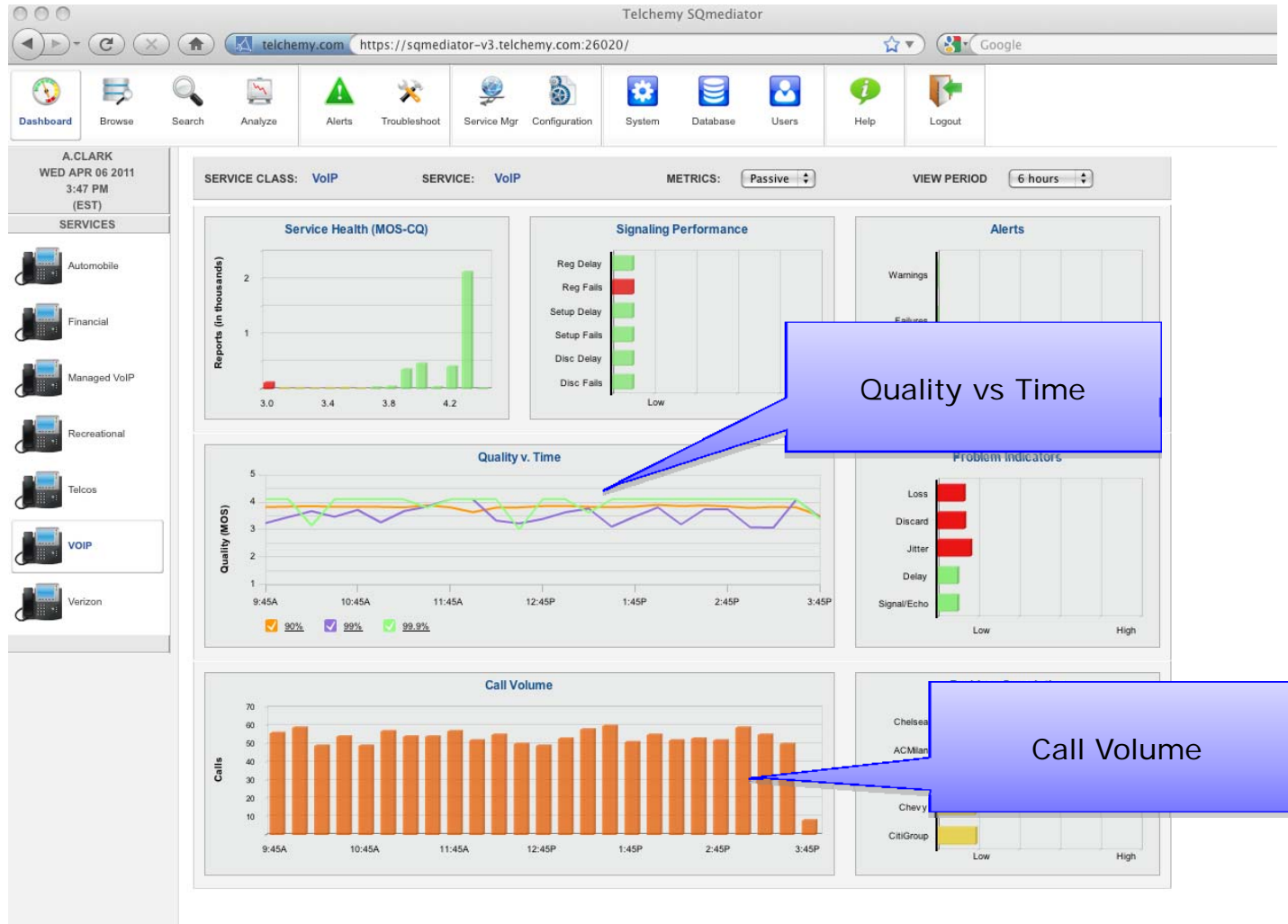
VoIP Performance Management System



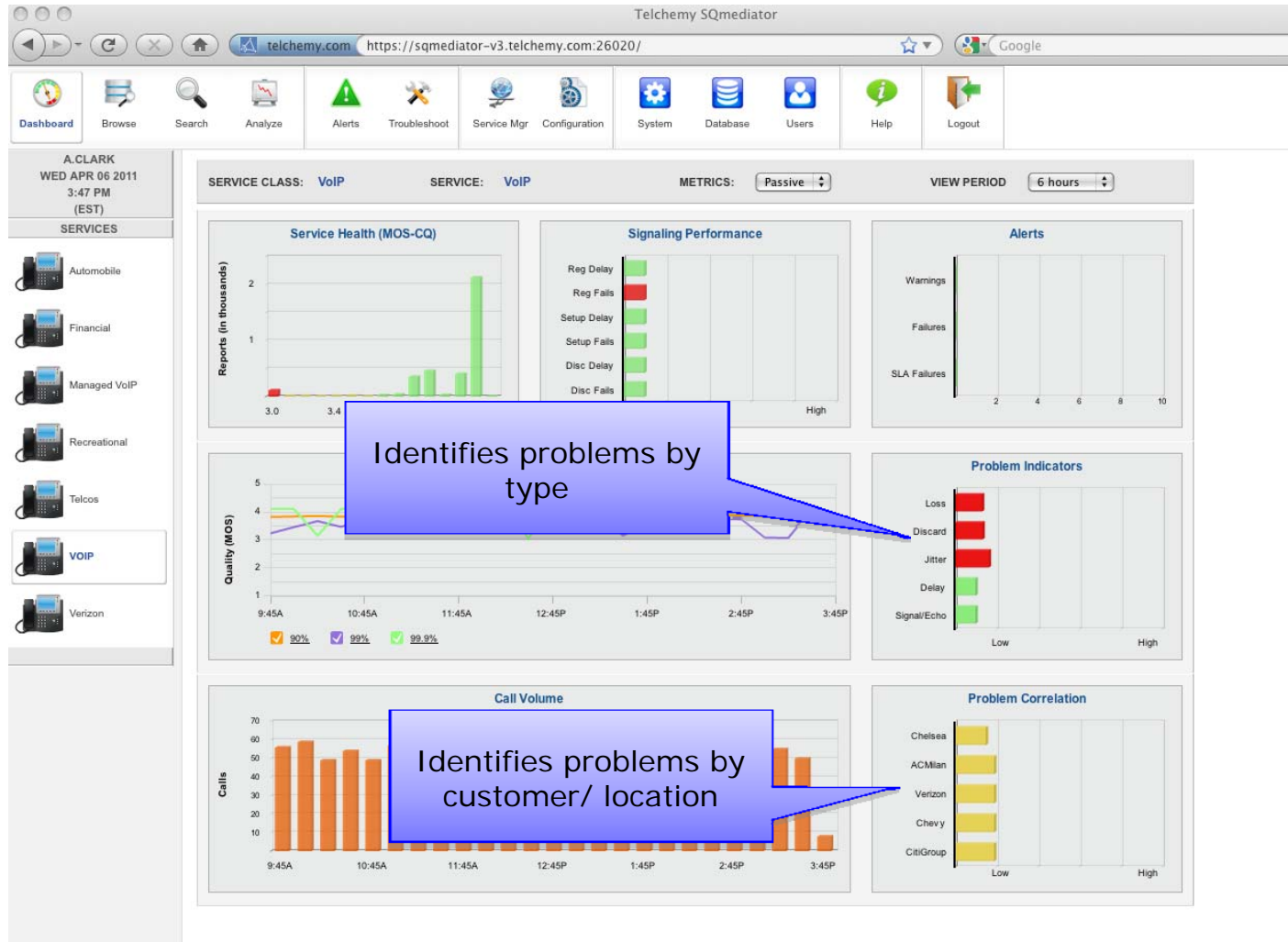
VoIP Performance Management System



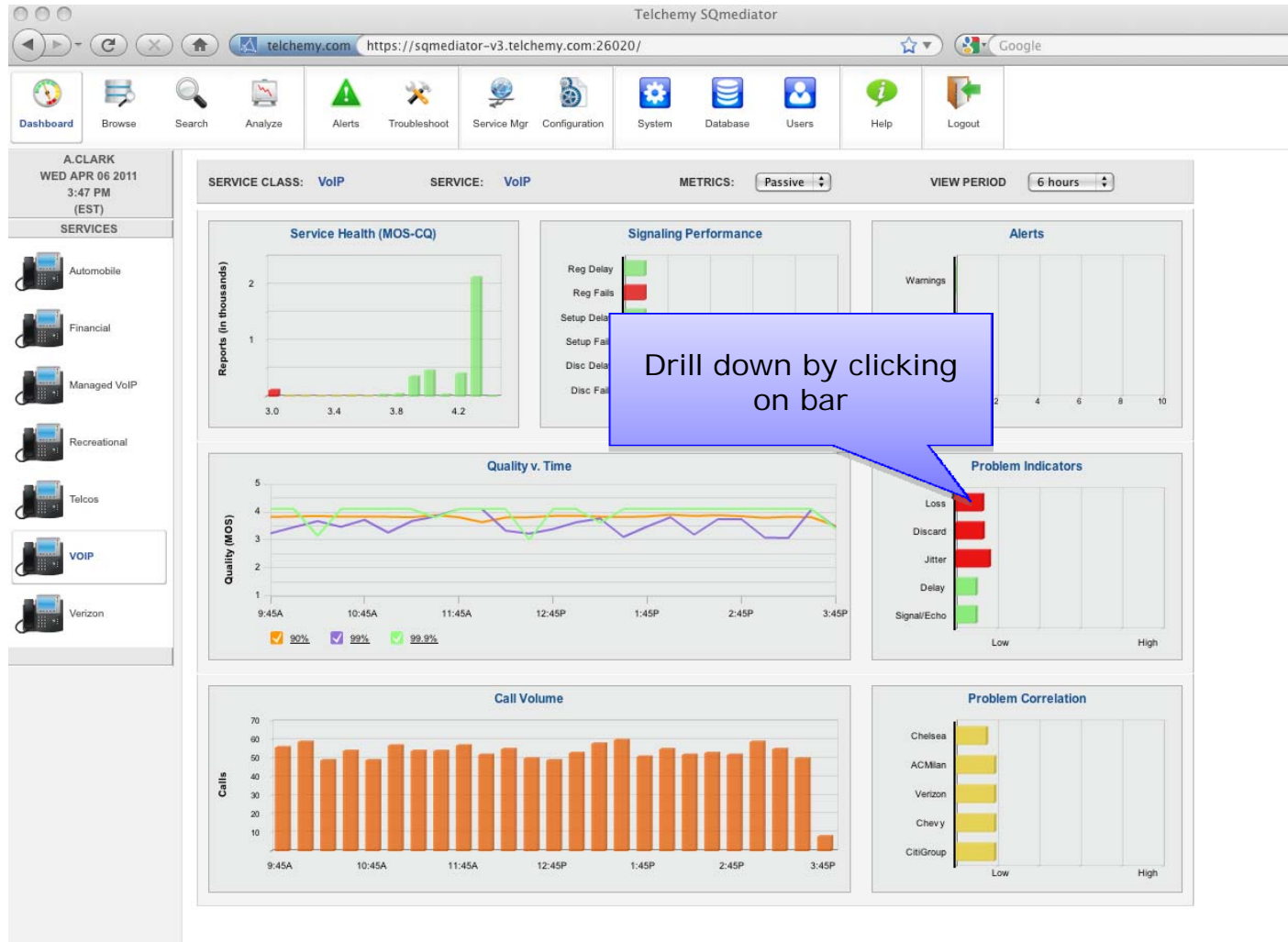
VoIP Performance Management System



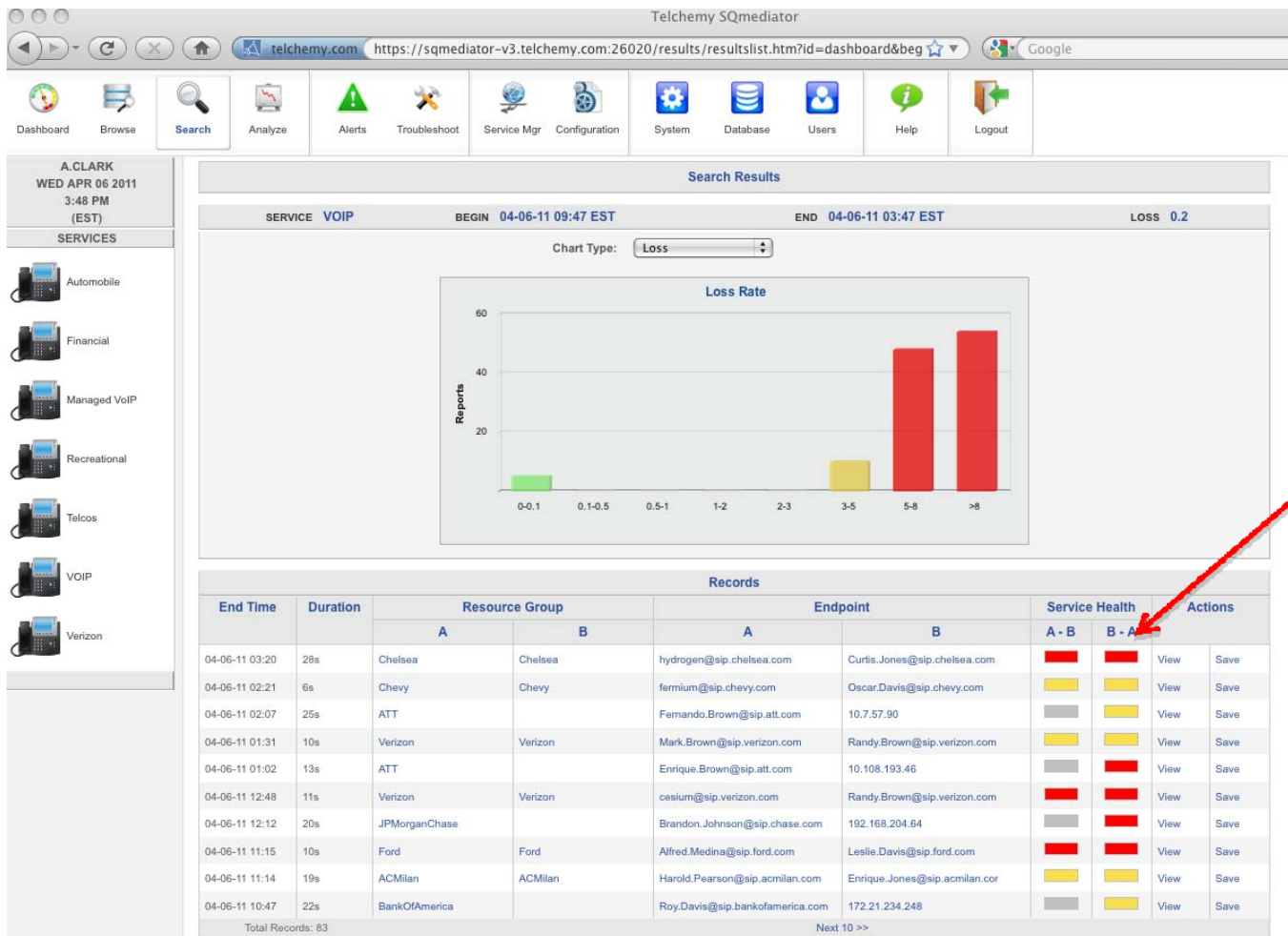
VoIP Performance Management System



VoIP Performance Management System



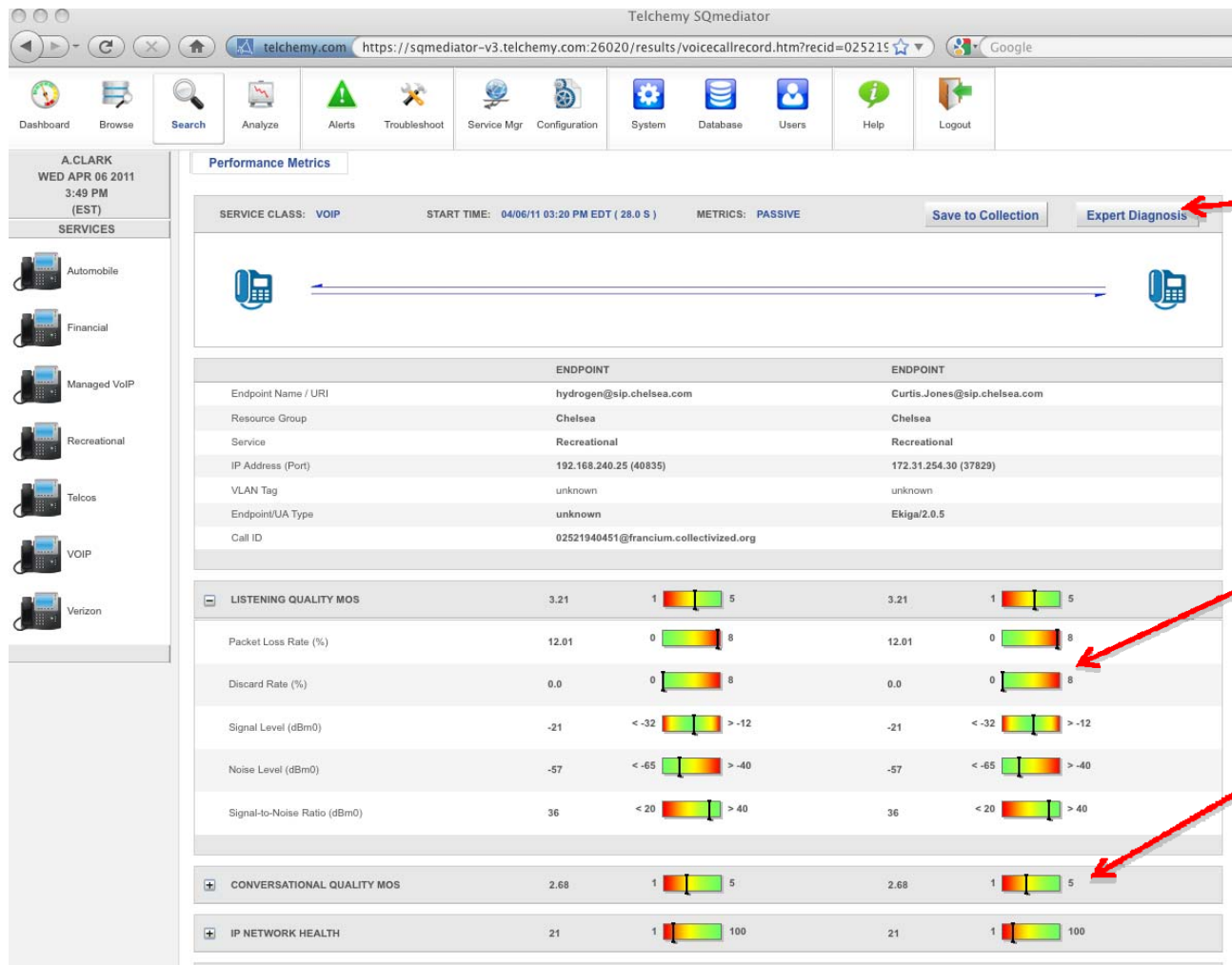
Problem Detection & Drilldown



List of calls or tests with this problem

Click on any record to see details of call or test

Problem Detection & Drilldown



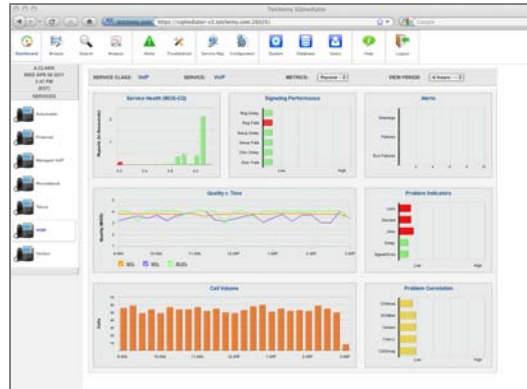
Expert diagnosis button

Detailed report with all metrics

Self explanatory metrics, easy to understand

MOS scores and R factors for Voice and Video tests

Service provider vs Customer dashboard



Service Provider

Full access

Customer

Dashboard for own data

Customer

Full access to own data

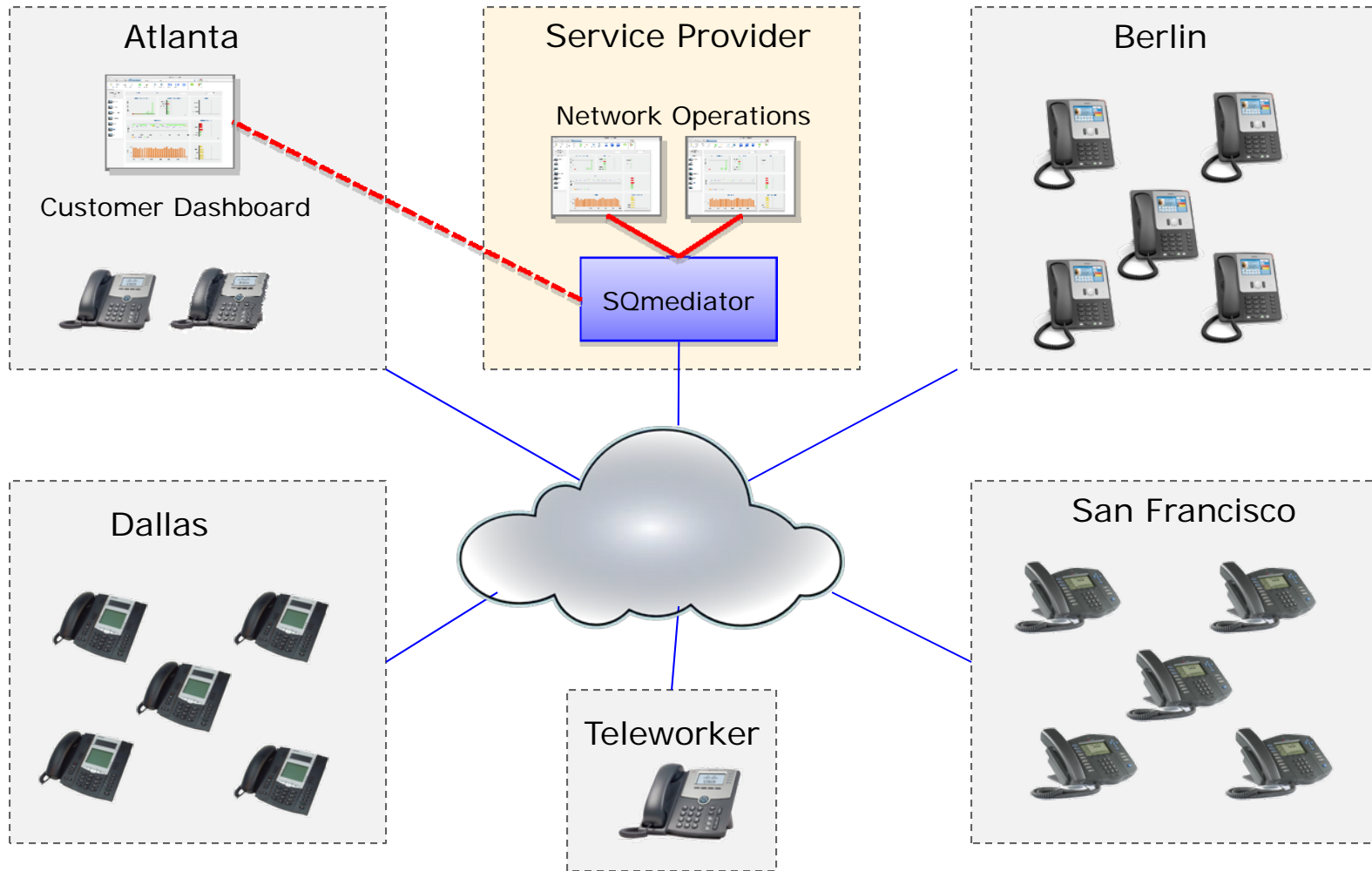
Access can be restricted if needed

Access restricted to customer's own data

Fault/Performance Management vs SLAs

- Fault management
 - Requires alert immediately a problem is detected
 - Alert goes into Service Provider fault management system
- Performance Management
 - Ability to analyze trends, proactively manage quality
- Service Level Agreement
 - Ensures performance criteria met over some agreed timescale

Example Deployment



Summary

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