



The Radio Amateurs' Emergency Network

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RAYNET Emergency Planning Team Leader



# RAYNET

**RAYNET is the UK's National  
Amateur Radio Emergency  
Communications Organisation**

Its name is made up from  
**The RA(Y)dio Amateurs' Emergency  
NETwork**



# THE BEGINNING



RAYNET was formed following the East Coast Floods in 1953, when radio amateurs first provided emergency communications.



# **Amateur Radio Emergency Communications in the UK and the Licence Regulations**

**Amateur Radio Enthusiasts have to pass exams to obtain a  
licence**

**Amateur Radio in the UK is regulated by  
OFCOM  
The Office of Communications**

**The UK Licence permits us to pass messages  
for organisations that  
are called 'THE USER SERVICES'**



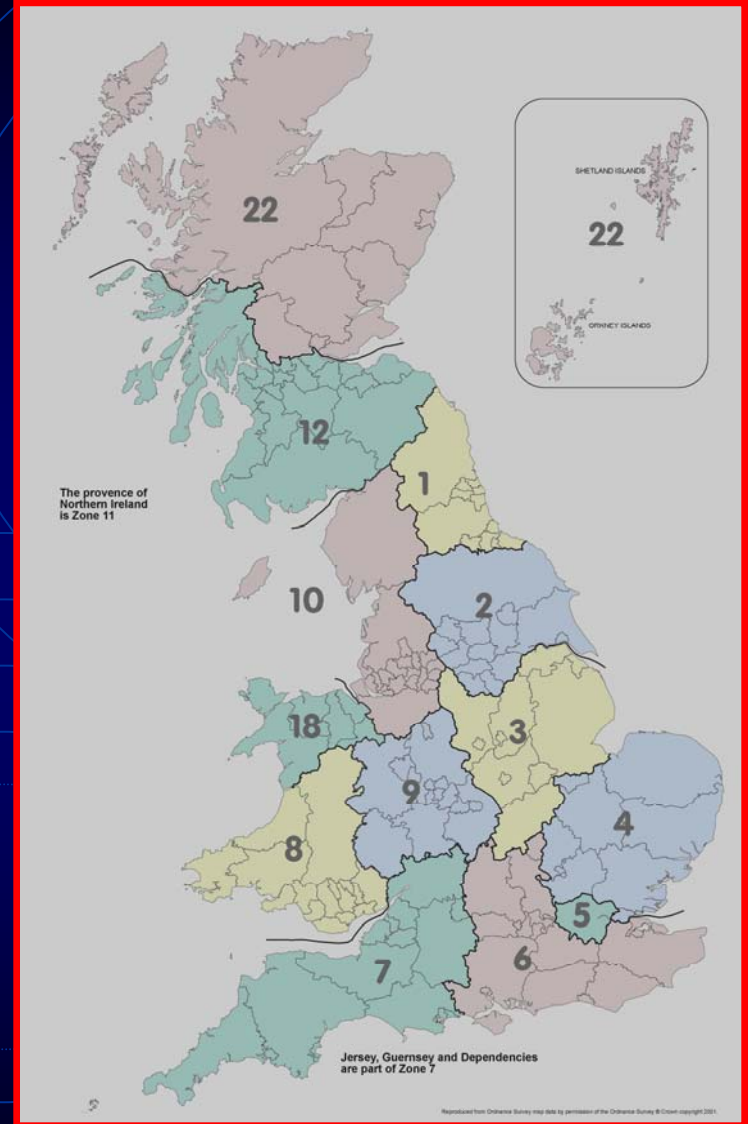
# USER SERVICES

- United Kingdom Category 1 or 2 Responders
- Voluntary Organisations
  - British Red Cross
  - St John Ambulance
  - St Andrew's Ambulance
  - WRVS
  - Salvation Army



# RAYNET ORGANISATION

The United Kingdom is split into a number of areas – called ZONES – and each has its own Zonal Co-ordinator.





# What do we offer?

In times of major civil emergency, existing communications can become rapidly overloaded.

## RAYNET can offer:

- Additional flexible communications links to complement established systems
- Members who come from a variety of backgrounds and who can bring a wide range of skills, knowledge and expertise, and local knowledge
- Established local and national contacts



# Current Capabilities

- Approximately 2800 members nationwide
- Tactical communications to the community at VHF and UHF
- Members own equipment
- Some groups maintain small stock of 'specialist' equipment
- Smaller core of members retain Nationwide HF capability for wide area incidents
- Ability to call on the wider Amateur Community resources



**Greg Mossop**

**RAYNET Technical Team Leader  
IARU Emergency Communications  
Co-Ordinator for Europe, Middle East  
and Africa**



# Barriers

Eine laute und deutliche Sprache ist von Vorteil. Zur Durchführung von internationalem Notfunkverkehr sind zudem gute Englischkenntnisse erforderlich.

Do we have a language barrier for interoperability?



# Major Incident Report

- Casualties
- Hazards
- Access
- Location
- Emergency Services  
(range and commitment)
- Type of incident.



# Major Incident Report

- Major Incident declared (or hospitals to standby)
- Exact location
- Type of incident - brief details of types and numbers of vehicles, buildings, aircraft, etc. involved
- Hazards, present and potential
- Access and egress
- Numbers and types of casualties
- Emergency Services present and required



# Major Incident Report

- Who
- What
- Why
- When
- Where
- How



# Barriers

- Messages must be passed accurately
  - We may have to cope with different dialects of 'Airwavespeak'
- We must pass messages quickly
  - There must be no translation delay.
- If we cannot standardise then we must train



# Does format matter ?

- There are a couple of answers...
- Yes, if we are having to consider international interfaces
- Maybe not, if the content is well understood



# What about the content ?

- Data Protection concerns
  - Operational Security concerns
  - General eavesdropping
- 
- Sometimes the need to communicate outweighs the need for secrecy, otherwise valuable resilience modes may be lost



# L'Aquila 2009



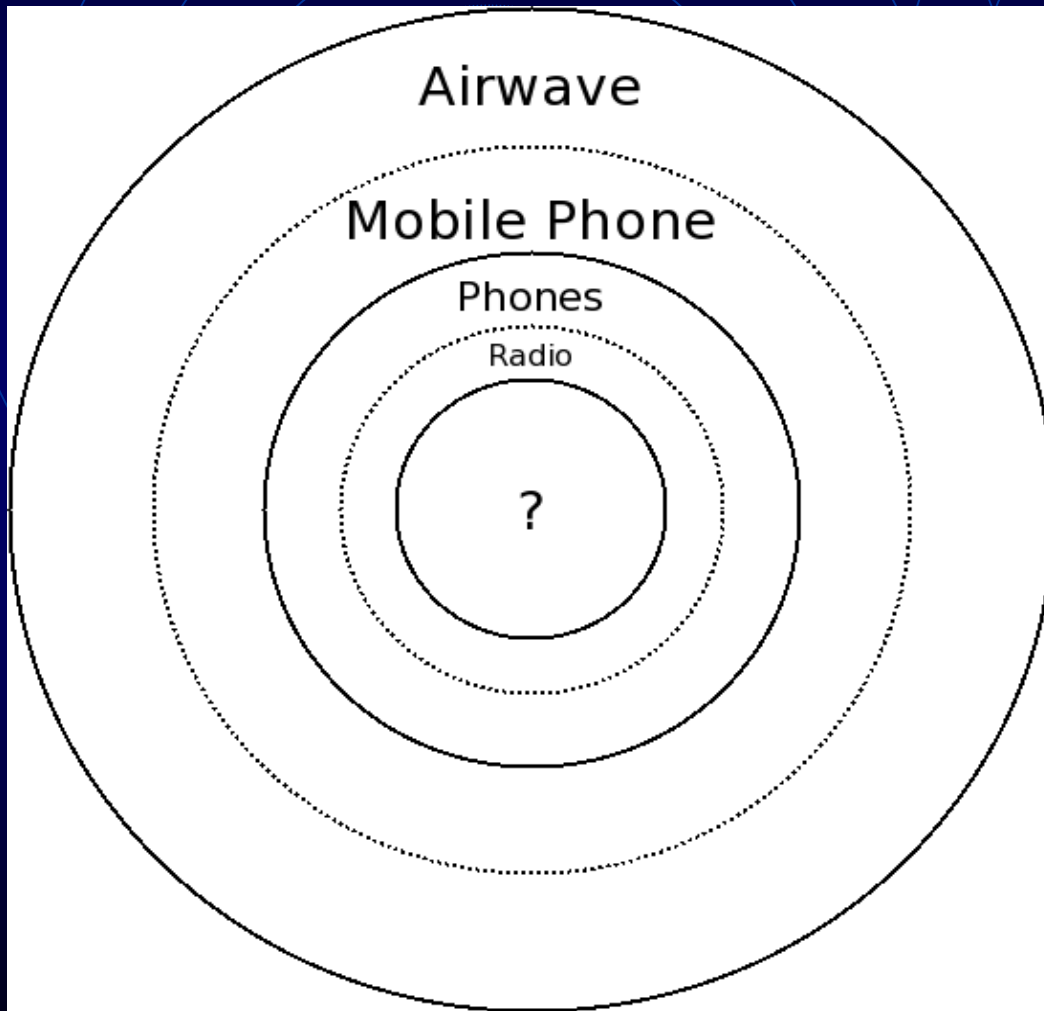


# The IT Department's view

OSI Model			
	Data unit	Layer	Function
<b>Host layers</b>	Data	7. Application	Network process to application
		6. Presentation	Data representation and encryption
		5. Session	Interhost communication
	Segment	4. Transport	End-to-end connections and reliability
<b>Media layers</b>	Packet	3. Network	Path determination and
	Frame	2. Data Link	Physical addressing
	Bit	1. Physical	Media, signal and binary transmission



# Layered Fallback



The Onion model

As systems fail  
we peel off layers  
to reveal the most  
resilient.

But do we  
consider the  
interfaces  
between layers ?



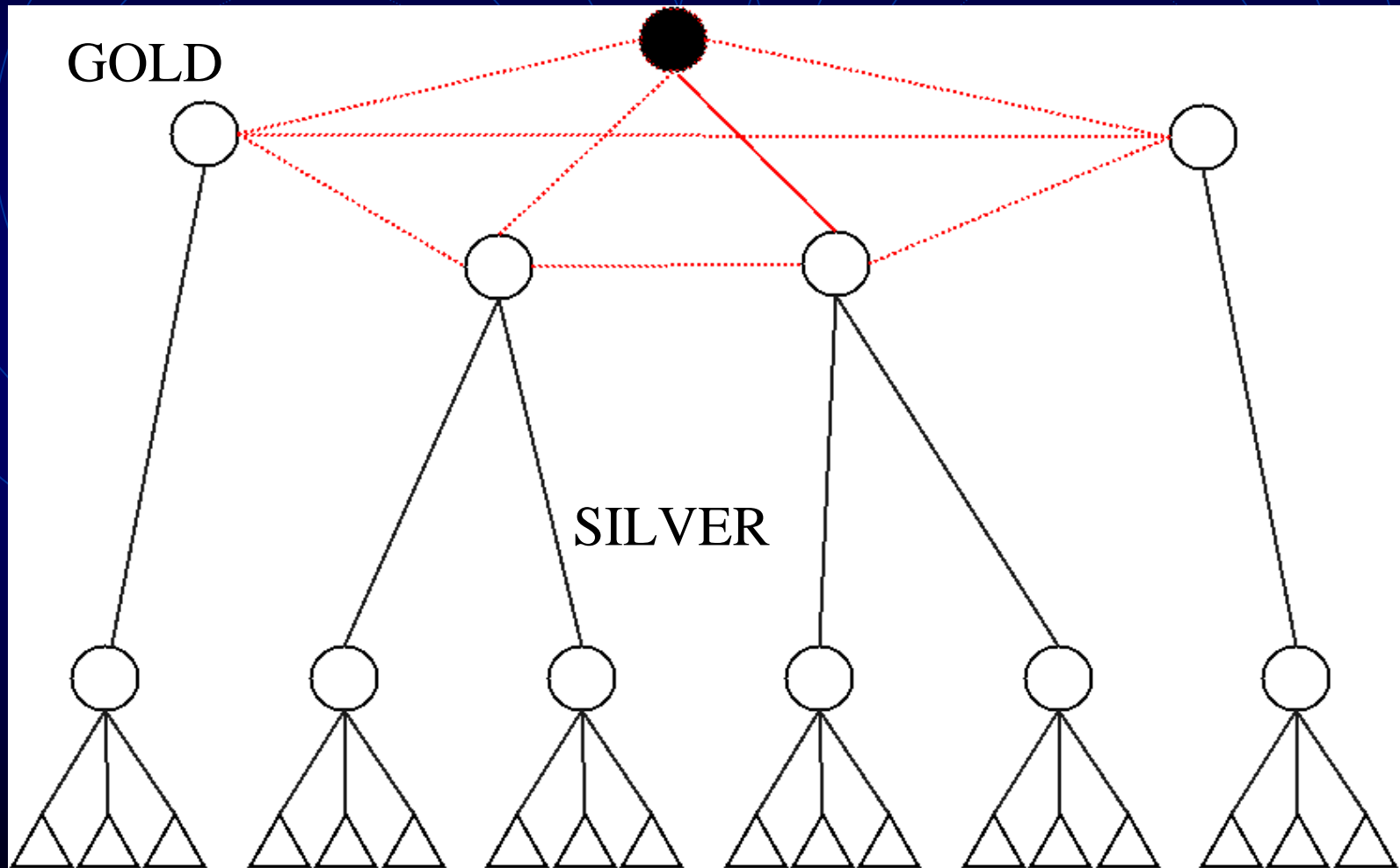
# Dependencies



Modern communications methods have evolved, building on the foundations of earlier systems.

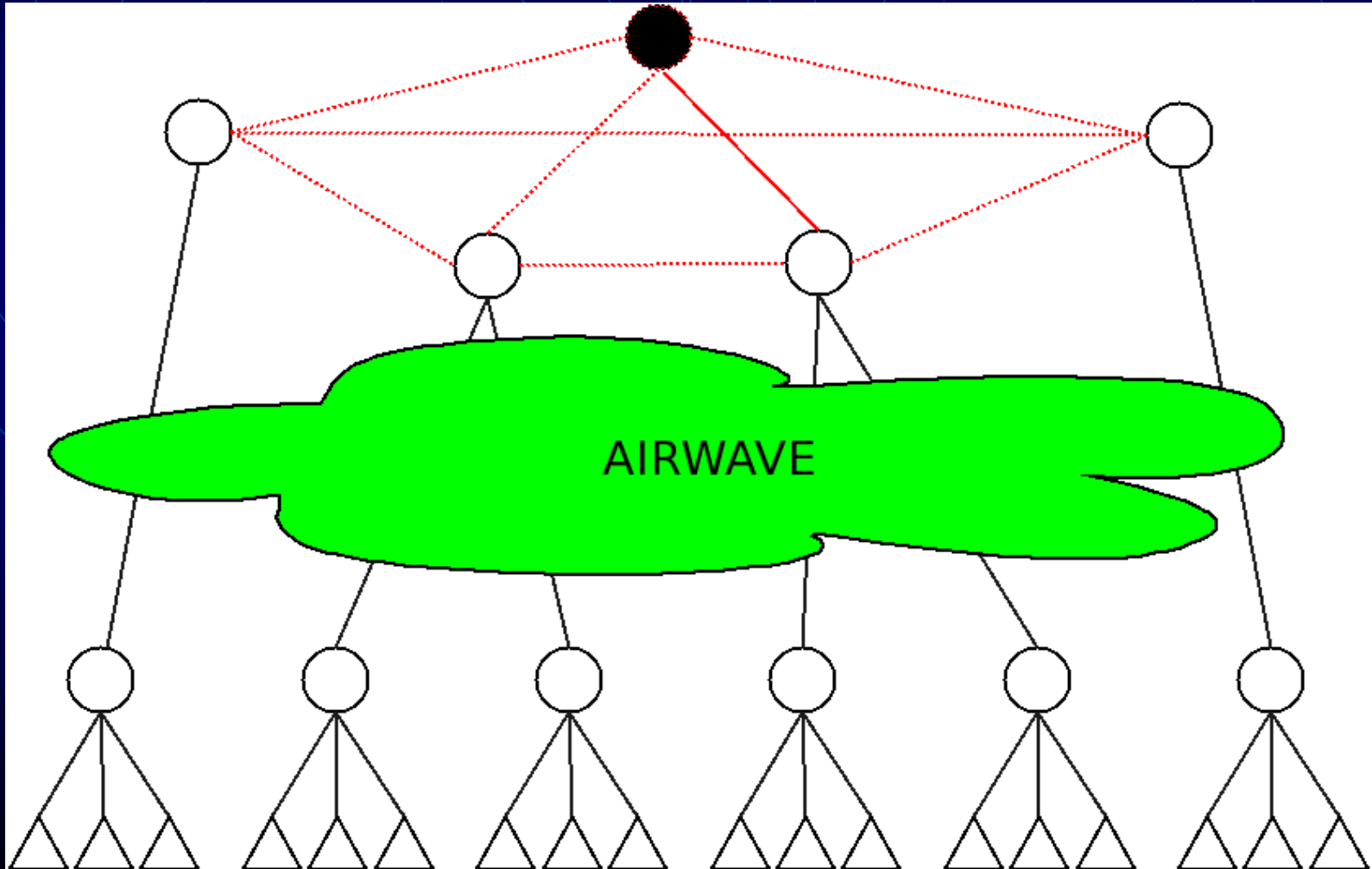


# Command and Control





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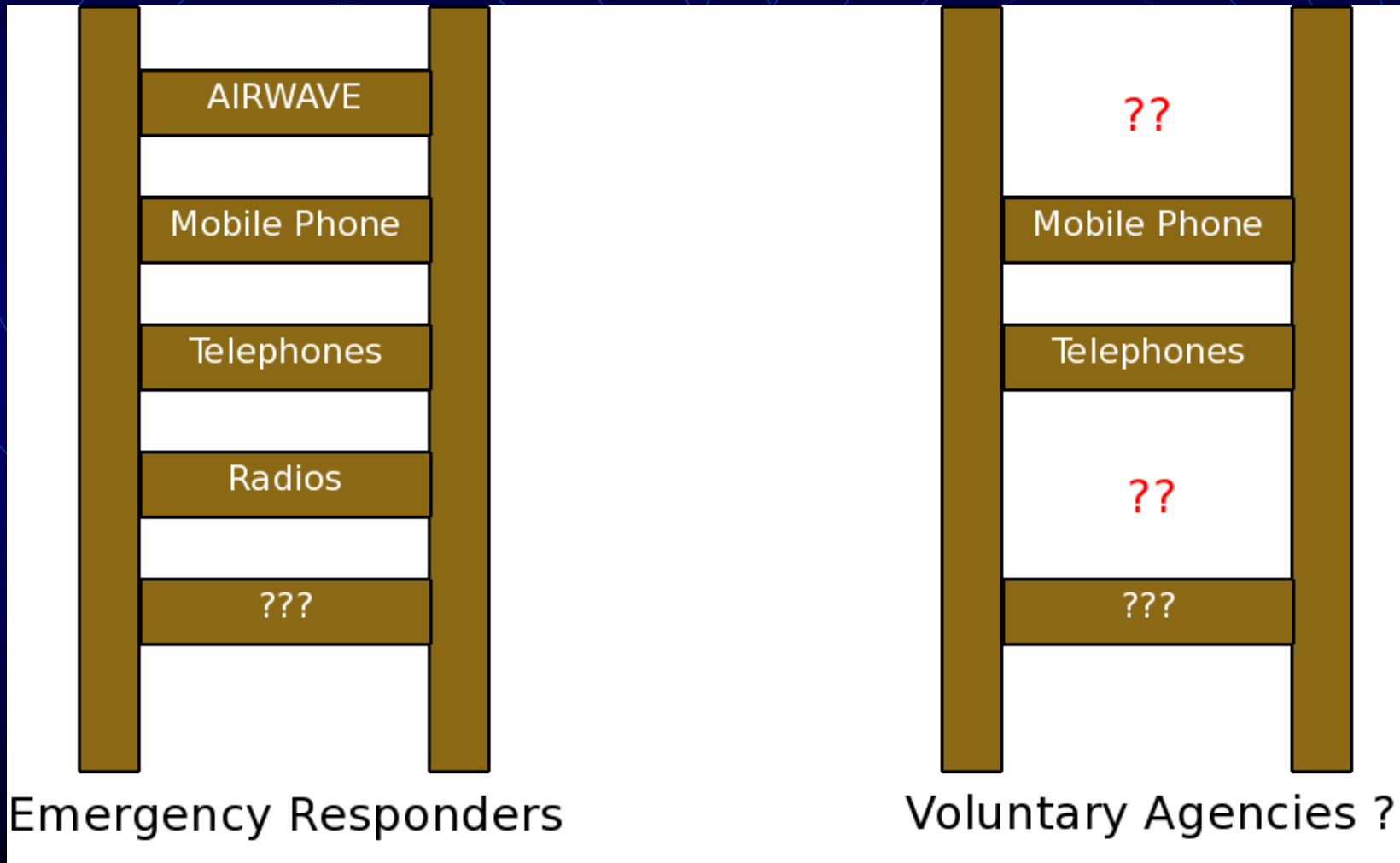


# Command and Control

- More services are moving to Airwave
  - This has some benefits for interoperability
  - This brings some problems for Voluntary agencies who are not on the Sharers List or cannot afford the system
- How does this affect the layered fallback model ?

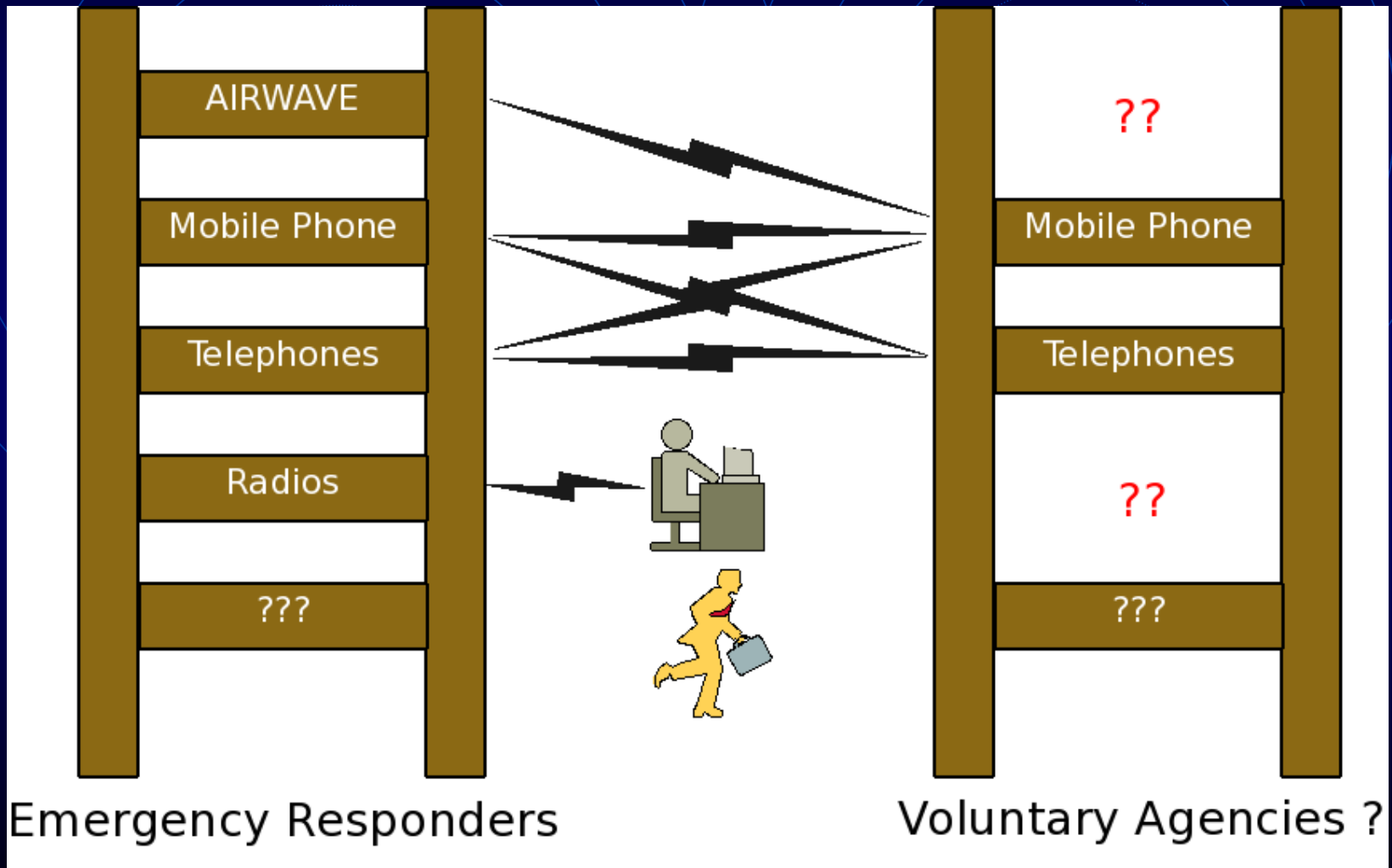


# Are all users the same ?





# Interface requirements





# Interface problems

- To move messages between layers introduces delays
- It also puts increased dependency on public systems
- There can be a lack of trust in passing messages over non-routine systems



# The Amateur Service can...

- Provide a strong, decentralised, resilient network
- Provide disaster relief communications
- Take non-urgent messages off priority networks preventing overload

... with appropriate support and planning.



# The Voluntary Sector can ...

- Provide extra, trained personnel
- Provide specialist resources

But to make this work, we need to have good information flows to and from the primary emergency services.



**THANK YOU**