



Radio Over IP (RoIP)

V2

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1. BASICS - overview

BASICS is the essential toolbox, offering a simplified approach to the deployment of networking, voice and IP solutions.

Each BASICS device provides a number of ports for connection - either to an IP WAN such as a satellite modem or over a local fibre optic connection for local reachback. Designed for applications where efficiency is critical - power, space or bandwidth - BASICS provides specific solutions for every day challenges in communications deployment.

Each BASICS unit offers a single, simple primary mode of operation, such as IP Routing, Optimisation, Voice (including STE / STU support), Four-Wire or Radio Relay, and all can be software enabled with network router functionality too.

All the BASICS platforms can be delivered in one of the following formats, ensuring both standard product network operators and tactical systems integrators have a form factor that meets their requirements.



2. The Problem to Solve

Radio units operate generally to line of sight (VHF). Distance, topographical blockages mean that the push-to-talk radio operations remain localised, thus a requirement exists to permit these push-to-talk radios to operate over IP networks such as BGAN, extending VHF operations "beyond line of sight" and over the horizon.

3. The Vocality Solution

Simple to complex radio networks can be interconnected over any intermediate IP or serial network. At the same time bandwidth can be reduced and the quality of interconnects increased.

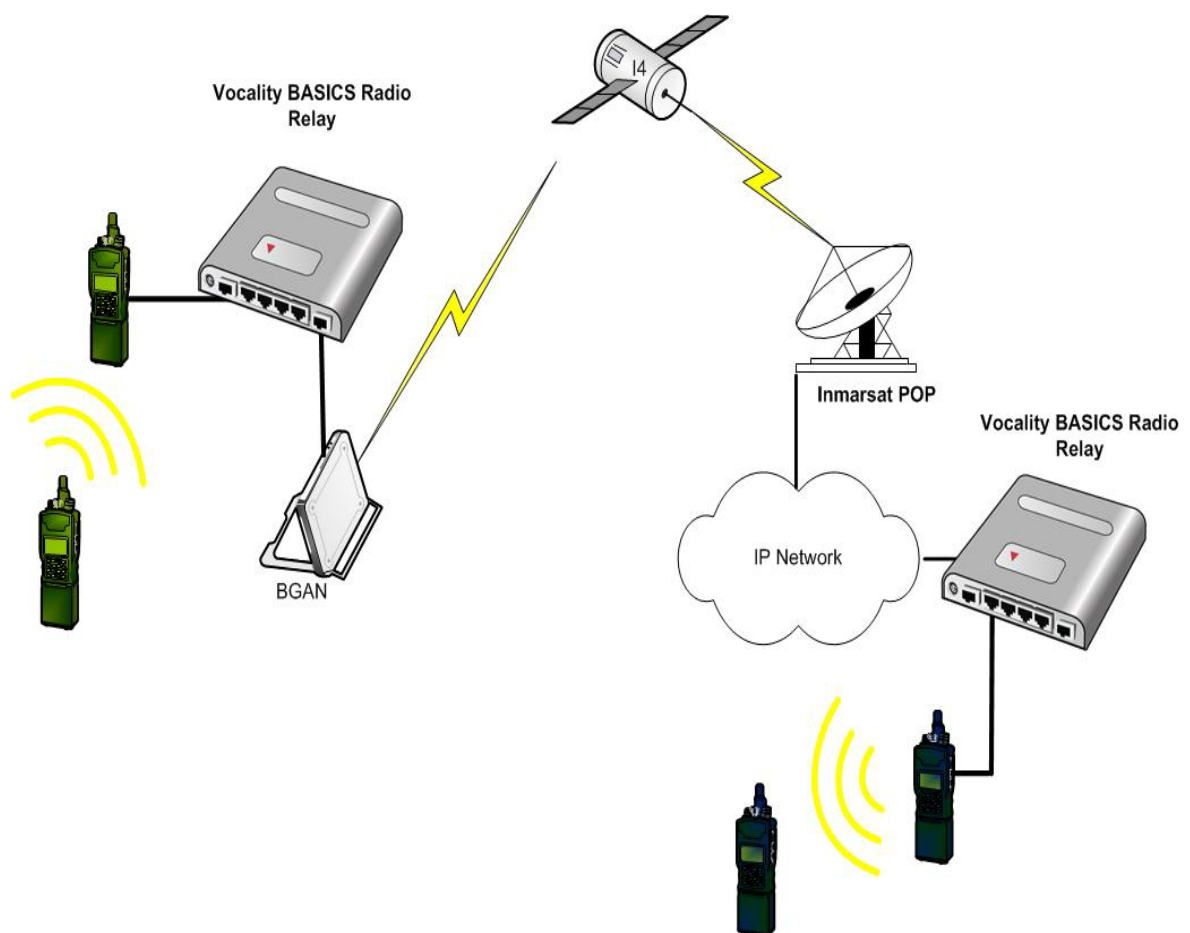


Figure 1 Topology Overview

4. **Vocality RoIP Features**

The Vocality BASICS Radio Over IP (RoIP) solution supports the radio extension scenario in a multitude of ways, from simple point to point mode for extending radio networks over intermediate links e.g. satellite or Internet, to complex networks using a central media server.

Devices can be used as standalone media gateways converting audio radio signals to IP SIP, RTP Unicast or RTP Multicast. All Vocality four wire devices support this functionality which means any Vocality Pro voice cards, the BASICS Radio Relay card and the BASICS Four Wire cards.

5. **RoIP Technical Details**

Voice Activation Detection (VAD)

Voice Activation Detection (VAD) can be used to detect active audio packets on both the radio connection and also the SIP connection in order to activate the Push to Talk (PTT) on the radio for it to transmit.

Silence Suppression

To reduce the amount of bandwidth used, silence suppression can be enabled on the devices

Manual Activation

As well as VAD, manual activation can be used to key the remote radios. This enables the units to be used with push-to-talk (PTT) headsets or operations centre systems.

PTT Timers

Adjustable timers are available on the Vocality system to prevent bouncing of the PTT to the radio and also from the radios falsely keying each other due to the squelch feedback experienced on some radios.

Switchable Full Duplex / Simplex Operation

A feature is available to force the network into a simplex operation by having the ability to kill all receive audio whilst the PTT is active.

Bandwidth Optimisation

The Vocality devices can be used as standalone media converters to interconnect with a larger network or they can be used as a pair, or hub and spoke, in order to reduce bandwidth and increase the quality of the link by removing jitter.

Compatible Media Conferencing Systems

BASICS Radio Relay has been tested successfully with the following media servers:

- CoCo
- Twisted Pair WAVE

The following SIP Gateways have been successfully used to connect radio networks to phone subscribers by using the BASICS Radio Relay:

- Cisco Call Manager
- Cisco Call Manager Express
- Asterisk
- 3CX

Compatible Radios

Whilst all radios should be compatible, the following radios have been tested successfully with Vocality BASICS Radio Relay:

- Harris PRC117
- Thales PRC148
- Harris PRC152
- Motorola XTS1500
- ICOM

Please refer to the Vocality website for a full list of tested commercial and military radios tested with the BASICS Radio Relay solution

6. Typical Users

- First Responders
- Broadcasters
- Aid agencies
- Oil and Gas
- Mining
- Military
- Multi-radio sites
- Construction
- Marine
- Security,
- Police
- Road and Rail

7. Setup

7.1 BGAN setup

BGAN is connected to the Vocality RoIP BASICS unit via Ethernet connection. RoIP would be typically supported over the BGAN system using the Standard IP / Background IP bearer.

7.2 BGAN IP PDP Control

BGAN's IP (PDP) session can be controlled a number of ways, from having an IP session automatically start at registration, Automatic Context Activation (ACA) based on LAN traffic through to user manual control via Launch pad. The choice is based on the users requirements and the BGAN terminal.

A recommendation would be that the IP PDP session on the BGAN, regardless of manufacturer or version is controlled via ACA, Automatic Context Activation.

With ACA configured, once the BGAN terminal has registered, an IP PDP session will automatically be started because of the presence of the BASICS RoIP unit attached via Ethernet.

Manual control of an IP PDP session using the Inmarsat Launch pad, a terminal specific built in MMI/GUI or in the case of the Thrane & Thrrane e700, the use of the external buttons to "connect" a pre- defined IP PDP session have all worked successfully with the Vocality BASICS RoIP units.

8. Further Details and Support

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