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June 25, 2012

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

RE: Ex Parte Notice: CG Docket Nos. 10-51 and 03-123

Dear Ms. Dortch:

Lydia Runnels, Ian Blenke, George Lee and the undersigned of CSDVRS, LLC (“ZVRS”) met on June 21, 2012 with Henning Schulzrinne, Chief Technology Officer, and Richard Hovey, Wireline Competition Bureau to discuss the interoperability portion of the Commission’s pending VRS Further Notice of Proposed Rulemaking (“FNPRM”). We also discussed the interaction of interoperability standards with 911 services.

Per the Commission staff’s request, we provide below a list of critical compatibility issues in video technology which pertains to VRS users:

- I. CODEC incompatibilities
 - a. H.264: RCDO not supported by many devices;
 - b. H.264: baseline has numerous extensions that cause incompatibilities (Facetime/iChat are a prime example);
 - c. H.264 single NLU vs multiple-NLU causes problems;
 - d. H.264 FMO (Flexible Macroblock Ordering) a mixed bag for interoperability;
 - e. H264 feature variant such as profiles, frame size, bandwidth enhancing features;
 - f. H.263+/H.263++ numerous incompatibilities;
 - g. H.263 deblocking filter;
 - h. H263. RFC 2190 should be the common baseline;
 - i. H.245 "offering" vs SIP SDP "expecting"; and
 - j. de-blocking filters caused problems with InPerson devices for a while.

- II. Encapsulation incompatibilities (case-in-point: RFC2190 and nTouch PC)
 - a. H.323: nTouch PC falls back to "Microsoft" encapsulation for H.263 if RFC2190 isn't offered by the other side;
 - b. H.323 H.245 "offers" codecs and streams for the other side to accept;
 - c. SIP SDP publishes "requirements" for the other side to fulfill, the opposite of H.323;
 - d. SIP: Many SIP vendors require specific dynamic payload numbers for streams;
 - e. SIP: Less than 32 available "dynamic" payload numbers available between 96 and 128;
 - f. SIP: If more than 32, "dynamic" payloads "wrap" and vendors have issues; and
 - g. SIP's mostly ignored mechanism for port-multiplexing is non-backward-compatible encapsulation.

- III. Packet fragmentation issues
 - a. SIP RFC3261 requires TCP fallback when UDP payload over an unknown path-mtu link would be more than 1300 bytes;
 - b. Numerous vendors have ignored RFC3261 and have implemented only UDP for SIP;
 - c. Fragmentation on large size SIP packets over UDP; and
 - d. VPN tunnels often cause fragmentation of large video packets, causing packet loss.

- IV. Keyframe negotiation issues
 - a. H.323 Miscellaneous message for Picture-fast-update; and
 - b. SIP "INFO" method message for Picture-fast-update vs RTCP negotiation.

- V. Bandwidth negotiation issues - SIP "INFO" bandwidth negotiation vs RTCP negotiation.

- VI. Signaling issues
 - a. H.323 - generally backwards compatible;
 - b. "fast-start" (including H.245 capset in the initial SETUP) caused various problems;
 - c. most implementations now use slow-start with H.225 tunneling, some use H.245 tunnelling;
 - d. numerous ways for call forwarding (FACILITY message, etc);
 - e. Sorenson's proprietary H.323 H.221 "SINFO" handshaking for calling Party information;
 - f. Sorenson VP200 doesn't support DTMF;
 - g. URI vs dialed Digit calling (Cisco/Tandberg reject dialed Digit calls, require URI dialing); and
 - h. SIP - this is a very long list which will take some time to compile.

- VII. Encryption issues
- a. SIP has at many different methods incompatible of encrypting: TLS, SRTP, DTLS, ZRTP, over ICE or not, etc.;
 - b. H.323 H.235.6 generally interops between different vendor gear the best;
 - c. Need to establish a common ground for both signaling and media; and
 - d. There appear to be vague implementation specific issues with both symmetric-key and asymmetric-key generation (namely: knowing when a given vendor's implementation considers the generated key "strong enough" to trust for call negotiation).
- VIII. Network Address Translation (NAT) often impede interoperability
- a. H.323 H.460.18/19/23/24 with Multiplexing solve most of our NAT traversal issues;
 - b. SIP ICE/STUN/TURN are problematic between vendor gear;
 - c. Full-cone NAT (one-to-one NAT) configurable on devices cause just as many problems as they solve; and
 - d. Symmetric NAT tends to kill RTP streams outright.
- IX. Application Layer Gateways (ALGs) try to help by rewriting signaling and/or proxying media.

Commission staff also asked us to share any suggestions about activities which would support the transitioning to an interoperable environment. In ZVRS' comments in response to the Commission's December 15, 2011 FNPRM,¹ ZVRS recommended that third party test labs and certification system be established to have hardware, software and gateways tested and certified as interoperable. This would allow for the complete transition to interoperable "off-the-shelf" technology along with VRS Access technology standards within a defined timeline, which we recommended as two years. We also commented that the Neustar interoperability event was a positive first step and we look forward to continuing with that work.

Sincerely,

/s/

Jeff Rosen
General Counsel

cc: Henning Schulzrinne
Richard Hovey

¹ *Structure and Practices of the Video Relay Service Program; Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Comments of CSDVRS, LLC., pgs 37 et seq., CG Docket Nos. 10-51 and 03-123 (March 9, 2012).