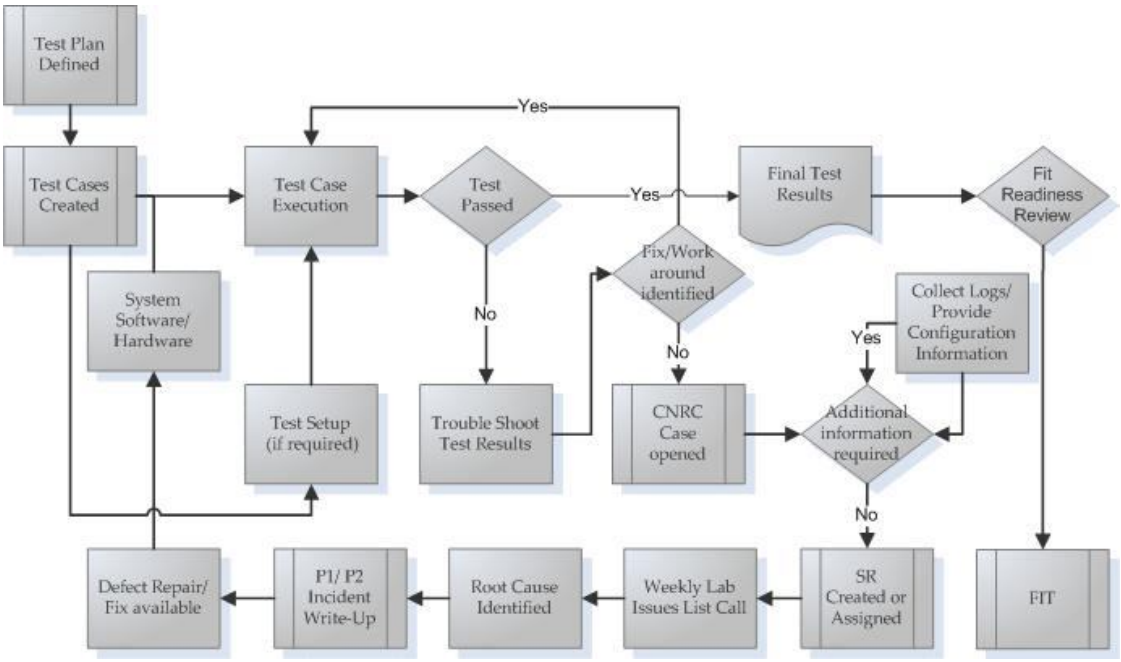
# Wimax Service Optimization

## Client Overview

The client is a selected WiMax infrastructure provider and implementer for major 4G (fourth generation) network and communications in North America. As a 4G network design and integration provider, the client's project scope ranged from installation, provisioning, upgrading, and supporting APs.

## Challenge

The technical problem facing the technology development lab was making sure the lab environment was error free. This included test setup, configuration, and other parameters. During the feature testing, if a problem was found, the development and deployment team would locally trouble shoot and resolve. However, if the problem was beyond level two support, the development team would collect logs and critical information to resolve the issue. Once a fix was available, testing would be preformed to verify the corrected design. Below is the working flowchart for process and support:




The security on the WiMax system was another challenge that needed to be updated. The security team used a packet generator which enabled them to create user defined UDP/TCP packets. This was simulated with various kinds of attacks for example, a *denial of service attack* which would make a computer resource unavailable to its users, preventing an internet site or service from functioning efficiently or at all. Or the *man-in-the-middle attack* which is a form of eavesdropping. The attacker makes independent connections with its victims and relays messages back and forth, making them believe they are talking to a creditable person. The victim has no idea that their entire conversation is being controlled by an attacker.

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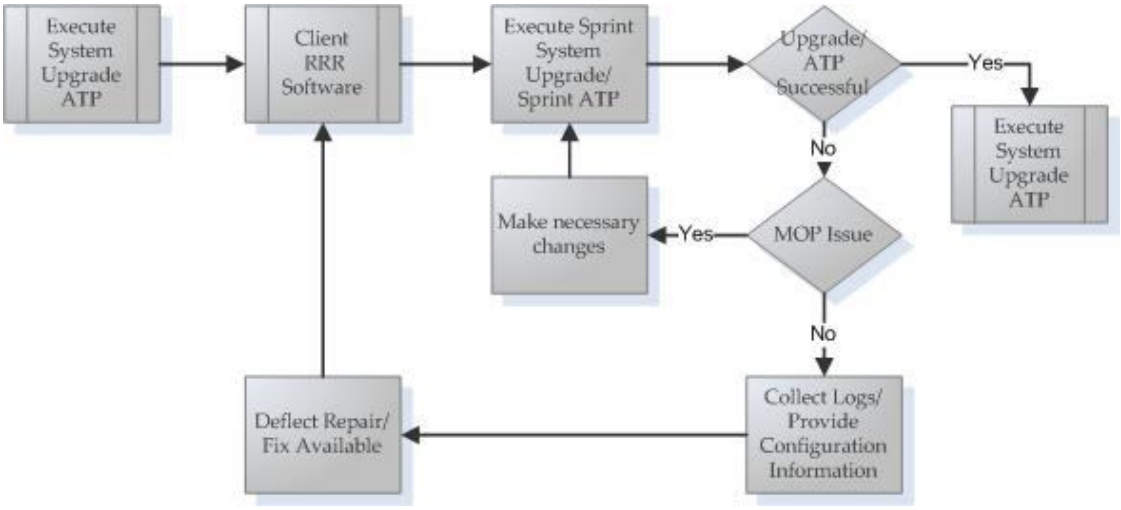
## Challenge cont.

We provided the client with stability for AP's device software and an error free environment. The following details of the software upgrade procedure-is displayed below in a work flow diagram completed by Creospan's engineering team:




## Creospan's approach

It was the responsibility of the Creospan engineers to protect the system against these types of attacks. This was done by making the system more rigid, while keeping the normal functionality of its elements unaffected. Engineers worked simultaneously with the client on updating, maintaining and finalizing the access lists for the foreign agent. Once the access lists were tested against multiple attacks, the normal performance elements in WiMax were examined and evaluated. The results were forwarded for use in commercial markets.

## technical Solution

The engineers provided support for network optimization and site acceptance efforts by assisting with troubleshooting and various innovative projects. The engineers supported the client in fulfilling their commitment to network the service provider by the following support expertise:

- The creation of CPEs based VoIP array
- WiMax based T1 emulation
- WiMax device conformance testing
- Upgrading all network elements (APs, routers, devices, etc) by optimizing, testing feature supports, troubleshooting and documenting
- Executing lab activities by upgrading technical support and testing efforts
- Implementing RF optimization by drive tests, and tool analysis etc.
- Enforcing site acceptance by market site installation, commissioning and provisioning the AP's