Wi-Fi / Wireless installation at the village

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CWNE #108

The enterprise level Aruba AP-205H installations at a village in North-East Thailand

"Free" Aruba Wi-Fi Access Point (APs) at the Wireless Conference

At several Wireless LAN Professional conference (WLPC) some vendors gave away Wi-Fi equipment, antenna's and tools. Aruba was one of them and they provided in 2014 Aruba AP-225 APs (3x3:3) and later on in 2015 onwards via vouchers the AP-205H APs (2x2:2) were shipped. First of all I want to thank **Sean Rynearson (@srynearson)** with his very good support to ship and to get these APs over to Asia. But what to do with these 5 devices? The AP-225 I have been using them in CWNA training to do IEEE 802.11ac Wi-Fi performance tests (up to 1300 Mbps at 80 MHz and 3x3:3 and Short Guard Interval) and to show the limitations on the clients together with spectrum analysis tools (see my twitter log at @globeron for posted performance tests done during the years and to achieve throughput speeds up to 1 Gbps with a single laptop and to push the spectrum to the limits with Iperf2 and later on Iperf3). The AP-205Hs I also wanted to use for training (as they are smaller and easier to travel with), but I left them in the closet for several years until April 2017 and to deploy them in a Thai village and temple in Thailand.

Village in North-East Thailand

About 10+ years (typically during the Thai New Year in April) we visit the family at a North-Eastern Thai village. One of the issues over the years is wireless connectivity (even on a mobile phone hardly "1-green-bar" signal quality could be obtained for voice communication and data traffic did not work at all. Usually I drove for about 7 minutes on a motorcycle to an open area where I was in reach of the telco tower to get maybe "3 to 5 green bars" signal quality and GPRS (General Packet Radio Service) technology was available at a very low speed. At least I was able to read e-mails to continue business).
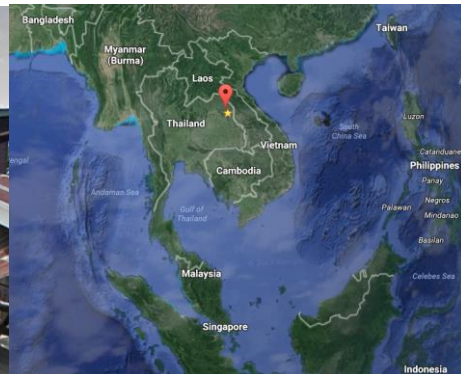
Around 5 years ago a Wi-Fi / ADSL (Asynchronous Digital Subscriber Line) AP was installed provided by the telecom operator and provided a backhaul speed of around 6 Mbps and was using IEEE 802.11n speed of 2 spatial streams (2x2:2) in

"Thank you, Aruba, and in particular Sean Rynearson (@srynearson) helping with the shipment to get the AP-205H to Asia."
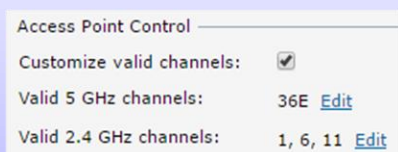
"Normally I had to drive about 7 minutes to get telecom connectivity"

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![Globeron logo]

Access Point Control
Customize valid channels: ☑
Valid 5 GHz channels: 36E Edit
Valid 2.4 GHz channels: 1, 6, 11 Edit

Government Keynote
H.E. Pichet Durongkaveroj
Minister of Digital Economy & Society
Kingdom of Thailand

ASIA PACIFIC
Digital Societies Policy Forum 2017
8-9 MAY 2017, BANGKOK

2.4 GHz spectrum only and the RF coverage was limited. The AP was shared with multiple devices, like older and newer smartphones, tablets, laptops. As it is a shared device still the experience was slow, especially as everybody was using social networks like Facebook, Line, etc. to connect to their families who live in other provinces in Thailand. In technical terms think about the flow of traffic from the mobile device, via the cables, to the DataCenters and to the social network applications (if these are hosted in Thailand or hosted internationally). The population in Thailand is around 65 mln. people and in the top 7 of largest active Facebook users and Bangkok is worldwide the number 1 city (ref.: http://tech.thaivisa.com/bangkok-has-the-largest-number-of-active-facebook-users-in-the-world/20965/). In summary, this means a lot of text, photo, voice, video type of traffic is going over these infrastructures.

During the initial setup, I also faced some issues and these are maybe helpful for people who setup the AP for the first time. Note it is a simple setup were most items are left at default:

- At my home, I had an existing Aruba Instant AP (IAP) active and was taking over the configuration session when I wanted to connect to the IP-address of the new AP-205H. This probably has to do with the adoption profile of AP to centrally manage APs with a virtual controller. As I was limited in time, I had to turn of the AP-225 (so that there was no other Aruba device on the network) to be able to reach the configuration interface of the new AP.
- Regulatory domain (IEEE 802.11d), these APs were for Europe and none of the Asian country codes could be selected and I had to select a country that is similar in regulations (like Transmit Tx power, EIRP Equivalent Isotopically Radiated Power, etc.). The reason I choose "NL", The Netherlands, because of the colors of the flag are similar as in Thailand (really nothing to do with regulatory domains).
- To configure 80 MHz bandwidth in 5 GHz is normally straight forward, but there are two areas where channels can be configured. During the initial setup, I did set it to a fixed channel 36 (20 MHz) for the 5 GHz. Later on when configuring the RF profiles to change it to 36E (80 MHz) it did not change and got stuck at 20 MHz First I thought it had to with the regulatory domain (NL), but later I found it when I factory defaulted the AP and went through the configuration again.
- Furthermore I created two different SSID profiles, one for 2.4 GHz, called "ThaiVillage24GHz" and one called 5 GHz, called "ThaiVillage5GHz". Aruba supports technologies like band steering, ARM adaptive radio management and many other features, but personally I like to know that my client connects to a 5 GHz channel or not (and find it easier to troubleshoot).
- Furthermore, I left the AP on DHCP (Dynamic Host Configuration Protocol) for interface Ethernet 0 (e0) to get a dynamic IP-address of the Wi-Fi ADSL modem local LAN network. Note the uplink of the ADSL still has the RJ-11 connector and the telephone wire backbone to the internet).
- PoE (Power over Ethernet) was not used as it introduced another device and it needed to be simple in setup. I used the AC-adapter
- The administrator account password has been changed for security reasons.
- I did not set it up for remote management to monitor clients, performance and environmental conditions like temperature, humidity, etc.

It is an enterprise level AP (which is not really needed for these types of environments and maybe from a business perspective not cost effective), but so far, I have been using the Aruba APs for normal daily usage without any issue (for example they do not reset or do not slow down so much, like what happens with several of the SOHO device I have been using).

The Ministry of Digital Economy and Society who is driving Thailand 4.0 initiatives has approved a project to expand the low-cost rural broadband. These villages will be using a fiber optic endpoint and free Wi-Fi hotspot. A total of 24.700 villages will be connected by the end of 2017. Thailand has about 75.000 villages.

This will generate new business opportunities whereby also local language support needs to be provided when the un-connected get connected to the internet.