Early Warnings 4 All worldwide (EW4All) Overview

Franklin Bell 2026-6-17

https://kynx.us for more. Consider this as a set of compatible tools for your situation. It is not a one size fits all approach.

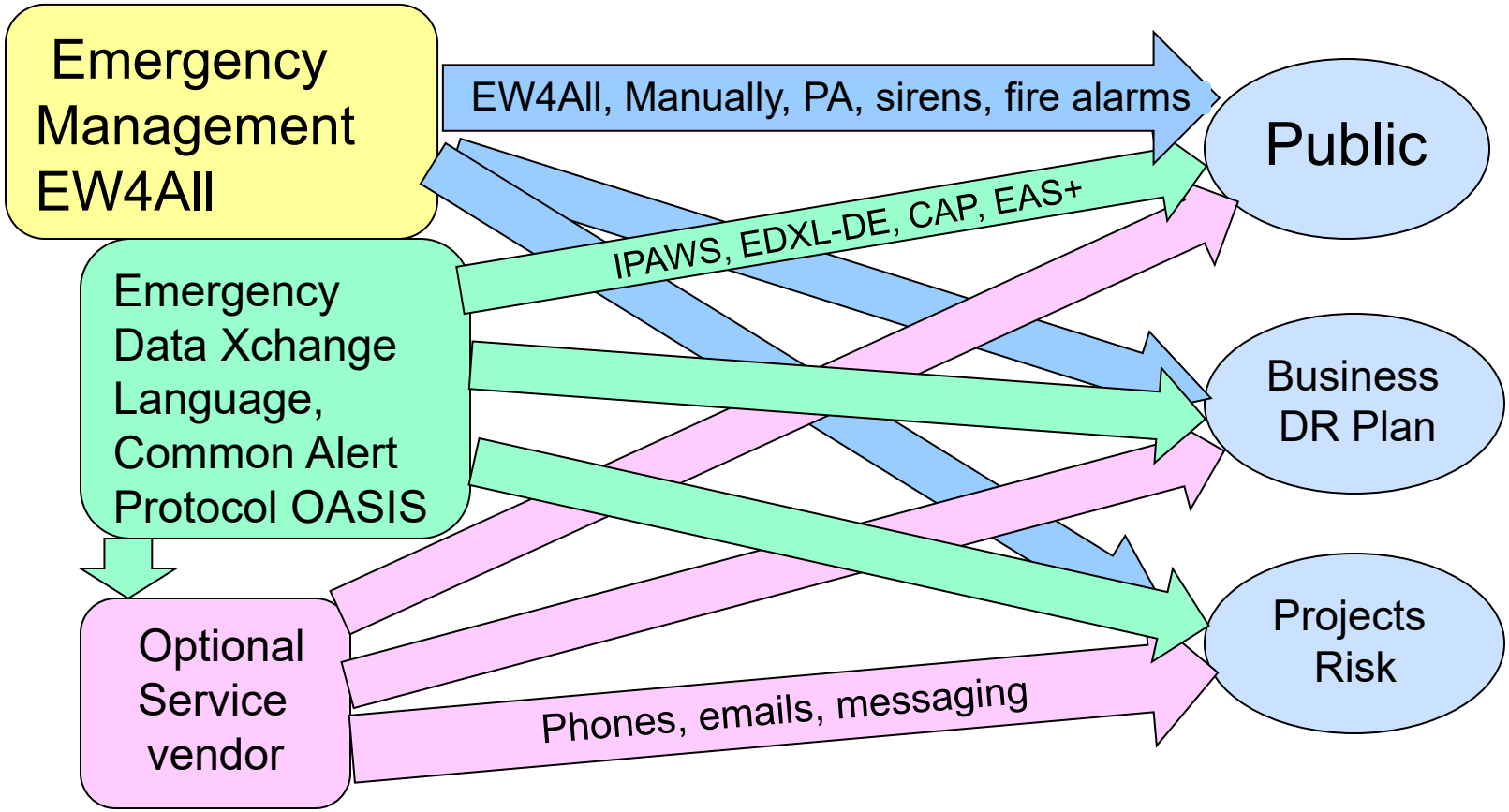
Earthquake Early Warning System is based on this technology for most rapid, selective alerts.

This is the Warning function. Data delivery of pictures, flood maps for vehicles, building plans for First Responders are a complementary app.

3 Learning Points

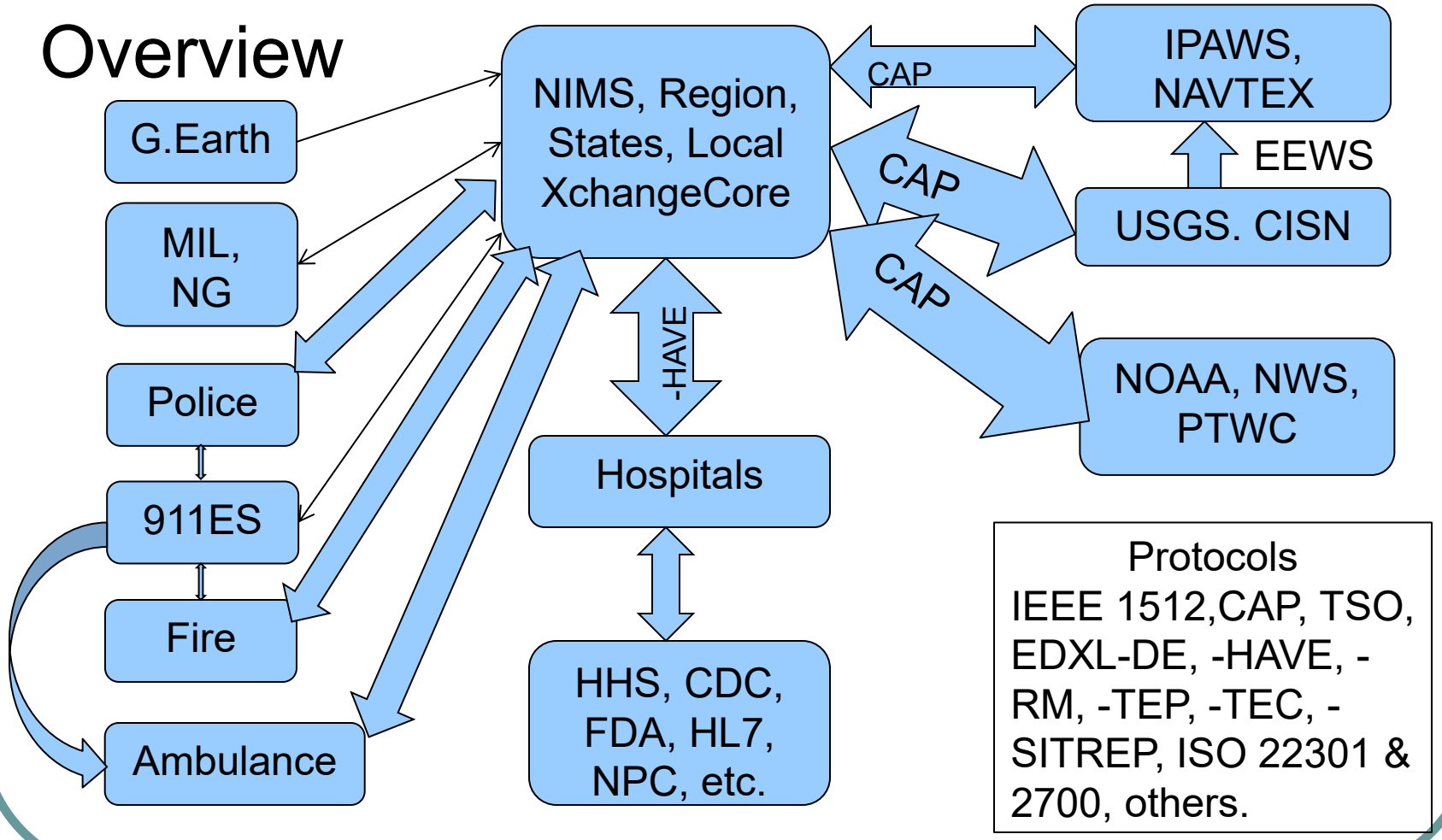
- EW4All is a mobile & broadcast alerting and file distribution system that saves lives, e.g. the Samoas, though the features are limited when only analog broadcasting is available.
- EW4All is a system of systems for emergency management using CAP and EDXL protocols. These protocols are developed by www.oasis-open.org.
- Severe non-human project risks are increasingly becoming manageable instead of invoking the “Acts of G_d” clause. Loss of life of project staff to disasters can be mitigated. Loss of time is also more manageable by allowing time for mitigation measures when appropriate. A response time of seconds is useful for tsunamis and for earthquake mitigation. Processing and transmission time is minimal.

EW4All outline, computer based



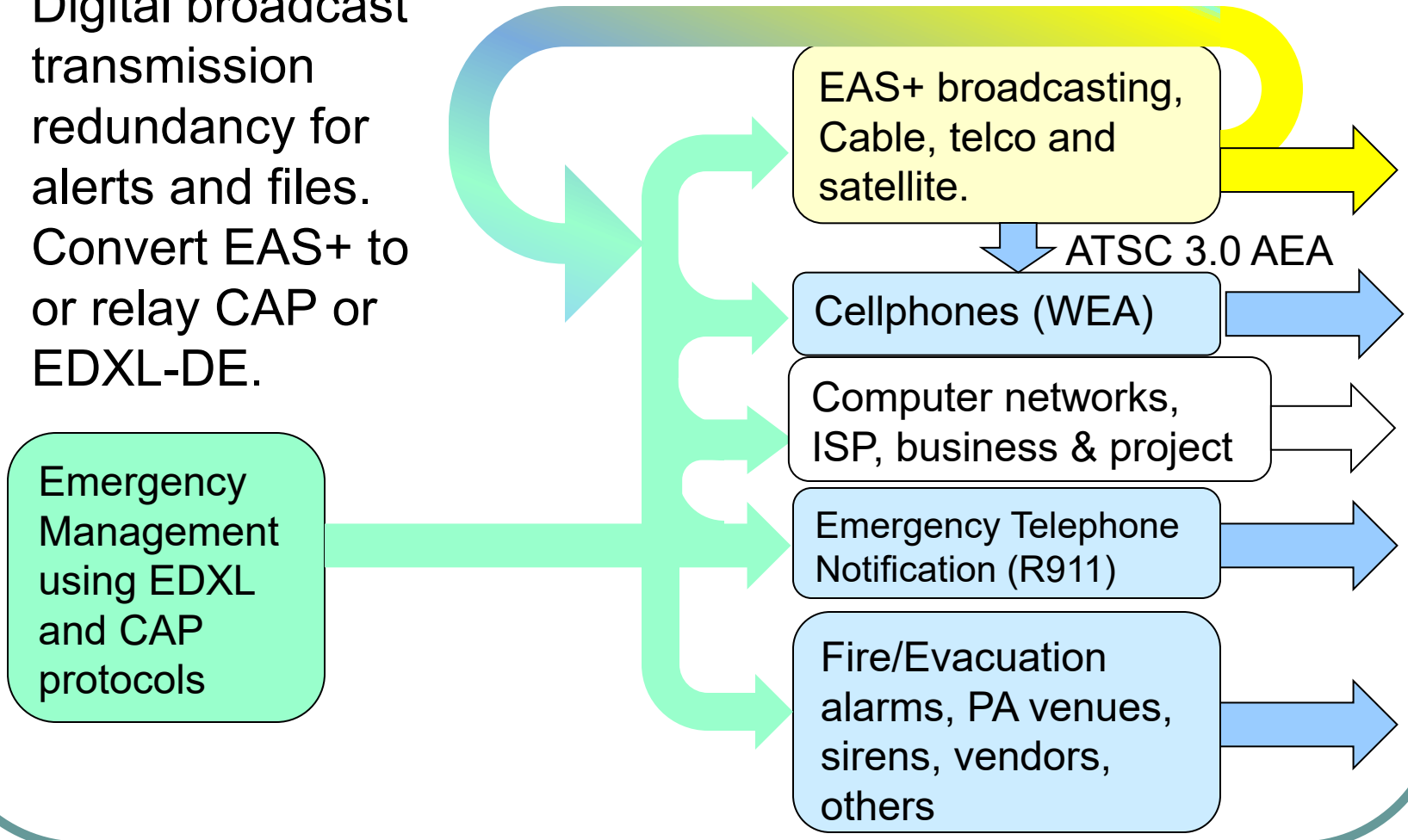
- With IT and other technologies

Why IPAWS? NIEM Compliance



IPAWS Introduction - 3

- Digital broadcast transmission redundancy for alerts and files. Convert EAS+ to or relay CAP or EDXL-DE.



Opinion 1, 4 points

- Considerable dissatisfaction expressed at FEMA/FCC summit for EAS 2008
- This Federal and large disaster system is little used by local EMOs because it is currently unsuitable and it cannot be incorporated into exercises
- Original encoder/decoders mostly over 10 years old and due for replacement
- Digital radio & digital TV offer possibilities

Opinion -2, 5 points

- Terrorists strike locally, but the current large area architecture is to the advantage of terrorists impact.
- Other languages (e.g. Spanish, French) have no provision for local implementation
- Better selectivity to avoid irrelevant messages
- Less effort by broadcast staff, perhaps EMO also with Message Templates
- Better integration into program playout automation system and hence workflow.

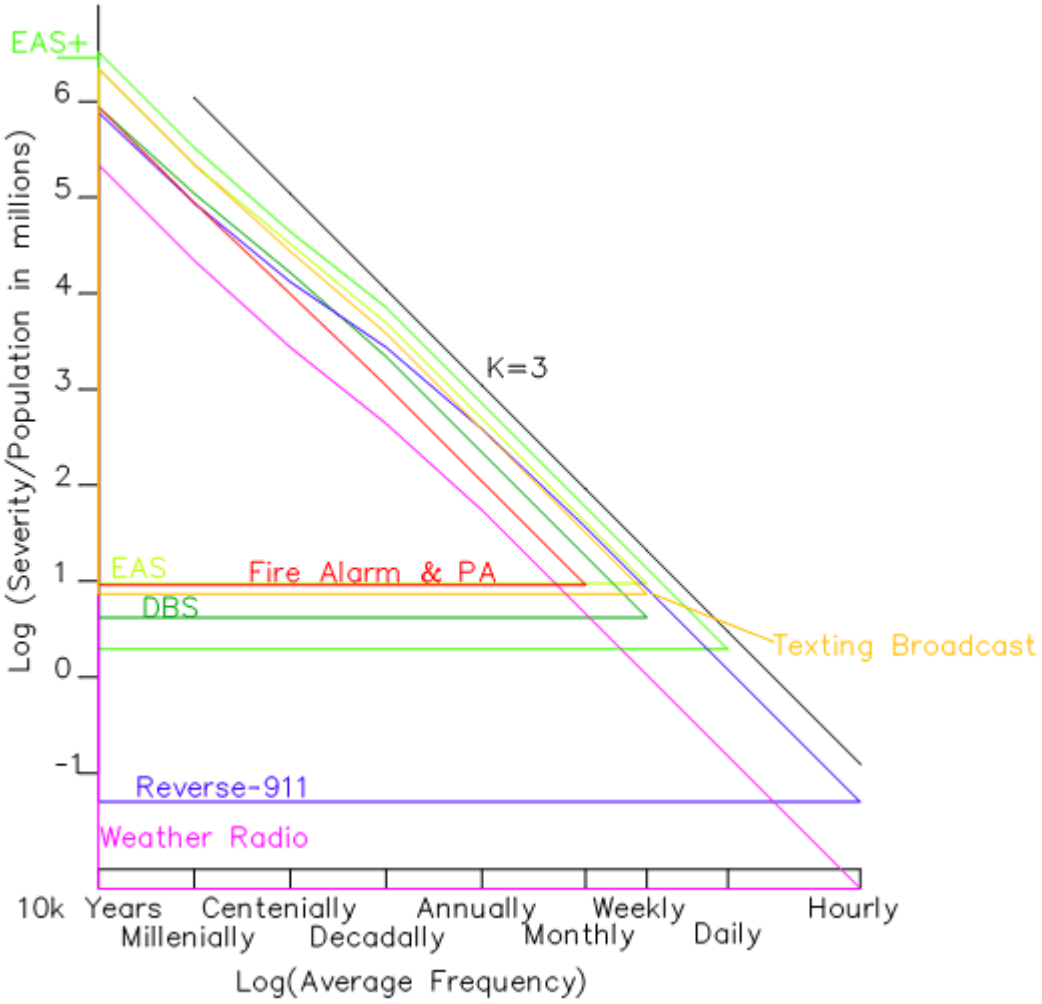
Value Based Paradigm

- The value of a message is the Importance of the message times the number of recipients it is important to, less the Annoyance of the population receiving the message who are not intended recipients.
- This depends on the Event code & spectra and the Customer selection ability to select important messages.
- Market research is needed

Value of different technologies

- The different technologies can vary by;
- P, the penetration into the coverage area as a fraction of the population reached at any time.
- R, the response time of the technology, earthquakes require rapid response
- F, the maximum frequency of usage
- Selective alerting with Broadcasting considerably adds to the value & resilience

EW4All Value Graph, the accuracy of the values needs research



This graph is a rough approximation, view the green EAS+ line.. A Survey to measure The source data would improve this. The K is assumed to be 3. This follows the y=K/f noise curve, which is comparable to the Zipf law, which gives rise to the Pareto Principle.

EW4All components

- Integrated Public Alert Warning System IPAWS in USA.
- Common Alert Protocol & EDXL based
- Varying alerting technologies, e.g.;
- Cellphone Text Broadcast
- Email/texting
- Emergency Telephone Notification (R911)
- Fire Alarms & PA Systems (& Sirens)
- Intelligent Internet Speakers also possible with Alert Fatigue Avoidance, FSK modem audio may be used.

6 Improvements for Broadcasting

- Low Data protocol for Radio Broadcast
- Forward Migration from existing systems.
- Priority scheme, 1 is immediate override, others can be scheduled by automation
- First responders exercise mode
- Future delivery to computers of alerts and publication files (CAP Broadcast on ATSC 3 TV)
- A Broadcast tunneling mode is possible to provide internet redundancy. This is called a Digital Daisy Mesh.

4 Broadcast improvements - 2

- Response time in seconds for priority 1, can be an earthquake warning system.
- Selectivity by location by county sector or polygon with recipient category defined
- Car radios can use polygons with navigation systems, good for jurisdictions
- More Event Codes for local emergencies

4 EW4All improvements -3

- Selectivity by polygons to 1 yard/meter resolution
- Selectivity by receiver category (vehicles, Intelligent Highway Sign)
- Selectivity by user category (e.g. first responder)
- Customer adjustable selectivity, by feature or other (e.g. priority)

7 EW4All improvements -4

- Country code, Language code, and up to four languages of audio on TV.
- AMBER (Child Abduction Alert pictures
- To Fire Alarm/PA systems possible
- Multistate broadcast coverage possible for message routing (e.g. NYC to 3 states)
- Automated QC and value calculation with monitoring receivers and emails using the FSK header information format
- CAP Broadcast mode for file broadcast.

2 EW4All improvements -5

- Standards based architecture means that consumer electronics manufacturers can add this as a feature for the small additional cost. Also, other countries adopting this would be aided by the volume economics of consumer electronics. Selectivity in Broadcast Receivers
- CAP becoming world standard, EDXL is a standard, Suggested Message Templates based on historical English messages available for spectra for over 40 languages.

3 EW4All improvements -6

- An EW4All radio message can be used to regenerate a CAP/EDXL message. This is useful in the event of CAP distribution network failure.
- Existing EAS encoder/decoders are already available, with an application upgrade that also supports the EW4All specification available soon
- Compatibility of EW4All with broadcast playout automation is VERY important.

EEWS Processing Time Budget

- P wave processing & message 0.4s
- Earthquake Message processing 0.1s
- Transmission time 0.2s
- EW4All encoder processing 0.1s
- Consumer receiver processing 0.3s
- Alert tone duration SEWS 0.7s
- “Earthquake” audio duration 0.3s
- TOTAL 2.1s
- Expanding rings of receiver countdowns possible

Conclusion

- Numerous problems, and numerous solutions to address them, including market research
- Standards for Computer Aided Dispatch can be compatible e.g. IEEE1512, TSO.
- Some complementary software appropriate
- Deployment will take time, but transistor prices are falling. Should become an insignificant extra cost for this consumer electronics feature. Consumer electronics software is VERY important . https://kynx.us for downloads