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International Good Practices in Promoting ICT Accessibility

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Relay: An Industry in Transition

- Drivers:
 - Migration from PSTN to Internet
 - Implementation for some countries has already occurred but will accelerate globally from 2018
 - Open standards, particularly ITU-T F.703 ratified in 2000 to support ‘total communications’
 - Advances in wireline and wireless broadband accessibility, processing power and memory density coupled with mass market devices enables feature rich, easy to use audio, video and RTT services

Why choose international standards?

- Systems with good longevity need a solid basis in open standards, be modular in hardware, and most importantly, software
- F.703 sets out the next generation of relay services using the ‘total communications’ concept of audio, video and real time text that the user chooses in any combination according to their personal preferences
- SIP addressing in email type format provides for international connectivity in the same way that the international PSTN does for hearing people

Examples of where standards apply

- Signalling to set up and tear down calls. SIP (RFC 3261) has taken over from H.323
- Video codecs:
 - H.263 to support backwards compatibility with some older videophones
 - H.264 to support High Definition
 - VP8 and VP9 to support WebRTC
- Audio codecs
 - G.722 (wideband audio)
 - Opus (RFC 6716)

Video quality

- There is no one size fits all so any platform must be able to transcode at minimum 30 frames per second between e.g.
 - HD (720p) the minimum to be classed as High Definition
 - CIF (Common Interchange Format) commonly used in video teleconferencing systems. First proposed in H.261
 - QCIF = Quarter CIF (176* 144)
 - VGA (640*480)

Transmission protocols

- Universal Data Protocol (UDP) and Transmission Control Protocol (TCP) are in common use
- Whenever medical information is being discussed there is likely to be a requirement that the communications be encrypted
- Even for general traffic users express a preference for the privacy of encryption. The Secure Real Time Transport Protocol (SRTP) RFC 3711 is one method of encrypting media content
- Transport Layer Security (TLS) for secure call control is in service. Where it is used, automatic reversion to unencrypted call control is required if the second endpoint does not support TLS

Open Systems

- Necessary to break down the barriers created by 'island solutions' designed primarily for the hearing population including FaceTime, Skype, Google Hangouts and other proprietary solutions
- Look back on the financial consequences of early adopters accepting pre-standards ratified technology from typically Japanese and American vendors anxious to be first to market and to gain market share. Europeans tend to take a longer term view in such situations and wait for standardised solutions

Open Systems

- Allows e.g. Deaf – Deaf calling directly using SIP addressing between VRS providers and internationally
- Allows existing SIP videophones to be used in Direct Service environments wherein Deaf can call e.g. Social Security Administration, IRS and utilities directly and be served by Deaf customer service agents in ASL obviating the need to place VRS calls. In large countries like the USA this can save large amounts of VRS funding but it is not possible to implement with a closed 10 digit numbering system and associated ENUM database to translate between PSTN numbers and IP addresses

Open Systems

- Enable call-backs from enterprises that use IVR systems and that offer a call-back option without losing one's place in a queue
- With a SIP address that has a national telephone number as the prefix e.g. (044993341@consultel.nz) call-back is possible and a VRS agent can be coupled in automatically. Such a service is operating in Norway since December 2014. It is efficient and saves interpreter resources being wasted waiting in queues. Without SIP, the user needs two PSTN numbers to allow the call to be routed correctly.
- The length of the address is irrelevant as we all store contact details in our devices and dial by name these days

Is open-source software suitable for real-time applications?

- The initial attraction from a policy perspective is the possibility of multiple contributors enhancing a solution
- But how are the contributions quality controlled?
- Are there lessons to be learned from the rigour of getting apps onto the Apple Appstore compared to the Android Play Store?
- Has anyone ever heard of an open-source SPC public telephone exchange platform for local, tandem, transit, international and mobile telephone applications?
- Relay is a real time service that demands the same modular hardware and software structures and strict quality control as any other high availability public telecommunications system

Why non open-source?

- High availability (In 2015 Norway's platform was unavailable for 12 minutes. This is an availability of 99.99997%)
- Stability. Extensive development testing ensures new software additions do not muck up existing features.
- An extensive range of features is available from vendors that base their developments on feedback from user focus groups – Deaf, deafblind, HoH, speech impaired, elderly
- Low maintenance requirement (Norway required 6 technicians to maintain its previous cobbled together solution compared to 1 somewhat bored technician for its purpose-built F.703 cloud-based platform)

Real Time Text

- Character by character transmission
- Interruption possible in a way not possible with TTY
- Standardised in ITU-T.140/RFC 4103
- Strongly promoted by AT&T in the USA as the successor to TTY
- Now the subject of a NPRM by the US FCC
- In service in Norway and Sweden
- Multi-party RTT conferencing now available

End-user devices

- For next generation relay services end-users will use mass market devices including:
 - Windows PC
 - iMAC
 - iPAD and Android tablets
 - iOS and Android smartphones
- The mass market devices will be supplemented by Bluetooth connected Braille pads, external keyboards and alerting devices

Greetings and Mail

- F.703 based systems provide functional equivalence for automatic greeting and mail in the case of unanswered calls
- Users can leave an audio/video greeting that invites the calling party to leave a message
- The calling party can leave a message in audio, video or RTT as they choose.

Fraud Prevention

- From 1 July 2016 New Zealand will allow incoming international IP calls to its Video Interpreting Service (VRS/VRI) so that Deaf can use it while travelling overseas. This is self governing because if the caller does not use NZ Sign Language they cannot use the service
- New Zealand allows its relay provider to terminate calls that are obviously fraudulent

Equipment Distribution Programs

- There will be a shift from a hardware focus to include purpose designed total communications software to run on mass market devices
- It is expected that if a person is issued a paid licence for a tablet or PC that they get a free licence for their smartphone with the same SIP address assigned to both devices. In the case of Deaf, the smartphone set to vibrate serves as their call alerting device.

Hand-up broadband grants

- In Norway and beginning in Sweden there is a progressive policy of funding mobile broadband for 1 year so that a communications disabled person can seek employment and prove that with modern communications support they can be fully integrated to all aspects of company life. After 1 year either the employer or the employee pays for the broadband