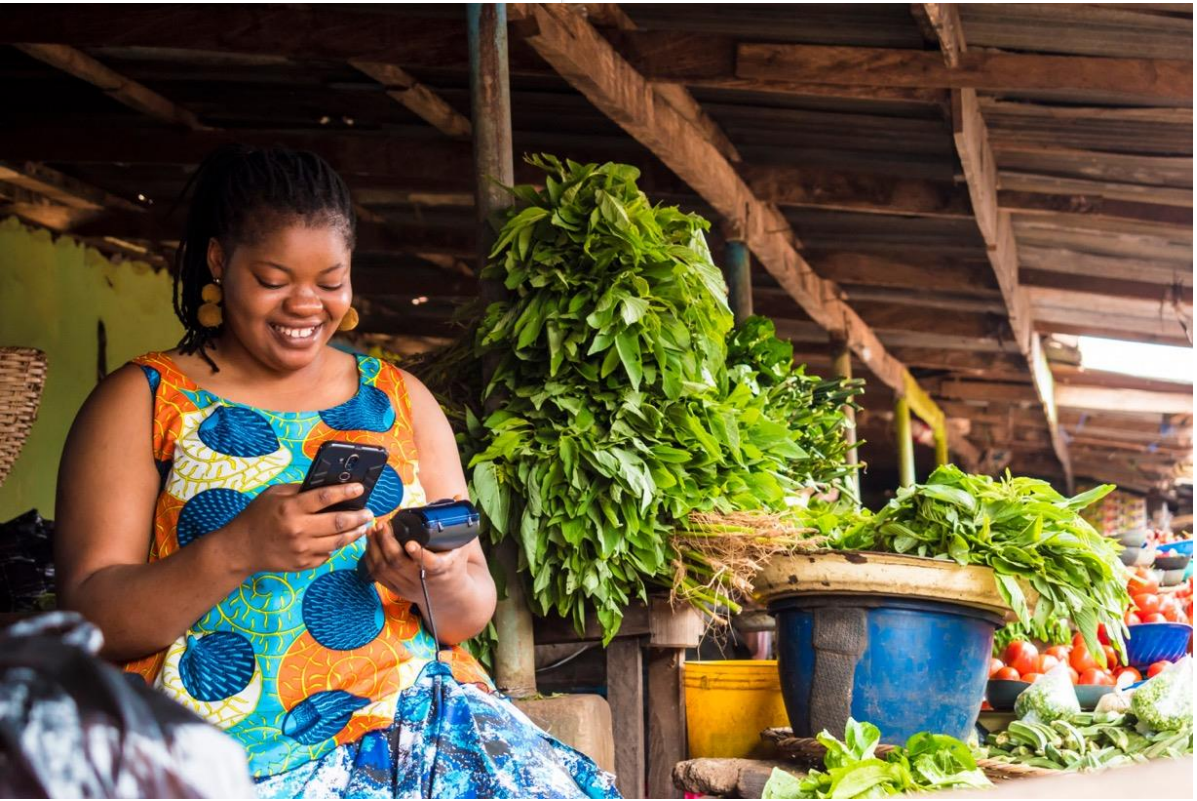

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Connecting networks, businesses and people ...

Dealer Training

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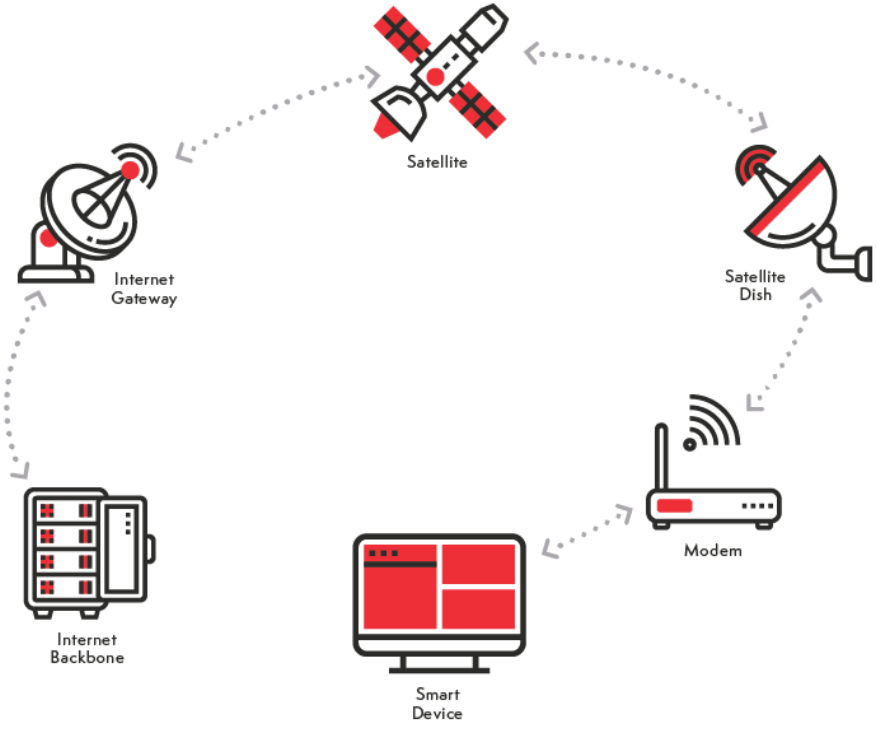
SATELLITE CONNECTION & WEATHER

Satellite connection – how it works?

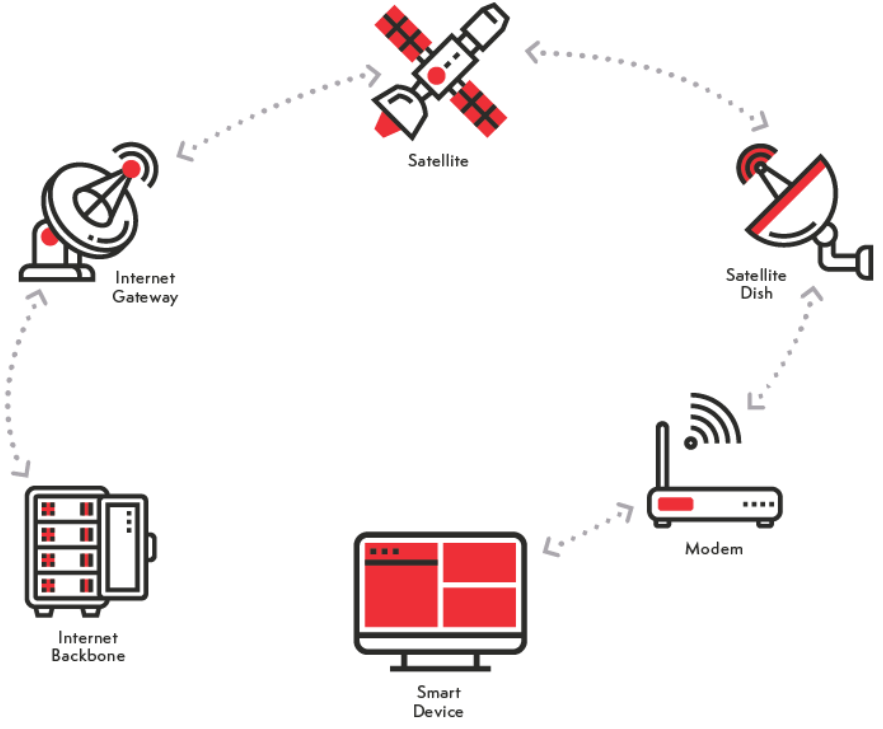


Our satellite internet solution works as follows …

- When accessing the internet and entering a site, a signal is sent to the satellite through the modem and antenna installed in the home.
- Upon receiving this signal, the satellite transmits the signal to the internet gateway. The gateway provides access to the internet.

Satellite connection – how it works?

- The internet Gateway establishes the connection and returns the signal to the computer, displaying the site information requested from the satellite.



The effects of weather

- Let's take a look at how rain, sun and frequency bands could affect the operations of Satellite.

- The service is designed to cope with most weather conditions, including wind speeds of up to 160kph.

- During periods of extremely heavy rain or snow, the radio signals may become reduced but mechanisms are in place to mitigate this.

What is rain fade?

- Rain Fade is the physical phenomenon that deteriorates RF signals due to the presence of moisture (rain, snow, ice) in the transmission path.

- Rain fade can be caused by precipitation at the uplink or downlink location.

- However, it does not need to be raining at a location for it to be affected by rain fade, as the signal may pass through precipitation many kilometres away.

- Signal loss can occur due to presence of water or ice on the antenna assembly.

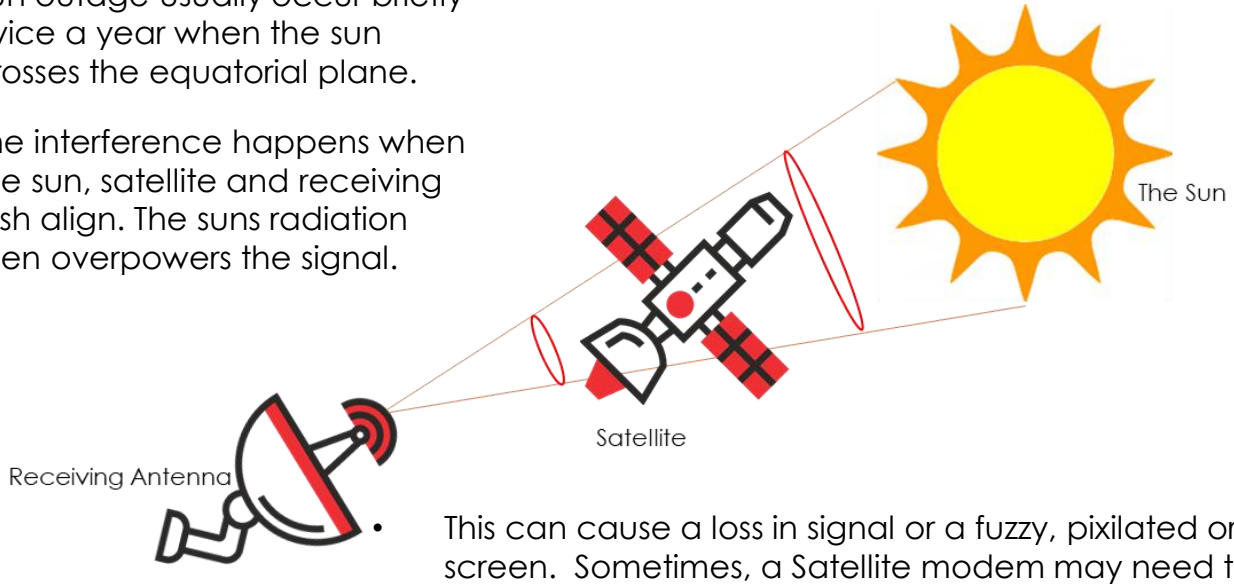
Rain fade cont.

- The HN system (which is a carrier-grade hub system from Hughes, optimised to support medium to large scale satellite broadband networks) has sophisticated, automatic mechanisms built in, to effectively increase the power of your system and compensate for any reduction of the signal by using Adaptive Coding Modulation (ACM). ACM enables the system to automatically react to the effects of rain fade.

- This gives the satellite network higher reliability in adverse weather and limits the noticeable effect.

Sun outage

- Sun outage usually occur briefly twice a year when the sun crosses the equatorial plane.
- The interference happens when the sun, satellite and receiving dish align. The suns radiation then overpowers the signal.



- This can cause a loss in signal or a fuzzy, pixilated or frozen quality on a screen. Sometimes, a Satellite modem may need to be rebooted after the outage to restore services.
- The effect sweeps from north to south from approximately 20 February to 20 April, and from south to north from approximately 20 August to 20 October.
- It affects all satellites and cable providers and their customers but the good news is that it the effects are for less than 12 minutes a day for a few consecutive days.

Satellite beam coverage

- Satellite signals are beamed down to earth and cover an area which is called the satellite footprint.

- The site of the area is determined by the size of the Satellite dish, because when signals of typical frequency are sent to earth the Satellite produces a diffraction pattern (a spread of waves) and the angle of the spread determines the area of the footprint.

Ku-Band frequency

- Ku-Band, or single beam footprint, has shorter wavelengths and a lower frequency to the Ka-Band.
- Ku-Band has been a popular choice for direct broadcasting.

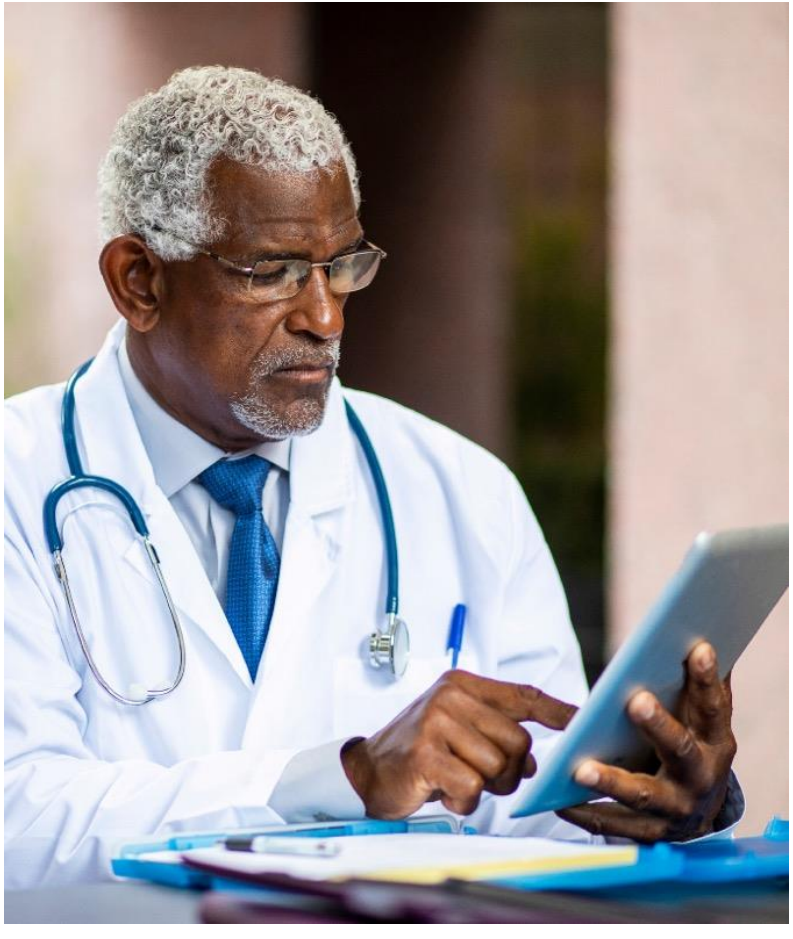
Ka-Band frequency

- Ka-Band is the very latest in satellite technology.
- Ka-Band makes use of “spot beams” rather than broadcasting over an entire continent.
- A spot beam is a satellite signal that is especially concentrated in power and sent by a high gain antenna so that it will cover a limited geographical area on earth.
- Ku technologies has frequencies in the 12 to 18 GHz range, while Ka-Band uses frequencies in the 26.5 to 40 GHz range.
- This higher frequency means that it is possible to get more bandwidth, which means a higher data transfer rate and, therefore, higher performance and speed.
- That is why we use it to deliver affordable, dependable, high-performance satellite solutions to our customers!

Global Ka-band coverage

- YahClick's global coverage - Ka-band - serves more than 1 billion people
- Covering more than 95% of Brazil's population – it also covers more than 60% of Africa's population.

Our coverage across Africa …



- Yahsat provides 28 African markets with Ka-Band coverage, reaching over 60% of the population.

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The End