Get Your Weather Forecast via APRS Messaging

An eager Ham and an active Summits On The Air enthusiast, Martin Nile - KI6WJP has created an APRS weather forecast auto responder gateway on the APRS network with the APRS call WxBot. The picture above shows the weather forecast I received on my HT that supports APRS messaging after sending the appropriate query message to WxBot.

APRS messaging requires a lot of components to be in place and working in order for it to succeed. The simplest is Radio to Radio simplex between two APRS enabled stations in range of each other. The most complicated is Radio to APRS-IS to Radio where the sender and receiver need to be in range of an internet gateway (IGate) that has both receive and send abilities which links the RF from the radios to the internet. This allows the end points to be completely separated from each other as the internet provides the means to span distances.

In my test I used my own personal IGate that is configured for both receive and transmit. The WxBot server is located near Mt. Shasta in California. For the recipient of the message, I entered *WxBot* and sent the message *Dundee, OR tomorrow.* Typical of APRS messaging, my HT kept sending the message (pausing a minute between transmissions) until I received an acknowledgment that the IGate had received the message. Several seconds later my HT informed me a message had been received and I was able to see the weather forecast pictured on the front page.

Not having done much APRS Messaging, but since I was using my IGate, I was able to trace most of the process and infer other pieces that occurred. In some of the attempts I found where the process can break down. Breaking the messaging down into steps this is what I discovered.

1. Originating station formats an APRS message for transmitting on a APRS enabled radio
    1. APRS messages are very similar to a text messaging on a flip phone. The text is written by using the numeric keypad. To type a Upper Case W on my radio, I have to hit the 9 key six times. First press gives me a lowercase W and then an X, then Y, etc.....
    2. The radio transmits the request using the APRS Frequency, where it is picked up by an IGate.
        1. Message is transmitted up to 5 times waiting on an ACK from the IGate, before it times-out.
    3. Messages over 64 characters must be split into multiple messages.
2. An IGate Receives the query from the APRS equipped radio.
    1. There are multiple events that could prevent the IGate from receiving the message.

1.If the APRS frequency is in use by another station, the stronger signal wins out and my lose a message.
2.If another message is being processed by the IGate, it may be sending the first message missing out receiving the second.

2. If it is received, the IGate decodes the message and uses the Internet gateway to transfer the request to an APRS Internet Server.

1.If this is the first time the APRS Internet server has seen that message it will transmit via the internet to all the APRS Internet Servers in the world.

1.See http://www.aprs2.net/serverstats.php to see all sanctioned APRS T2 Servers URL's and locations.

2.Since all APRS Internet servers have the message, any gateway attached to a APRS Server can receive the message no matter which one it is connected to.

3.Since the WxBot Server is connected to an APRS Internet Server, it provides the WxBot gateway with the request and the WxBot looks up the weather forecast.

1.The WxBot must be connected to the APRS-IS this give it the location of the weather forecast responder.
2.Being this is APRS you can find the location using aprs.fi looking up WxBot.

4. The APRS Internet Server that WxBot is connected to, receives the weather forecast and it is passed to all APRS internet servers to be passed on to the requesting radio by a transmitting IGate.

1.The original APRS message passed by the APRS enabled radio contains the GPS location of that radio, and this location is passed along with all messages.

5. Since the location of the receiveing radio is known from the orginal request, a transmitting IGate near the requesting radio will pickup the message and transmit the message on the APRS frequency.

6.The APRS enabled radio receives the response.

1. My Yaesu beeps and flashes a light when it has received a message.
2. Unfortunately I found that if my dual channel had one channel is busy, I would miss the message from the IGate.

As you can see this is a complicated process, there's a whole lot of stuff that has to exist to even get one message through the Radio to APR-IS to Radio process. Now, do that round trip for every single message in a QSO, and you can see the miracle that APRS messaging QSOs represent!

So if you are within reception distance of my IGate W7OWO-5 and you have an APRS Messaging enabled radio, enter the message tomorrow and send it to WXBOT and you may receive tomorrow’s weather forcast.