

## ANALISIS 1

### ¿Qué quiere decir 300 Mbps de canal en un Router? y características básicas.

300 Mbps se refiere a la velocidad del enlace interno de la WLAN, esto quiere decir que es la velocidad entre el Router del operador y la computadora o dispositivo inalámbrico; esta velocidad es diferente a la velocidad real del servicio de INTERNET que brinda el operador (Relación de 2 – UP a 1- DW). La velocidad de la INTERNET lo define principalmente el proveedor ISP (Proveedor de servicios de internet).

Velocidad de internet	¿Qué tan rápido es?
0–5 Mbps	Muy lento
5–40 Mbps	Lento a moderado
40–100 Mbps	Moderado a rápido
100–500 Mbps	Muy rápido

VELOCIDAD DE INTERNET	CONVERSIÓN A MB	TIEMPO PARA DESCARGAR UN ARCHIVO DE 100 MB
10 Mbps	1,25 MB/s	80 segundos
100 Mbps	12,5 MB/s	8 segundos
200 Mbps	25 MB/s	4 segundos
300 Mbps	37,5 MB/s	2,67 segundos

## ANALISIS 2

### Características del AP:

What is the range of rap2260g?

It can operate concurrently at 2.4GHz and 5GHz, providing high-speed wireless access of 574Mbps at 2.4GHz, 1201Mbps at 5GHz and up to 1775Mbps per AP. Its coverage of over 20 meters makes it an ideal choice for many wireless scenarios, especially in offices, commercial industry, hotels, service scenarios, etc.

Compatible con el protocolo Wi-Fi 802.11a/b/g/n/ac/ax, RG-RAP2260(G) admite la tecnología de doble flujo MU-MIMO y ofrece antenas omnidireccionales integradas.

<b>Wireless Protocol</b>	802.11ax (Wi-Fi 6), 1775Mbps	<b>Network Port</b>	2 x 10/100/1000 Base-T
<b>Antenna</b>	Built-in Omni-directional	<b>MIMO</b>	2x2 @2.4 GHz, 2x2 @5 GHz
<b>Max/Recommended Clients</b>	512/100	<b>Operating Temperature</b>	0°C~40°C
<b>Dimension</b>	194mm × 194mm × 35mm	<b>Weight</b>	0.56kg (excluding mounting kits)
<b>Power Supply</b>	802.3at PoE, 12V/1.5A DC Adaptor	<b>Power Consumption</b>	<15.3W
<b>Certifications</b>	CE, ROHS	<b>Warranty</b>	3 Years

<b>Protocol</b>	802.11ax
<b>Throughput</b>	2977Mbps
<b>Client Capacity</b>	512
<b>Recommended Client</b>	110
<b>2.5GE Support</b>	
<b>Network Ports</b>	1 x GE

**Bandas de frecuencias activas del AP en el SSID llamado OS301:**

SSID ... Gestionar + Agregar SSID

SSID	Banda de frecuencia	Método de cifrado	Oculto	Protocolo de autenticación	Funcionamiento
OS301	2.4G 5G	WPA/WPA2-PSK	No	Autenticación deshabilitada	<a href="#">Edit</a> <a href="#">Delete</a>

1 en total < 1 > 10 / página

**Radiofrecuencia** Guardar

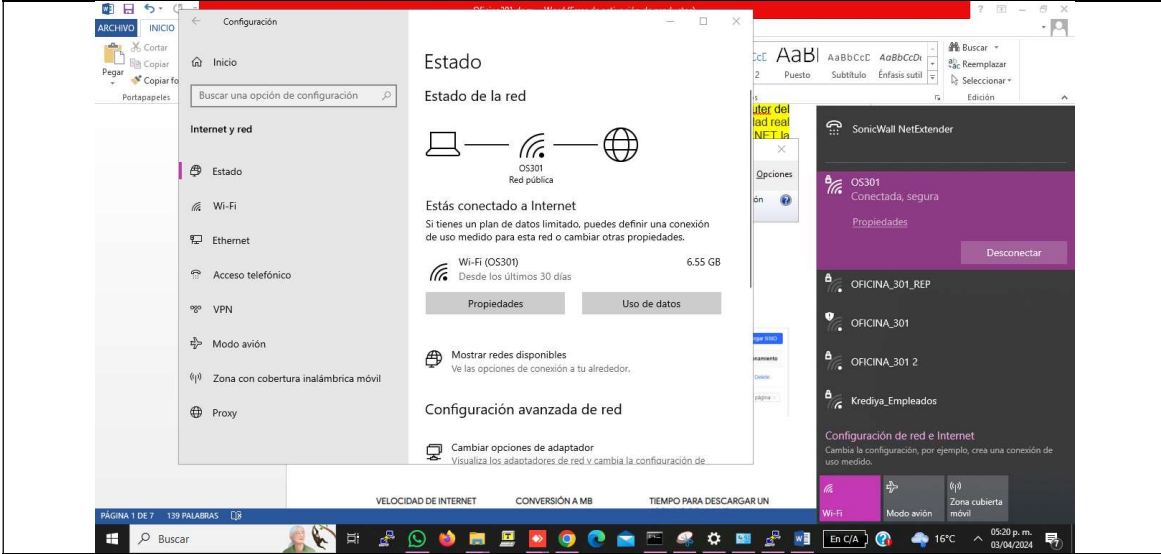
Pais o Región

Radio + Agregar radio

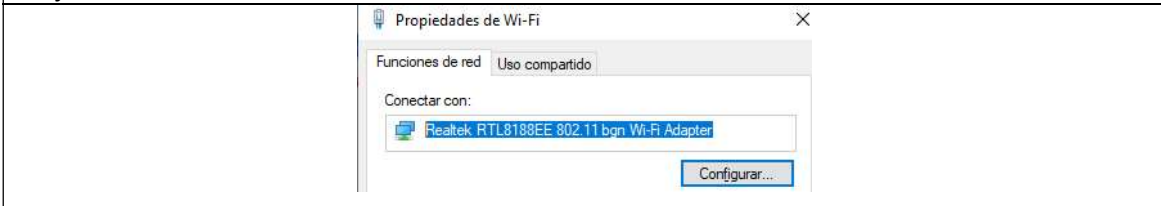
2.4GHz	5GHz
<p><input checked="" type="checkbox"/> Interruptor de Radio: <input checked="" type="checkbox"/></p> <p>Ancho de canal: <input type="text" value="Automático"/></p> <p><input checked="" type="checkbox"/> Límite de clientes: <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> Habilitar DFS: <input checked="" type="checkbox"/></p> <p><input checked="" type="checkbox"/> Límite de desconexiones <input type="range" value="50"/> Deshabilitado 5dBm -65dBm Recomendado</p>	<p><input checked="" type="checkbox"/> Interruptor de Radio: <input checked="" type="checkbox"/></p> <p>Ancho de canal: <input type="text" value="Automático"/></p> <p><input checked="" type="checkbox"/> Límite de clientes: <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> Habilitar DFS: <input checked="" type="checkbox"/></p> <p><input checked="" type="checkbox"/> Límite de desconexiones <input type="range" value="50"/> Deshabilitado 5dBm -65dBm Recomendado</p>

### ANALISIS 3

#### Verificación de conexión de un PC al SSID OS301:



#### Tarjeta de red Wi-Fi del PC:



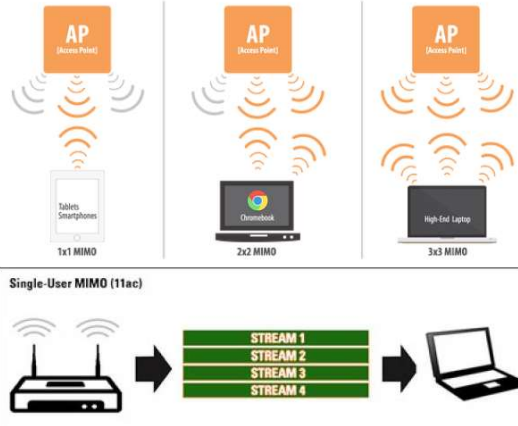
#### Detalles de la conexión WLAN del PC:



## ANÁLISIS 4

Análisis del porque la relación del vínculo del PC, respecto al estándar Wi-Fi y la cantidad de **Spatial Stream**:

Conexión a **2.4 GHz / 20 MHz / Wi-Fi 4 – 802.11n / 1 SS = 72 Mbps**



### INCREASED DATA RATES

Wi-Fi 6 delivers significantly higher peak data rates than Wi-Fi 5 (802.11ac) in 5GHz and 802.11n in 2.4GHz. Note that support for 8SS was not widely adopted with Wi-Fi 5, but is expected to be more common with Wi-Fi 6.

CHANNEL BANDWIDTH	1 SS	2 SS	3 SS	4 SS	8 SS
20 MHz 802.11n (2.4 GHz)	72 Mbps	144 Mbps	217 Mbps	289 Mbps	N/A
20 MHz 802.11ac (5 GHz)	87 Mbps	173 Mbps	289 Mbps	347 Mbps	693 Mbps
20 MHz 802.11ax (2.4/5 GHz)	143 Mbps	287 Mbps	430 Mbps	574 Mbps	1147 Mbps
40 MHz 802.11n (2.4 GHz)	150 Mbps	300 Mbps	450 Mbps	600 Mbps	N/A
40 MHz 802.11ac (5 GHz)	200 Mbps	400 Mbps	600 Mbps	800 Mbps	1600 Mbps
40 MHz 802.11ax (2.4/5 GHz)	287 Mbps	574 Mbps	860 Mbps	1147 Mbps	2294 Mbps
80 MHz 802.11ac (5 GHz)	433 Mbps	867 Mbps	1300 Mbps	1733 Mbps	2167 Mbps
80 MHz 802.11ax (5 GHz)	600 Mbps	1201 Mbps	1801 Mbps	2402 Mbps	4804 Mbps
160 MHz 802.11ac (5 GHz)	867 Mbps	1733 Mbps	2340 Mbps	3467 Mbps	6933 Mbps
160 MHz 802.11ax (5 GHz)	1201 Mbps	2402 Mbps	3603 Mbps	4804 Mbps	9608 Mbps

\* Data rate may vary depending on client availability.

**Conexión a 5 GHz / 160 MHz / Wi-Fi 5 – 802.11 a/n/ac / 1 SS / -55 dBm = 866 Mbps**

The screenshot shows the Ruijie Cloud management interface. The main window displays 'Detalles de la terminal' for an iPhone. Key information includes:
 

- SSID: OS301
- RSSID: -55dBm
- IP: 192.168.0.13
- Modelo de terminal: iPhone
- Tipo de terminal: -
- Sistema operativo y versión: ios
- Vendor: Apple
- Protocolo 802.11: K/V
- Velocidad máxima: 866Mbps
- Banda(s) admitida(s): 2.4G/5G
- Número de flujos de datos: Two spatial streams
- Protocolo de Wi-Fi: 11a/n/ac

 The interface also shows a 'Resumen' section with 'Experiencia Wi-Fi' and 'Enlace asociado' details, including signal strength and network type (WLAN).

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WLAN Standard	Band	VHT IE	HT IE	MCS	Available Bandwidth	Channel Type	Datarates
IEEE 802.11 b	2,4	-	-	-	20	CCK *1	1, 2, 5, 5 or 11
IEEE 802.11 g	2,4	-	-	-	20	OFDM *1	6, 12, 18, 24, 36, 48 or 54
IEEE 802.11 n	2,4	-	x	x	20 / 40	OFDM	
	5	-	x	x	20 / 40	OFDM	
IEEE 802.11 a*2	5	-	-	-	20	OFDM	
IEEE 802.11 ac	5	x	-	x	20 / 40 / 80 / 160	OFDM	
IEEE 802.11 ad*3	60			x	2GHz	*3	

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\*1 = In an IEEE 802.11b/g mixed environment CCK-OFDM channel is used

\*2 = The IEEE 802.11h specification extends the IEEE 802.11a specification only with the techniques of DFS and TPC to be non reactive with Weather radars

\*3 = The 802.11ad Directional multi-gigabit (DMG) PHY supports three distinct modulation methods:

1. Spread-spectrum, the Control PHY (MCS 0)
2. Single carrier, the Single Carrier PHY (MCS 1 to MCS 12) and the Low-Power Single Carrier PHY (MCS 25 to MCS 31)
3. OFDM, the OFDM PHY (MCS 13 to MCS 24)

**Conexión a 5 GHz / 80 MHz / Wi-Fi 5 – 802.11 a/n/ac / 1 SS / -63 dBm = 433 Mbps**

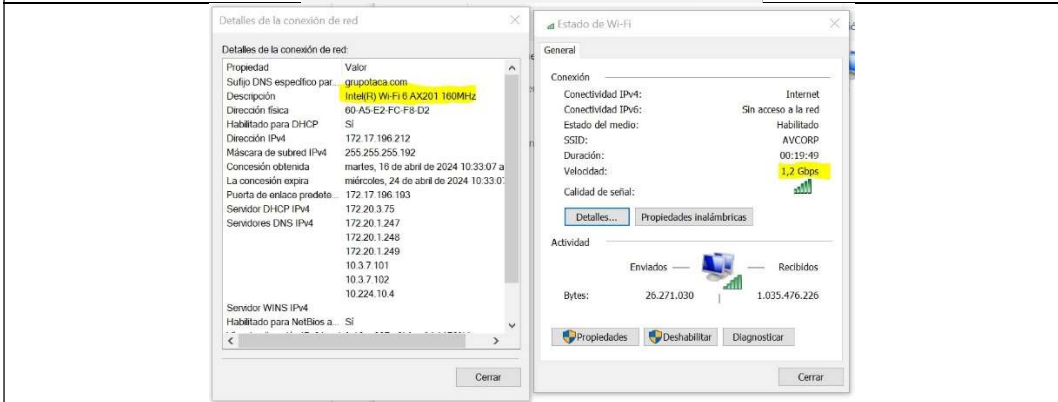
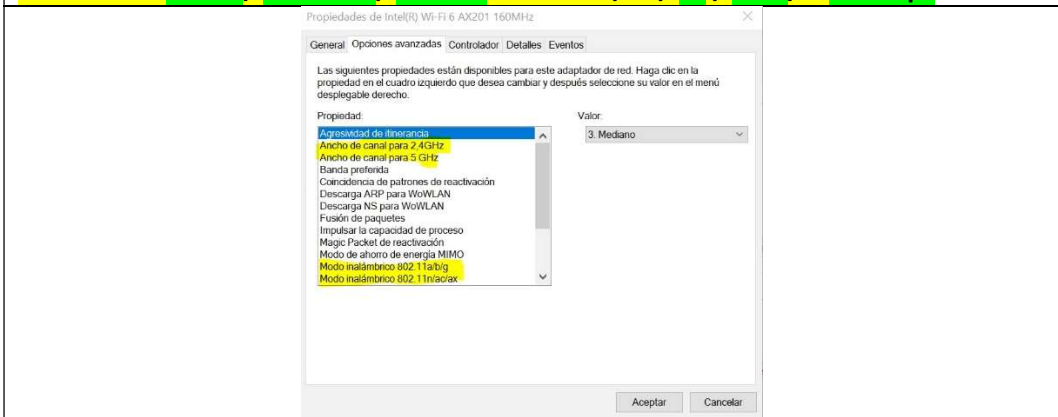
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**Conexión a 5 GHz / 160 MHz / Wi-Fi 6 – 802.11 n/ac / ax / 1 SS / = 1.2 Gbps**



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## Analisis 5

Análisis del porqué de las velocidad de DW / UP

**DWlink:** Aproximado al 50% del total máximo de transmisión del UPlink.

**UPlink:** Aproximado al 100% del total máximo de transmisión menos el 30% aproximado por perdidas de espacio libre, Diente de Sierra (Sawtooth Pattern), Shadowing, absorción y dispersión del espectro radio eléctrico transmitido (Fotones).

### 1. Perdidas de espacio libre (Free Space Loss):

Free space loss refers to the loss of signal strength as a radio wave travels through free space. It is influenced by the frequency of the signal and the distance it travels.

The formula to calculate free space loss (in decibels) is:

$$\begin{aligned} \text{FSPL(dB)} &= 10 \log_{10} \left( \left( \frac{4\pi df}{c} \right)^2 \right) \\ &= 20 \log_{10} \left( \frac{4\pi df}{c} \right) \\ &= 20 \log_{10}(d) + 20 \log_{10}(f) + 20 \log_{10} \left( \frac{4\pi}{c} \right) \\ &= 20 \log_{10}(d) + 20 \log_{10}(f) - 147.55, \end{aligned}$$

where:

( **d** ) is the distance between the transmitter and receiver in kilometers.

( **f** ) is the frequency of the signal in megahertz.

### 2. Diente de Sierra (Sawtooth Pattern):

In signal processing and image processing, a sawtooth pattern refers to a waveform that rises and falls in a jagged manner, resembling the teeth of a saw.

This pattern can be observed in various phenomena, including the modulation of signals, digital-to-analog conversion, and certain types of interference or noise.

### 3. Shadowing:

Shadowing, also known as signal attenuation or signal blockage, occurs when a signal is obstructed by physical objects such as buildings, mountains, or trees.

The obstruction causes the signal to weaken or even be completely blocked, leading to reduced signal strength or loss of signal.

Shadowing is a common issue in wireless communication systems and can be mitigated using techniques like antenna diversity, signal repeaters, and site planning.



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Multi

EdgeUno  
Bogotá  
Change Server

ETB  
186.31.118.160

HOW DOES THE CUSTOMER SERVICE OF ETB  
COMPARE WITH YOUR EXPECTATIONS?

1 2 3 4 5  
Much worse As expected Much better

Aplicaciones móviles para Speedtest

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