An introduction to

Volant Connectivity Solutions

Redefining Internet Connectivity

Key Features & Benefits

Channel Bonding
Combines multiple channels to maximise internet speed and reliability

Low Latency
Ensures real-time responsiveness across extensive networks

Highly Secure
Advanced security protocols protect against emerging cyber threats

Hpt Failover
Seamless connection continuity, even if one link fails

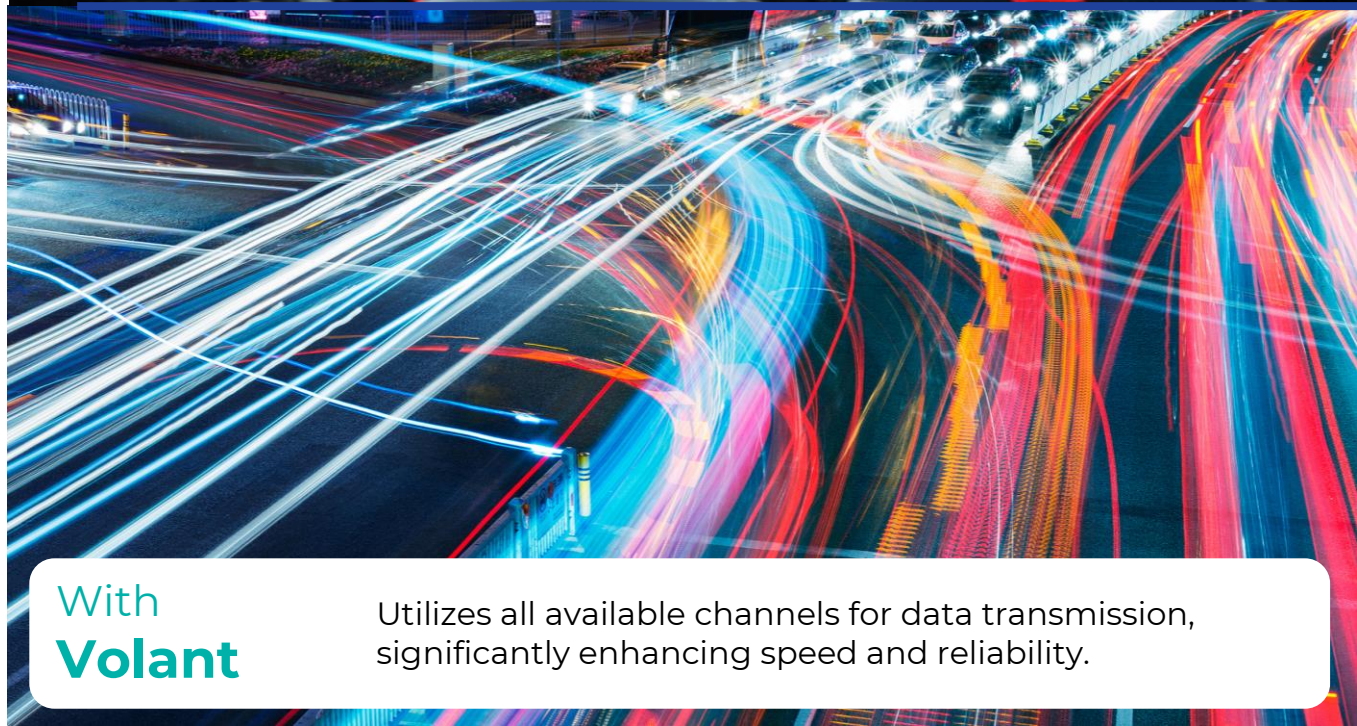
Volant outperforms major competitors in key features like channel bonding and overhead factor!

Successfully passed the OWASP Top 10 penetration tests, ensuring top-notch security across multiple critical areas
Reference : https://owasp.org/www-project-top-ten/

Ready to experience unmatched connectivity?
Contact us to see Volant in action and discuss how we can tailor our solutions to meet your needs, today!

Without **Volant**

The traditional way, a single channel use leads to suboptimal performance, network congestion, and elevated latency.



With **Volant**

Utilizes all available channels for data transmission, significantly enhancing speed and reliability.

Introducing Volant

Your Gateway to Unparalleled Internet Access

Meet **Volant** (Virtual Fibre-Optic Long-Haul Asynchronous Network Technology), the **award-winning technology** at the **Malaysia Technology Excellence Award 2024**. A testament to our commitment to bridging digital divides and enhancing connectivity across diverse landscapes.

What sets Volant apart?

- **High Bandwidth & Channel Bonding**
- **Low Latency**
- **Improved Reliability**

Our achievements

80KM
distance of 200 Mbps internet

3,811 users
connected for 4-day event

30K sqm
covered with reliable internet access

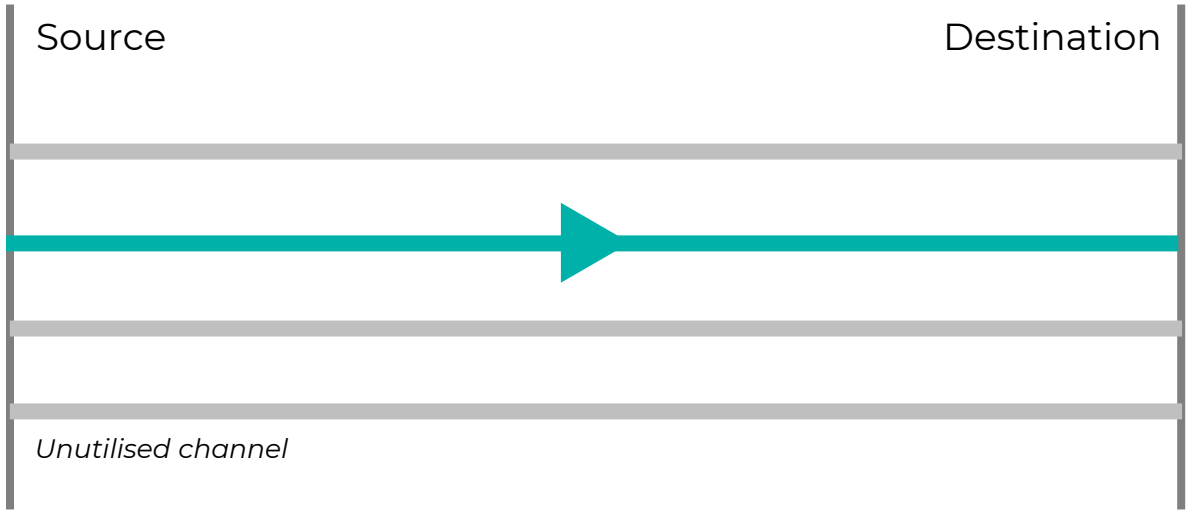
Accolades

MALAYSIA TECHNOLOGY EXCELLENCE AWARDS

Technology - Connectivity

Understanding Volant

How Does Volant Work?

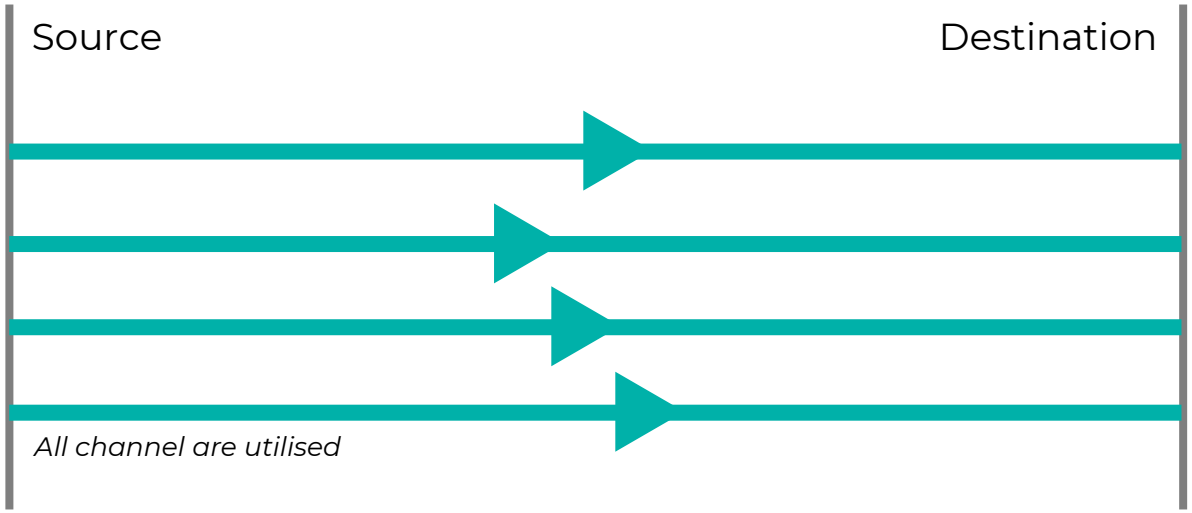


In a typical internet setup without Volant, data packet transmission is often suboptimal and sluggish. This is due to the reliance on a single, fastest channel for data transfer, which can lead to several issues.

Limited Bandwidth
The available bandwidth may be insufficient, resulting in slower data speeds.

Network Congestion
The overburdened channel can become congested, leading to slower connectivity and delays in data transmission.

Elevated Latency
The time it takes for a data packet to travel between its source and destination is increased, causing noticeable lag and reduced responsiveness.



With Volant, the approach to internet connectivity is vastly improved by its ability to leverage multiple available channels. Data is intelligently segmented into smaller packets and concurrently transmitted over various paths.

High Bandwidth & Channel Bonding
By bonding multiple channels, Volant significantly increases the network bandwidth, providing greater data throughput.

Low Latency
The efficient distribution of data packets across multiple channels reduces overall travel time, resulting in lower latency.

Improved Reliability
The use of multiple paths ensures consistent connectivity, even if one path encounters issues, thereby increasing the network's reliability.

Volant Features

Key Features and Benefits of Volant

Hot Failover

Volant enables authenticated and video conferencing sessions to continue even if one channel or link connection is down.

Channel Bonding

Volant uses all channels simultaneously despite the bandwidth or speed. Volant will still use the slowest channel to transmit packet data concurrently.

Highest Bandwidth Bonding

Volant has the lowest Overhead factor in the market with a factor of less than 10% of network round trip transmission.

Single Hardware Deployment

Volant does not require any equipment pairing and the feature happens in any WAN architecture; it all starts from a single router deployment.

Highly Secure

An extremely secured WAN link by breaking down the packet data and transport the packet through different transport channels. This makes Volant technology virtually impervious to man-in-the-middle attacks.

Volant Features Against Competitors

Competitor Analysis

	Brand A	Brand B	Brand C	VOLANT
Feature / Solution Name	**Brand A's solution**	**Brand B's solution**	**Brand C's solution**	**VOLANT**
Channel Bonding	✓	✓	✓	✓
Hot Failover	✓	✓	✓	✓
Multiple WAN Connection	✓	✓	✗ Only LTE	✓
Single Hardware Deployment	✗	✓	✓	✓
Overhead Factor	< 19%	< 20%	N/A	< 10%
Symmetrical Uplink/Downlink Packet Slicing	✗	✗	✗	✓
Does not require a controller	✗ Require a controller to stich back the packet data	✓	✓	✓

Volant Product Specification

Tailored Products to Meet Your Business Needs




Specification / Model	hAP ax³	RB5009UPr+S+IN	CCR2116-12G-4S+	CCR2216-1G-12XS-2XQ
Use case/s	- Small to medium enterprises and residential setups - Supports channel bonding from ethernet, satellite, 5G, and 4G connections - Can be deployed as an access point (150 metre radius)	- Designed for small and medium businesses requiring high-speed internet - Facilitates seamless integration with fibre-optic networks - For data-intensive operations such as cloud computing and large-scale video conferencing.	- Perfect for enterprise-level applications, this model offers advanced routing and network management capabilities - Built to handle heavy traffic loads and complex routing scenarios - Suitable for large corporations and data centers.	- For environments requiring substantial data throughput for channel bonding, such as ISP backbones, large educational campuses, and research facilities - Ensure consistent and reliable high-capacity connectivity.
MikroTik product webpage	https://mikrotik.com/product/hap_ax3	MikroTik Routers and Wireless - Products: RB5009UPr+S+IN	MikroTik Routers and Wireless - Products: CCR2116-12G-4S+	MikroTik Routers and Wireless - Products: CCR2216-1G-12XS-2XQ
Channel bonding maximum bandwidth (Gbps)	1	2	20	100

A product by

MIKROTIK

Volant Channel Bonding

Enabling reliable, high-speed bandwidth connectivity across various inputs

Internet inputs

STARLINK

Satellite (LEO)

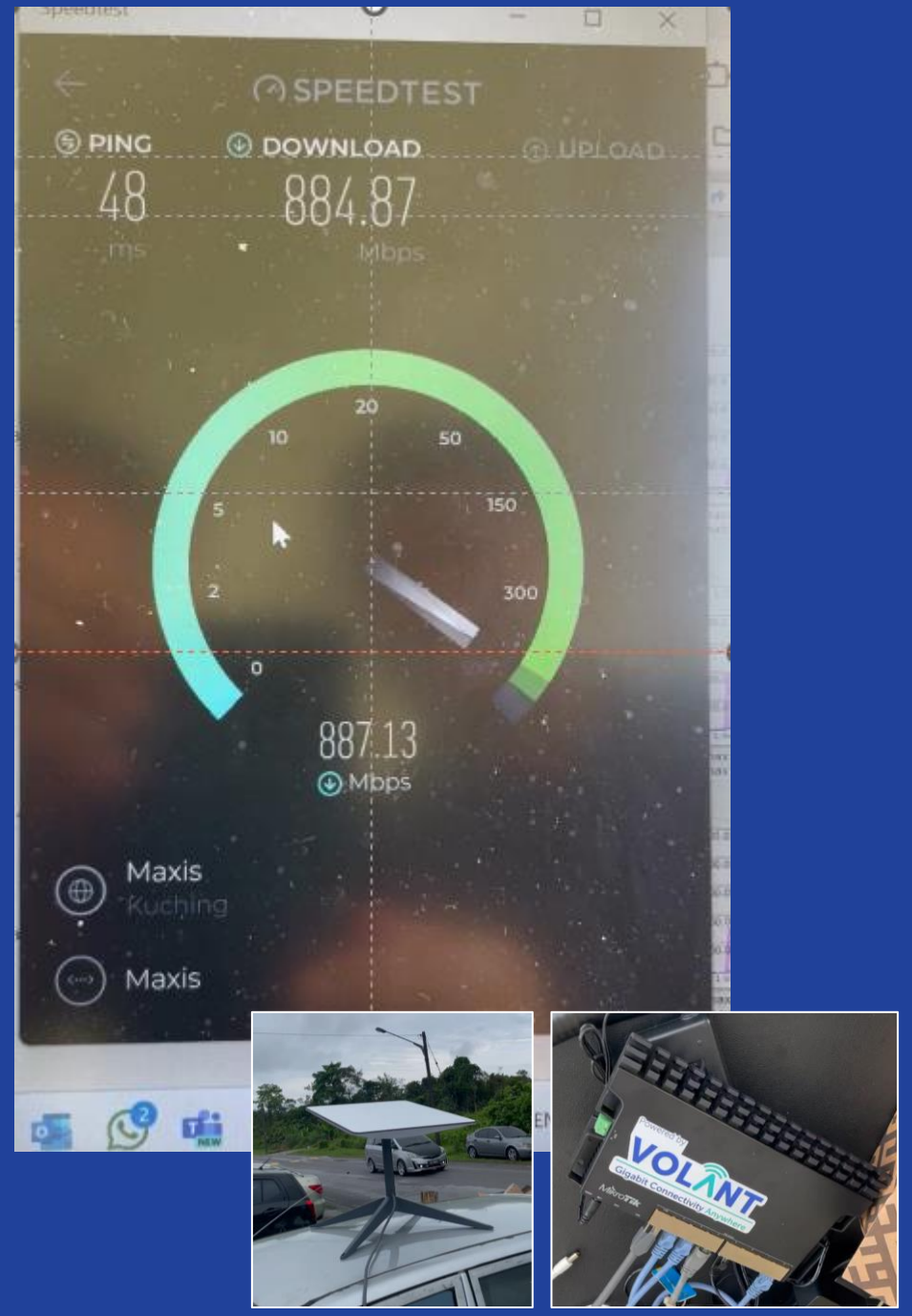
maxis

5G + Broadband

celcom

5G

VOLANT



Ensuring Unmatched Security
Overview of security testing conducted

At Volant, we prioritise the security of our solutions. To demonstrate our commitment, we conducted a comprehensive security assessment on Volant based on the globally recognised **OWASP Top 10** standards.

The OWASP Top 10 represents the most critical security risks to web applications. Testing against these standards helps us ensure that our product, Volant, meets rigorous security benchmarks.

The test covers the following critical security areas:-
1. Ports & Services Disclosure
2. Default Authentication Methods
3. Misconfiguration
4. Deprecated Firmware/Software
5. Common Vulnerabilities
6. Information Disclosure
7. Weak Authentication
8. Privilege Escalation

References
https://owasp.org/www-project-top-ten/

Proven Security Excellence

Test results and implications

We are proud to announce that Volant has **successfully passed** the OWASP Top 10 penetration tests with **'Not Vulnerable'** results across critical security areas.

Critical Security Area	Verified	High	Medium	Low
Ports & Services Disclosure *Exposure of network and service-related information to unauthorised users*	Not Vulnerable	-	-	-
Default Authentication Methods *The use of factory default credentials*	Not Vulnerable	-	-	-
Misconfiguration *Security settings are not defined, are left default, are incorrectly configured, or are incomplete*	Not Vulnerable	-	-	-
Deprecated Firmware/Software *Using outdated and unsupported software or firmware*	Not Vulnerable	-	-	-
Common Vulnerabilities *Known weaknesses within software that are often easy to exploit*	Not Vulnerable	-	-	-
Information Disclosure *Unintended exposure of sensitive information to unauthorized parties*	Not Vulnerable	-	-	-
Weak Authentication *Insufficient security measures in the authentication process*	Not Vulnerable	-	-	-
Privilege Escalation *Process by which a user gains elevated access to resources that are normally protected*	Not Vulnerable	-	-	-

Opting for Volant not only means choosing a **secure, robust, and reliable** technology solution but also partnering in proactive defense against cyber threats. We're committed to transparency and encourage our clients to conduct their own security assessments to verify our systems' integrity.

References

https://owasp.org/www-project-top-ten/

Success Stories

Long-haul Gigabit deployment at 80.7 KM (open sea 71KM)
Connecting high-speed internet over the sea with DMR

Deployment of two network hops

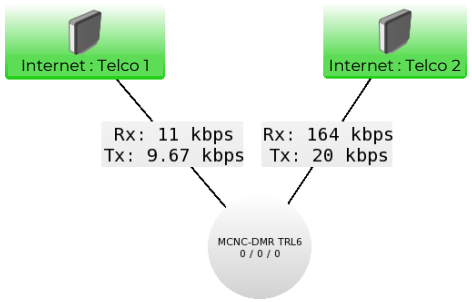
1. Network hop 1 – Offshore : Gunung Raya, Langkawi to Sungai Yan, Kedah (VF 4-Channel DMR) : 80.69 KM (Long Haul)
2. Network hop 2 – Internet : Gunung Raya, Langkawi (VF 2-channel Telco 1 and Telco 2) (Last Mile)

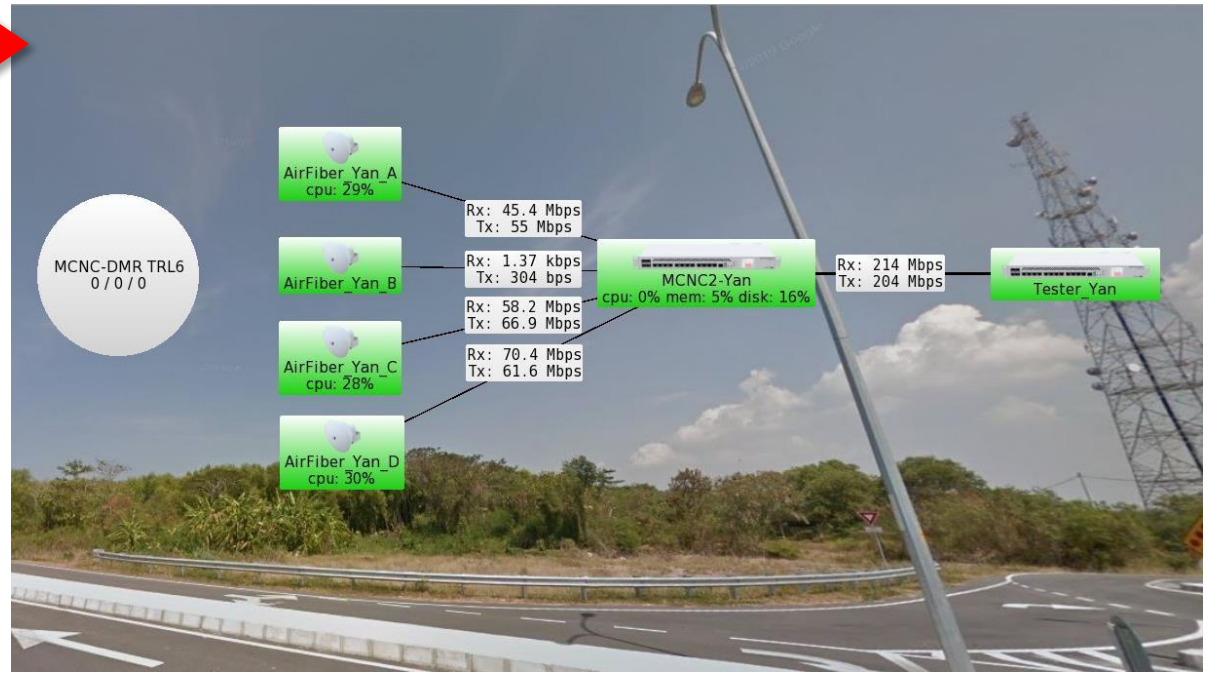
Communication range : 80.7 KM

Last Mile 1:
Gunung Raya, Langkawi

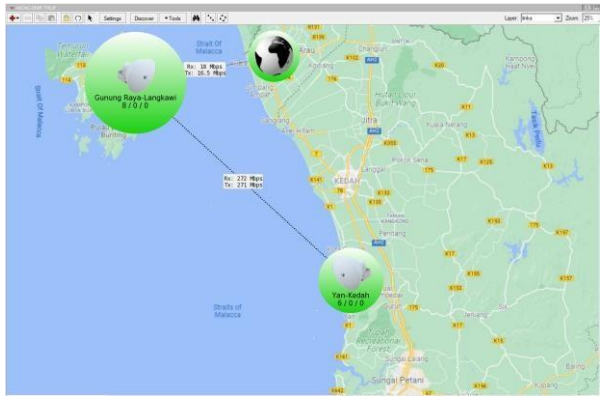
Digital Microwave Radio (80.7km)

Last Mile 2:
Sungai Yan, Kedah

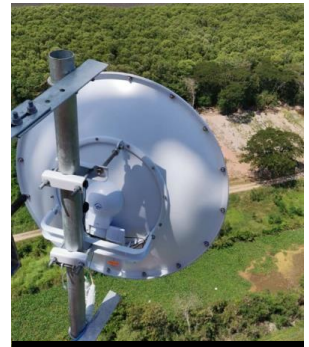




Remote Operation Control via VPN



Indoor Unit (IDU)



4+0 ODU
(3ft-antenna)

Volant x Offshore Deployment

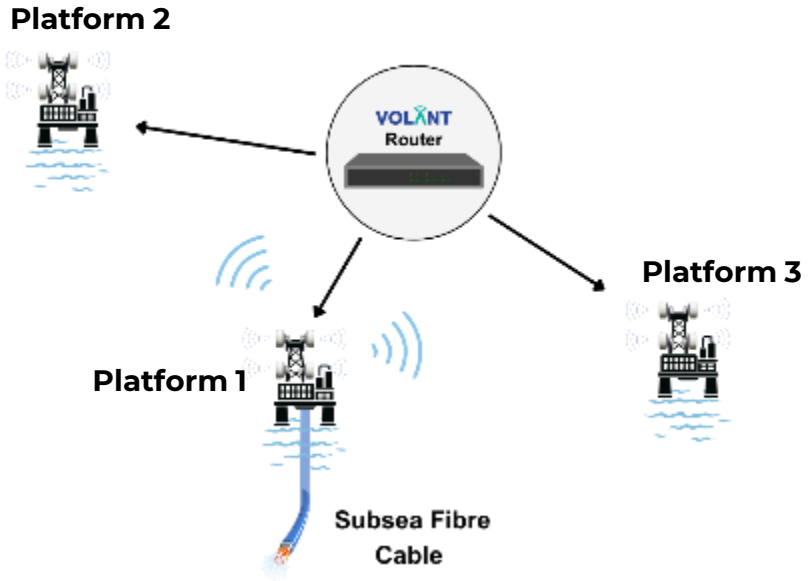
Success Story at Offshore Connectivity

Customer pain points

- Unreliable communication with offshore facilities
- No back-up available for connectivity
- Insufficient bandwidth to deploy data analytics and teleconferencing
- Existing VSAT connection is costly (and slow)

Our solution?

Volant was deployed to transmit a fibre-optic-like internet connection to offshore platforms via long range Digital Microwave Radios (DMRs).



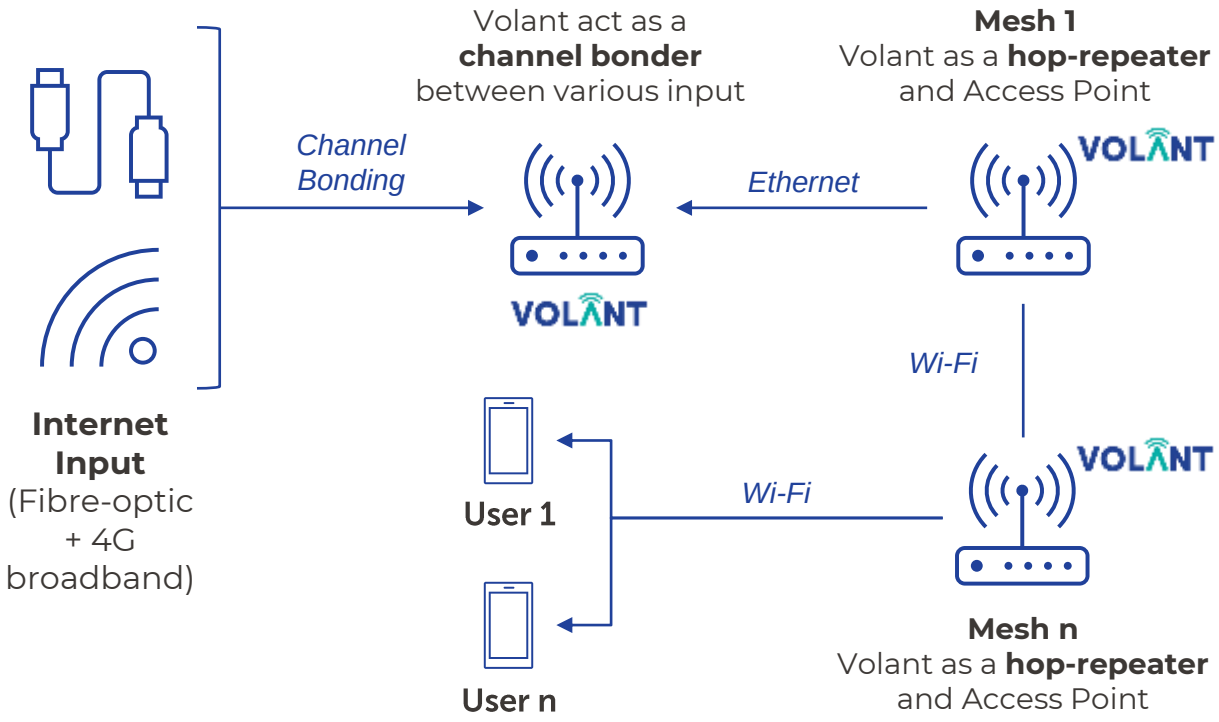
The result?
Connection speed is now at 300 Mbps, improved from 10 Mbps with minimal latency, and increased reliability.

Volant's proven high speed connection at distance >80KM will reach remote locations and wider networks

Volant x University Deployment

Deployment in connecting visitors

Tested and proven on offshore platforms, we have also tested Volant to provide reliable internet connectivity to visitors during large event, utilising Volant's channel bonding technology and mesh network.



Volant x University Deployment

Enabling reliable, internet connectivity for university's convocation ceremony

Convocation Festival
Volant mesh networks can cover 150-metre radius per node

Our achievements

Reliable speed
consistently achieved

3,811 users
connected for 4 days event

263 users
supported at one time

Case study

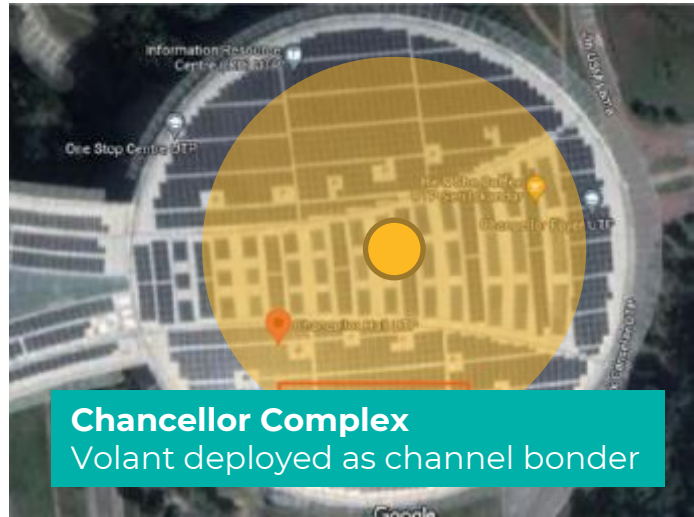
Problem : High user demand causing connectivity issues.
Solution : Deployment of Volant's mesh network.
Results : Reliable speed, high user connectivity, seamless live broadcasts with zero dead-zones.

Testimonials

"In an environment with a vast number of users, the challenge is always about ensuring **consistent internet connectivity**. Volant has risen to that challenge and surpassed our expectations."
University Focal

"The campus Wi-Fi has always been a battle against congestion. Yet, with Volant, we **seamlessly** accessed the live broadcast from inside the Chancellor Hall"
University Student

"My graduation is a once-in-a-lifetime event, and I yearned to **share every moment with my loved ones on social media**. Thanks to Volant's Wifi, I could do just that, immortalizing my proudest moments."
University Graduate



Chancellor Complex
Volant deployed as channel bonder

Frequently Asked Questions (FAQ)

Volant Frequently Asked Questions (General)

1. What is Volant?
Volant is an advanced connectivity technology that employs a unique algorithm to combine different network links, delivering gigabit speeds with minimal latency. Unlike other solutions, which relies on a single internet source, Volant optimises multiple connections to provide consistent and fast internet access.

2. Can Volant guarantee reliable internet in extremely remote areas and what is the distance? Can it be extended?
Absolutely. Volant is engineered to extend high-speed connectivity up to 80 kilometres, ensuring even the most isolated terrains are covered. Yes, it can be extended by using ‘hops’ or links to increase the range.

3. How does the versatile channel bonding feature of Volant benefit my business?
Channel bonding allows Volant to merge various internet sources, such as fibre-optic, broadband, and satellite, to ensure optimal bandwidth utilisation. This means your business can maintain high-speed internet regardless of individual network fluctuations.

4. Will bad weather affect Volant's internet delivery?
Volant is robust by design, with the capability to maintain high-performance levels even in adverse weather conditions. The technology accounts for such variables, ensuring consistent service.

5. Is the installation of Volant a complex process?
On the contrary, Volant is designed for ease of installation. It requires just a single hardware deployment without the need for paired devices or an intricate setup, which makes integrating Volant into your existing network straightforward.

6. What security measures does Volant implement?
Volant provides enhanced security by splitting data packets and transmitting them across various channels, significantly reducing vulnerability to cyber-attacks, such as man-in-the-middle threats.

7. What are the minimum hardware requirements?
The minimum hardware requirements are a minimum processing speed required is 2x-3x of the target bandwidth speed, depending on the technology of the router.

8. Is there a maximum number of internet connections Volant can bond?
Volant's capability to bond multiple connections is subject to the hardware specifications of the deployed router.

8. Can Volant handle the demands of large-scale events with numerous attendees?
Indeed, Volant's expansive mesh connectivity is ideal for large gatherings, creating a comprehensive network coverage, or a 'digital dome', to keep everyone connected.

9. Does using Volant require any changes to our current network security protocols?
Volant is designed to be complementary to your existing network infrastructure. It works within your current security protocols, not requiring any significant changes, thereby preserving your network's integrity.

10. How does Volant integrate with existing corporate networks, and is it compatible with all network types?
Volant is highly adaptable and designed to seamlessly integrate with a variety of network architectures. It is compatible with all types of internet connections, including fibre-optic, broadband, and satellite, ensuring that regardless of your current setup, Volant can enhance and amplify your connectivity without the need for extensive network modifications.

Volant Frequently Asked Questions (Technical)

1. What does combining network links do?
By programming Volant onto a router, it can be connected and configured seamlessly to any network. It then combines multiple internet connections into a single logical channel for increased capacity and redundancy. For example, by subscribing to a 1 GB fibre connection and a 1 GB cable connection, Volant can combine them seamlessly to give your organization 2 GB of available bandwidth.

2. What if I don’t have access to gigabit internet subscriptions in my area, do I benefit from using Volant?
Yes you can. Let’s say you’re in a remote or rural area where bandwidth is scare and cellular coverage is weak. In this case, Volant’s integrated solution can be used to transport high speed connections to your location via a series of digital microwave radios, each of which can carry the signal up to 80 km away to the next radio or to your location.

3. Does Volant require backhaul to the Internet?
No, however the primary purpose of Volant is to provide smooth and reliable internet to the end user. If there is no internet backhaul connection, then it will act as a private network.

4. Can Volant connect to any type of network connection such as fibre, satellite or microwave?
Yes, Volant can be used with any internet connection. It can combine up to three (3) sources of internet links to give you a combined gigabit speed connection. Volant can therefore be a cost-effective solution for increasing bandwidth, particularly in scenarios where it is not feasible or cost-effective to install high-bandwidth fixed/fibre.

5. Is there a maximum number of internet connections Volant can bond?
Volant's capability to bond multiple connections is subject to the coverage of the multiple WAN links. For detailed specifications, our team is ready to provide tailored advice based on your setup.

6. How does Volant optimize those connections while limiting latency?
Volant optimizes for maximum available bandwidth in two key ways. First, it splits up the data packets being sent from the client into even smaller data packets. This reduces or even eliminates queuing at each hop between the client and the receiver as packets can bypass those protocols, which is a significant source of latency. Secondly, Volant’s algorithm prioritizes using the full bandwidth available from all internet connections, from the lowest to the highest quality connection. It then transmits the data packets concurrently across those channels, which is how Volant achieves it’s low latency connectivity.

7. Does Volant need be at both the client and the receiving end to work?
No, Volant does not need to be a set of paired devices in order function. It’s algorithm intelligently analyzes all available network paths to send the data from the source all the way to the receiver and coordinates the data transmission to arrive in the correct order at the receiver’s side without the need for additional computation.

8. Can Volant guarantee reliable internet in extremely remote areas?
Absolutely. Volant is engineered to extend high-speed connectivity up to 80 kilometers, ensuring even the most isolated terrains are covered. By surpassing the limitations of traditional fibre-optic networks, it provides unparalleled reach.

Volant Frequently Asked Questions (Technical)

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14. Does it require a specific brand of hardware?
We have tested the algorithm across any hardware with open ecosystems for us to program and have also updated monthly with patches to improve performance. Currently, the brand that we have tested extensively is Mikrotik routers.

15. Kindly provide: power consumption details; only one type of Mikrotik box or different; and port/interface details.
It is dependent on the hardware augmented with Volant, as follows:

i. hAPAx3 (up to 950 Mbps speed) : https://mikrotik.com/product/hap_ax3
ii. RB5009UPr+S+IN (up to 2 Gbps speed) : https://mikrotik.com/product/rb5009upr_s_in
iii. CCR2116-12G-4S+ (up to 20 Gbps speed) : https://mikrotik.com/product/ccr2116_12g_4splus
iv. CCR2216-1G-12XS-2XQ (up to 100 Gbps speed) : https://mikrotik.com/product/ccr2216_1g_12xs_2xq

Volant Frequently Asked Questions (Technical)

16. What is the difference between load balancing features and Volant?
Load Balance - When you use apps on your devices, information travels to the internet through network sockets – think of them as pipes. A load balancer works by distributing these sockets across all the Internet connections you are currently using. In this way, load balancing prevents overloading a single connection, thereby increasing overall performance. Load balancing optimizes Internet traffic per socket. Volant, on the other hand, goes one step further and optimizes traffic into even smaller packets. Following the 'pipes' analogy for sockets, we can think of these network packets as the 'liquid' that flows through those pipes. Hence making it possible to spread these individual packets across multiple Internet connections. By splitting all your web traffic at the packet level, even large, single-socket transfers, such as VPN (virtual private networks) connections, video streaming, and file transfers, can be given a major bandwidth boost.

17. MikroTik can also set all channels to primary, how different is it to Volant?
Yes, however the traffic will still only flow through a single channel until that channel is fully utilised, only then will it fall to the 2nd primary channel. Compared to Volant, Volant uses all channels simultaneously without clogging or congesting a single channel.

18. Is there an increase in Digital Microwave Radio (DMR) system gain, because range/hop length can increase only when there is increase in system gain?
There is no increase in DMR system gain. Volant is passive. Volant will use whatever performance of the DMR system can deliver. Volant is an active internet channel bonder. To increase DMR range, without additional power amplifier or big antenna gain, transmission bandwidth can be reduced from max 50MHz (depending on country regulation) to 30MHz to 2MHz. Small transmission bandwidth increases bandwidth transmission power hence increases transmission range. Small transmission bandwidth will result in decreased data speed. Bonding multiple DMR channels can compensate for the decreased data speed to achieve the desirable data speed. The main objective of using lower transmission bandwidth is to extend transmission range. Using multiple DMRs with lower transmission bandwidth bonded together to extend the transmission range and achieve the desirable data speed is the low-cost solution using DMR. Volant is the solution for internet channel bonding.

19. How much is the antenna step down with Volant or without Volant for any Distance Measuring Equipment (DME) link?
Volant is a passive solution and has no control over the DMR link and the antenna. Volant only controls the data flow from and to the DMR. It is recommended that the DMR is configured with the best Signal-to-Noise Ratio (SNR) margin result for transmission stability so that DMR can fully optimise the data transmission performance from the DMR using internet protocol. The antenna step-down with Volant varies depending on the specific deployment scenario. However, with Volant's advanced technology, the system is optimised to provide efficient performance even with potential step-down scenarios, ensuring consistent DME link quality.

Volant Frequently Asked Questions (Technical)

20. Is Volant in compliance with telecom industry standards and interoperability?
Volant is fully compliant with prevalent telecom industry standards. Moreover, it has been designed with interoperability in mind, ensuring seamless integration with existing infrastructure and compatibility with a broad range of devices and platforms.

21. What are Volant's scaling numbers (system capacity, speed and performance thresholds)?
Current Volant technology is capable of bonding unlimited network channels and bonding speed from accumulated network speed up to 100 Gbps.

22. How does Volant improve satellite connectivity?
Volant can use both GEO (Geostationary orbit) Satellites and LEO (Low Earth Orbit) Satellites simultaneously. With this, users can experience excellent connectivity with load shaper technology and channel bonding technology among the different orbital satellite backhauls.

23. Does it work with VSAT (Very Small Aperture Terminal)?
Yes, Volant can use VSAT as the single internet backhaul or can use VSAT as one of the many internet backhauls.

24. I am not using DMR, can Volant still work with my network?
Yes, Volant can still work on other transport platforms for example: cellular base stations / antenna, VSAT, Starlink broadband, submarine cables, fibre-optic and etc.

25. Does using Volant require any changes to our current network security protocols?
Volant is designed to be complementary to your existing network infrastructure. It works within your current security protocols, not requiring any significant changes, thereby preserving your network's integrity.

26. What are Volant's cybersecurity features?
Volant incorporates robust security features such as encryption and secure tunnels to safeguard data transmission and ensure the privacy and integrity of user data. Volant incorporates advanced encryption techniques and a multi-layered security protocol to ensure data integrity and protection against potential cyber threats. Volant provides enhanced security by splitting data packets and transmitting them across various channels, significantly reducing vulnerability to cyber-attacks, such as man-in-the-middle threats.

Volant Frequently Asked Questions (Technical)

27. How secure are the Mikrotik routers with Volant?

Besides Volant is virtually impervious to man-in-the-middle attacks, the devices are also highly secure and has been hardened with the following security enhancement.

i. Blacklist any WAN (Wide Area Network) attacker for 1000 minutes.
ii. Block any LAN (Local Area Network) attacker for 30 minutes if the attacker is using Wifi LAN.
iii. All ports closed. Exception on port 22 (ssh), port 443 (https:), port 53 (dns) and port 8291 (can only access via MAC address). All ports require port knocking.
iv. Alpha-numeric-symbol generated username and password access to webserver and ssh, after successfully port knocked.
v. Port knocking is required for remote device access.
vi. Embedded firewall which blocks all port scanning.
vii. Webserver access using HTTPS, after successful port knocked.

28. What redundancy and failover mechanisms are integrated into Volant?

Volant incorporates automatic failover mechanisms that ensure continuity of service by seamlessly switching between available network paths in case of a connectivity issue.

29. Does Volant offer any Quality of Service (QoS) features to prioritise critical data traffic?

Volant comes equipped with QoS features that allow for the prioritisation of critical data traffic, ensuring that essential services receive priority bandwidth allocation.

Let’s talk

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