W3C Speaker Identification and Verification Workshop

Speaker Verification in a Multi-Vendor Environment

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What is Centrelink?

⇨ **Equivalent to the US Department of Social Security**

  ➢ Centrelink is an agency within the Australian Department of Human Services

  ➢ Mission is:

    • Serving Australia by assisting people to become self-sufficient and supporting those in need.

⇨ **Service provider to over 20 government departments**

  ➢ Including FaHCSIA, DVA, DEEWR, DAFF, DHA

⇨ **Services 6.5 million customers**

  ➢ Includes delivery of a range of payments to Australians, including people with disabilities, retirees, families, carers, parents, Indigenous people and people from diverse cultural and linguistic backgrounds. Also includes crisis referral and disaster response.

⇨ **Has the largest call centre in the southern hemisphere**

  ➢ More than 32 million phone calls per year

⇨ **Has web self services based around portals**

  ➢ More than 18 million on-line transactions per year.

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Overview of Centrelink's Speaker Verification system

⇨ Identity and authentication is central to Centrelink's services

⇨ Multi-algorithm solution
- ➢ Provided by two vendors, using an integration component (VACM)
- ➢ Built for semi-complex 2-factor authentication (to Australian Government Authentication Framework standards)

⇨ SV Currently sits in an IVR environment
- ➢ Proprietary Intervoice IVR
- ➢ Nuance's (Speechworks vintage) Natural Language Speech Recognition
  - • plans to upgrade
- ➢ Nuance Text to Speech
- ➢ Web Services based

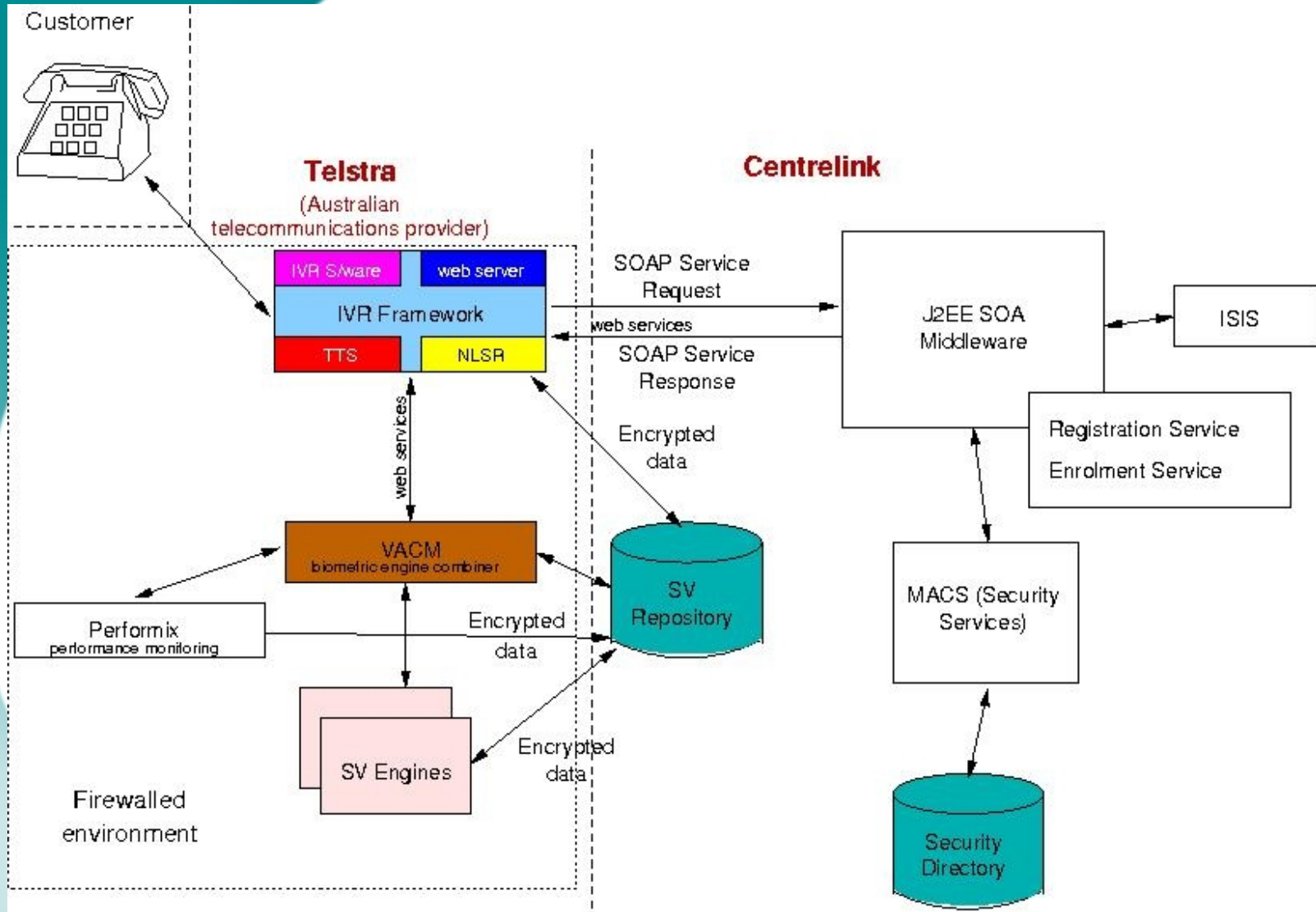Centrelink
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Centrelink's deployment

⇨ Conducted a proof of concept, followed by a pilot, followed by a production deployment
  - ➢ Stage-gate based approach to careful consideration of using this biometric based security service
    - Conducted over a period of nearly 5 years (from concept)
    - Included community and privacy group consultation
    - Each stage successful
  - ➢ Built as an initiative of data security (Run from S&IP branch)

⇨ Currently being rolled out to high volume telephone callers

⇨ Considering offering it to enable employment declaration processing
  - ➢ initially over the telephone
  - ➢ possibly over the web in the future
    - Other multi-factor credentials are also being considered
    - It would be part of a mix of credentials available

Centrelink's future intentions

⇨ Propose to incorporate SV wholly into the security services

- ➢ Speaker verification is seen as a security credential used for confirming an identity, rather than being a component of a user interface.
- ➢ Becomes part of a security solution suite to assure identity
  - providing authentication services to the IVR
  - and providing authentication services to web
- ➢ still operating as a web service (as per our security services)
- ➢ Considering using its text independent features in the future

Centrelink's current system

Centrelink future directions
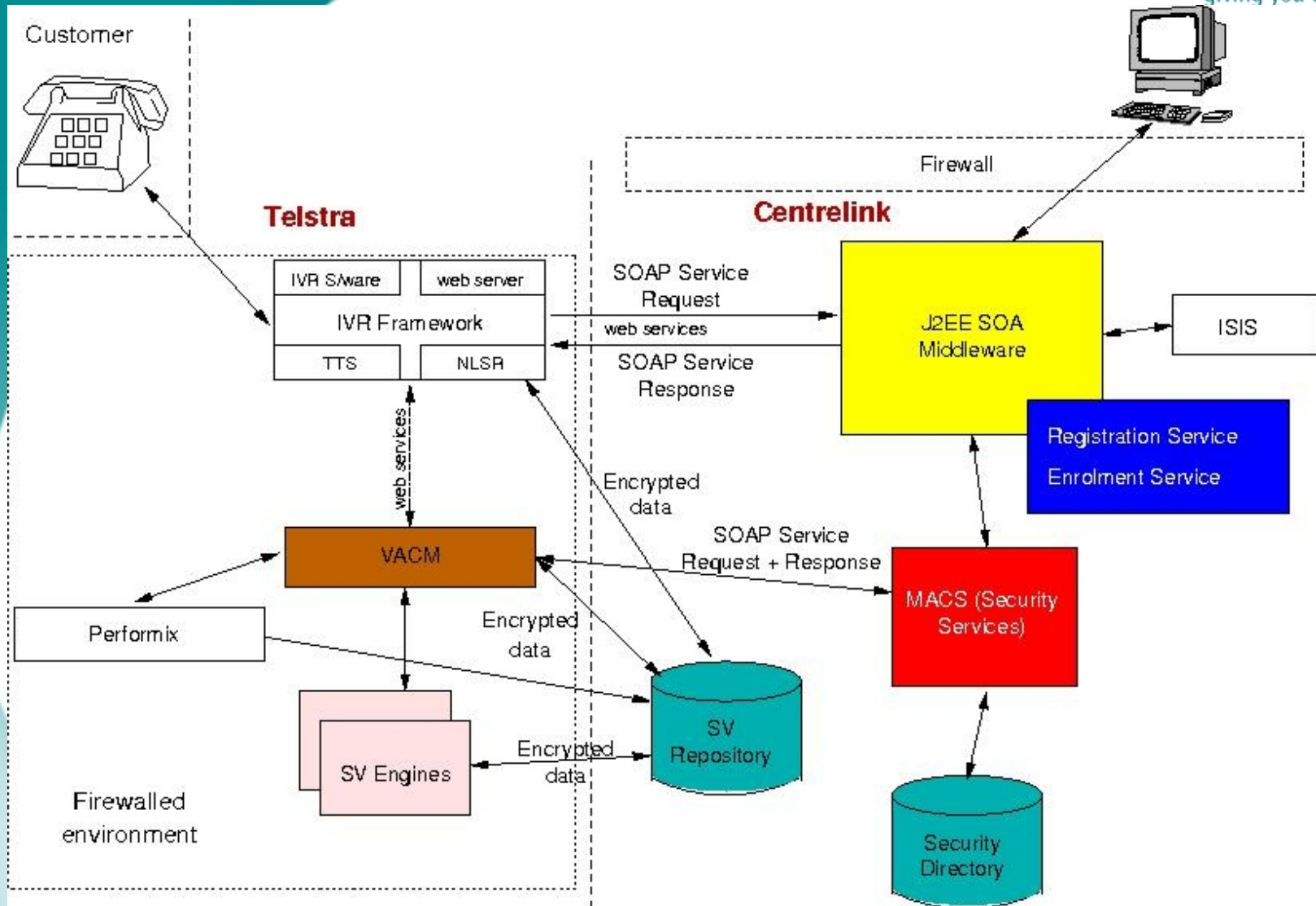
Data Content

⇨ For the biometric only (step 1) authentication:

➢ Initialisation

- Provides:
  – customer access number (CAN) (from IVR)
- Receives:
  – registration profile (identifier as known by SV and details around the enrolment)

➢ Authentication:

- Provides:
  – calculated result and scores from each engine for the combination of CAN, name and random digit measurements
    » scores logged for audit and legal purposes
- Receives:
  – Question set to ask and rules around question processing

Data Content

⇨ For the secret question and answer (step 2) authentication:

- ➢ Initialisation
  - The already received question identifiers and rules
- ➢ Authentication:
  - Provides:
    - – calculated result and scores from each engine for the answer to the secret question measurements
  - Receives:
    - – calculated authentication status (i.a.w. AGAF process)

VoiceXML – How it can help us

⇨ Parallel processing and pipe-lining
  ➢ Current customer experience is gaps between requests for data and the associated provision and the next request
    • Speaker verification could be processing in the background while the next request and acquisition is made

⇨ Better support for streaming to both speech recognition as well as speaker recognition
  ➢ Some speech requires both recognition and speaker authentication
    • recognition is also a part of the authentication mix

Standards for Speaker Verification

⇨ For Centrelink (and the Australian Government in general), web services are important

  ➢ All our security services are web services based
  ➢ Our web pages are all portal based (Websphere)

⇨ ISO standards (CBEFF and BioAPI) are a good start

  ➢ but they are not web services based

⇨ Australian Biometrics Institute Privacy Code of Conduct

  ➢ Because privacy is a fundamental human right under the charter of 1948
  ➢ Voice samples and templates should be treated as personal information

⇨ Encryption is extremely important for biometrics

  ➢ It is very much about perception:

    • being *seen* to be doing everything possible to protect the credentials
    • Most important for opt-in (and opt-out) systems

  ➢ As voice data is indeed a very powerful biometric identifier, this data collection has very important implications for speech recognition systems
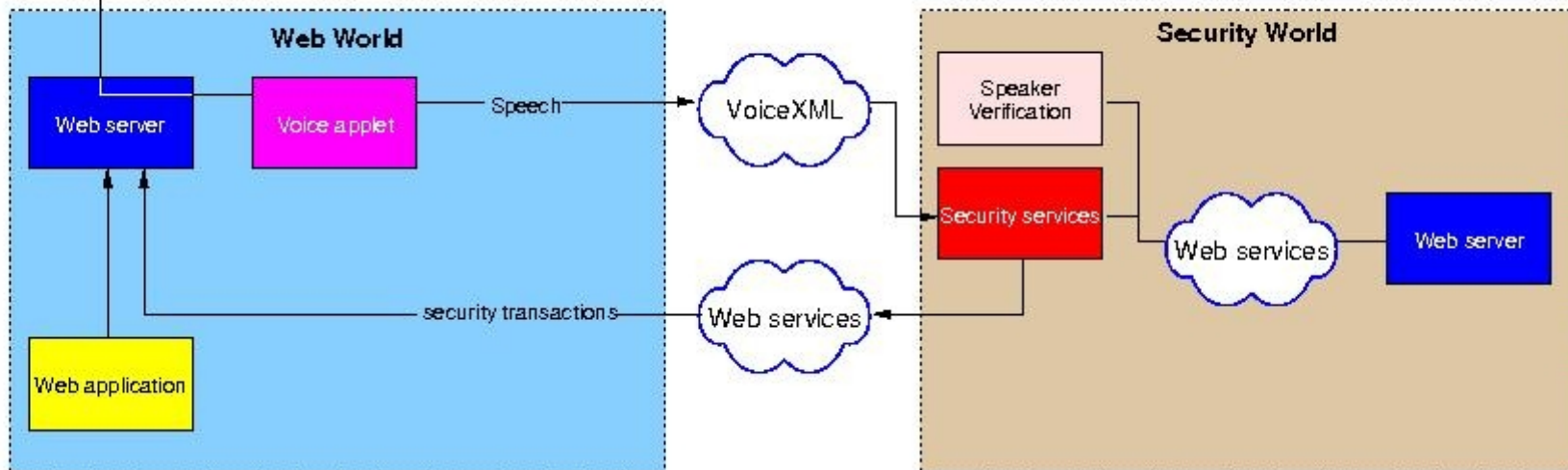
Standards for Speaker Verification

⇨ Support in VoiceXML is probably not important to us

➢ since we are moving to use it as a piece of the security infrastructure

- not the voice interface

➢ Centrelink approaches speaker verification from a security perspective rather than a user perspective

- therefore not seen to be part of the user interface layer

➢ the technology is not considered by Centrelink to be a component of speech recognition

- but a technology for enhancing security and identity authentication process

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A proposed arrangement: Pictorial outline
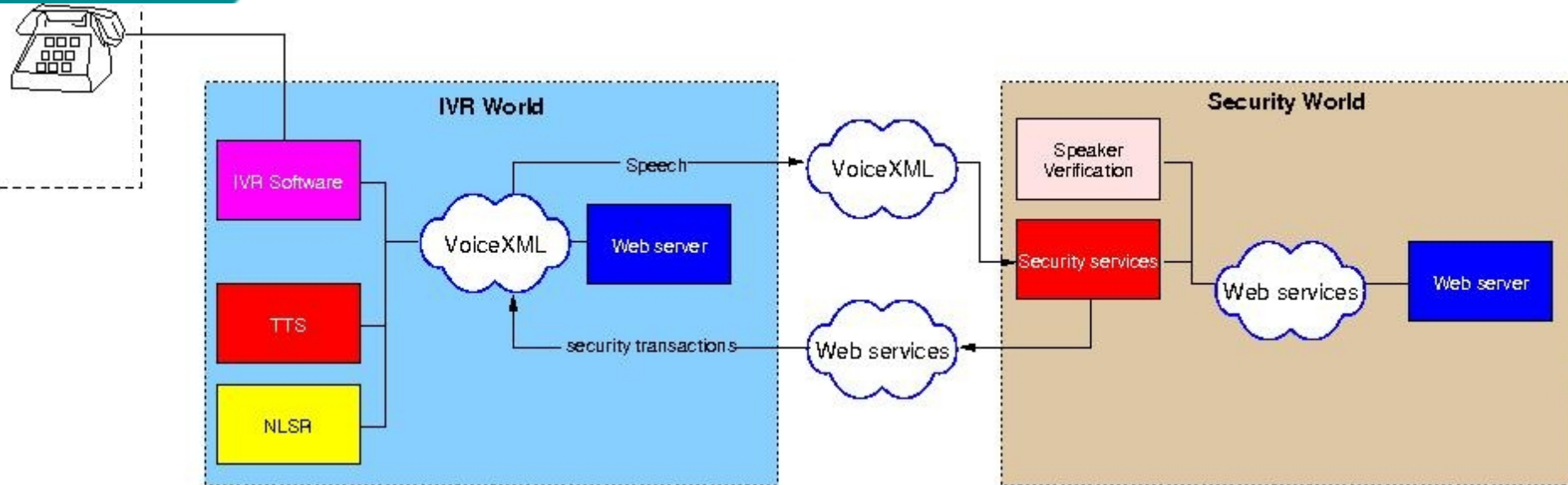
A proposed arrangement: Pictorial outline

Questions