



[www.the-toffee-project.org](http://www.the-toffee-project.org)

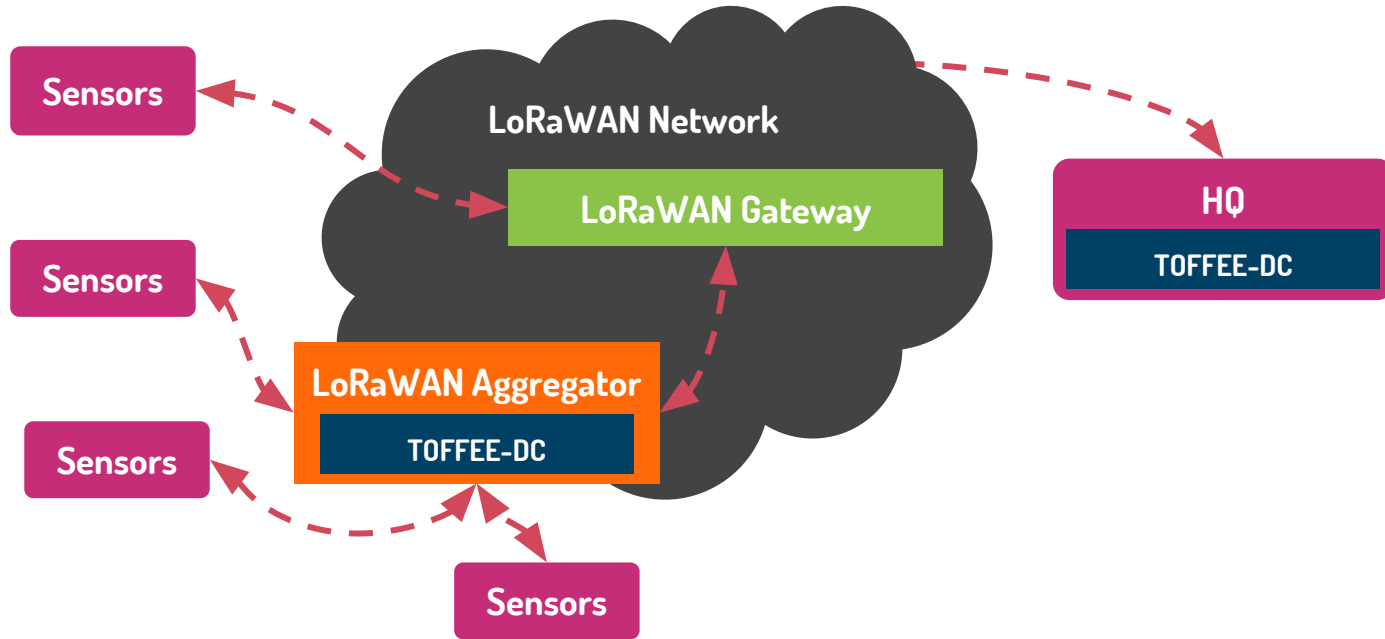
by: Kiran Kankipati

**TOFFEE-DataCenter** is an open-source WAN Optimization (Network Optimization) platform which can be used to optimize your critical networks such as:

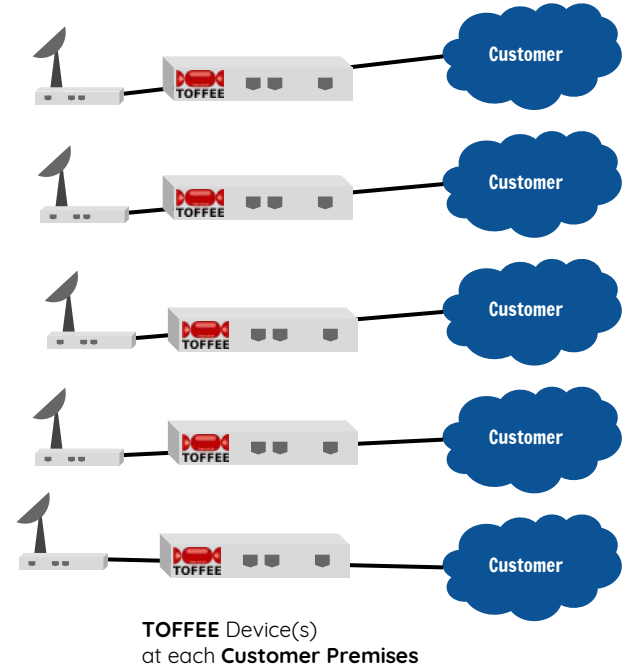
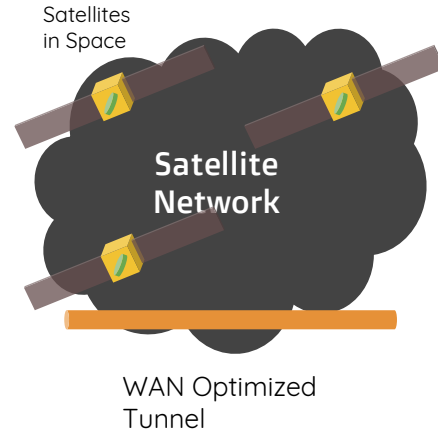
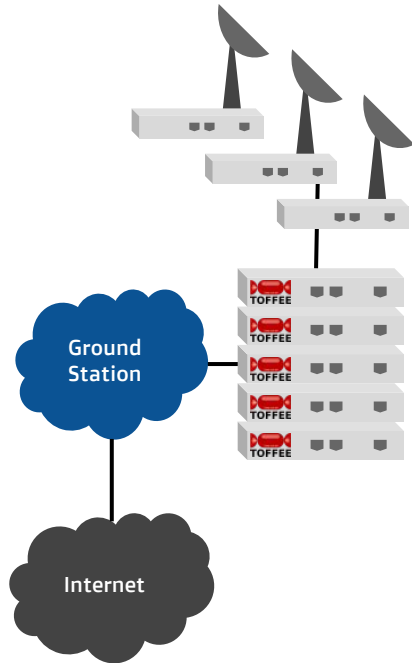
- > Aerospace Communications (In-flight Wifi networks) and Satellite Networks
- > Defense(Military) Communications
- > Marine Internet
- > Big Data Analytics
- > Teleradiology Networks and other Medical communication applications
- > Mobile Networks - 3G/4G Networks
- > Optimized Mobile Wireless Backhaul Networks
- > VoIP Networks
- > Software Defined Networks (SDN) and SD-WAN
- > B.A.T.M.A.N. Wireless Mesh-Networks/Radios - Mobile ad hoc networks (MANETs)
- > LoRaWAN Networks
- > Deep Space Networks (DSN)
- > Internet of Things (IoT) Platform
- > Content Delivery Networks or Content Distribution Networks (CDN)

Some deployment scenarios ...

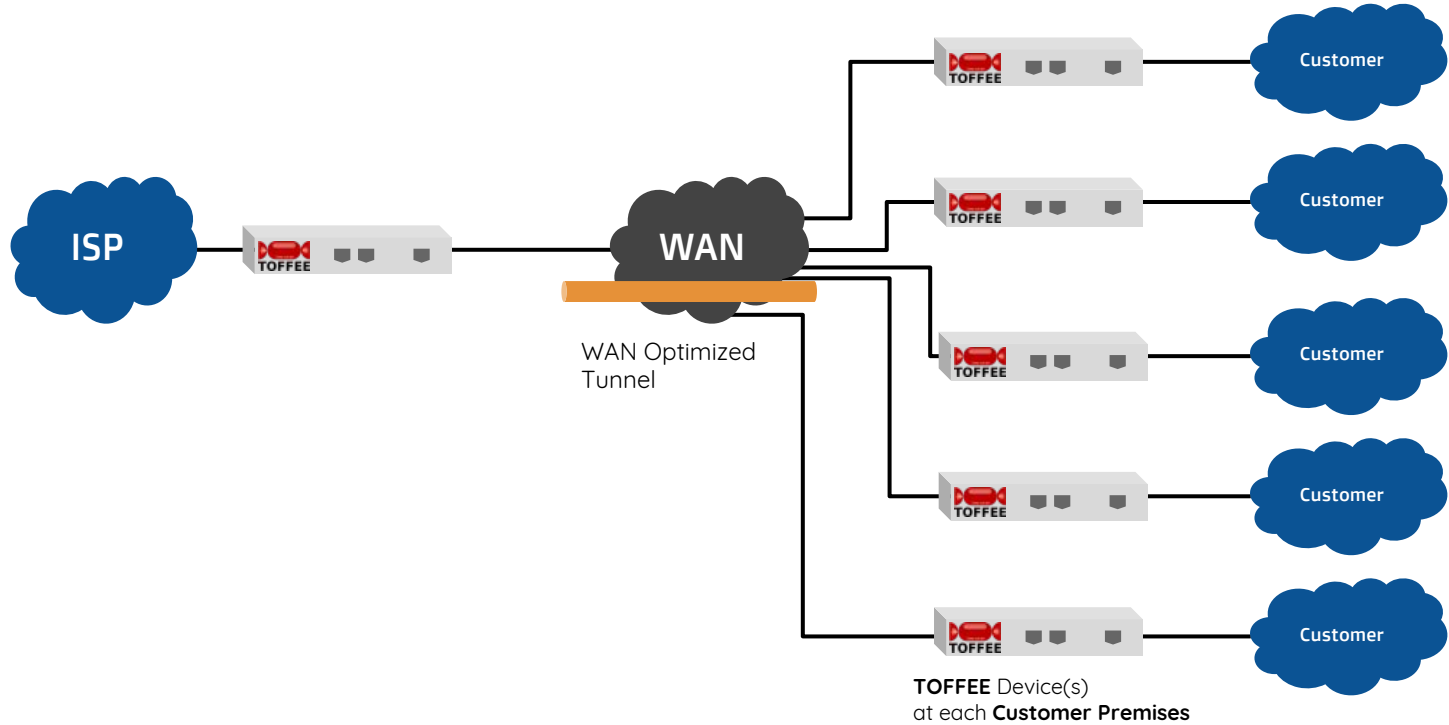
## Increase your LoRaWAN bandwidth



# Satellite Networks

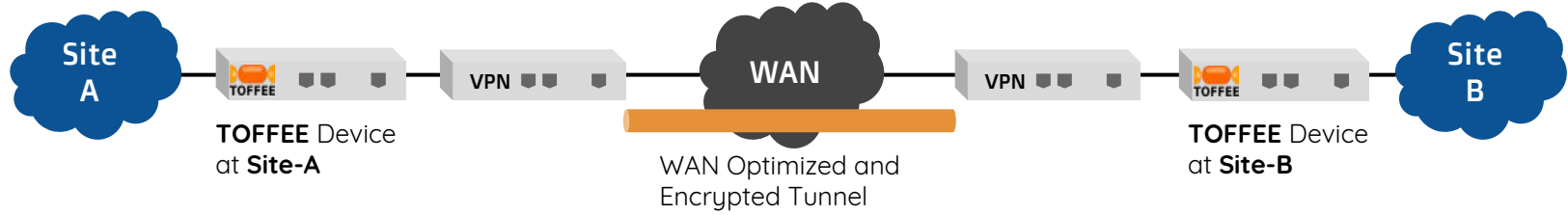


# Large Infrastructure and or ISP Networks

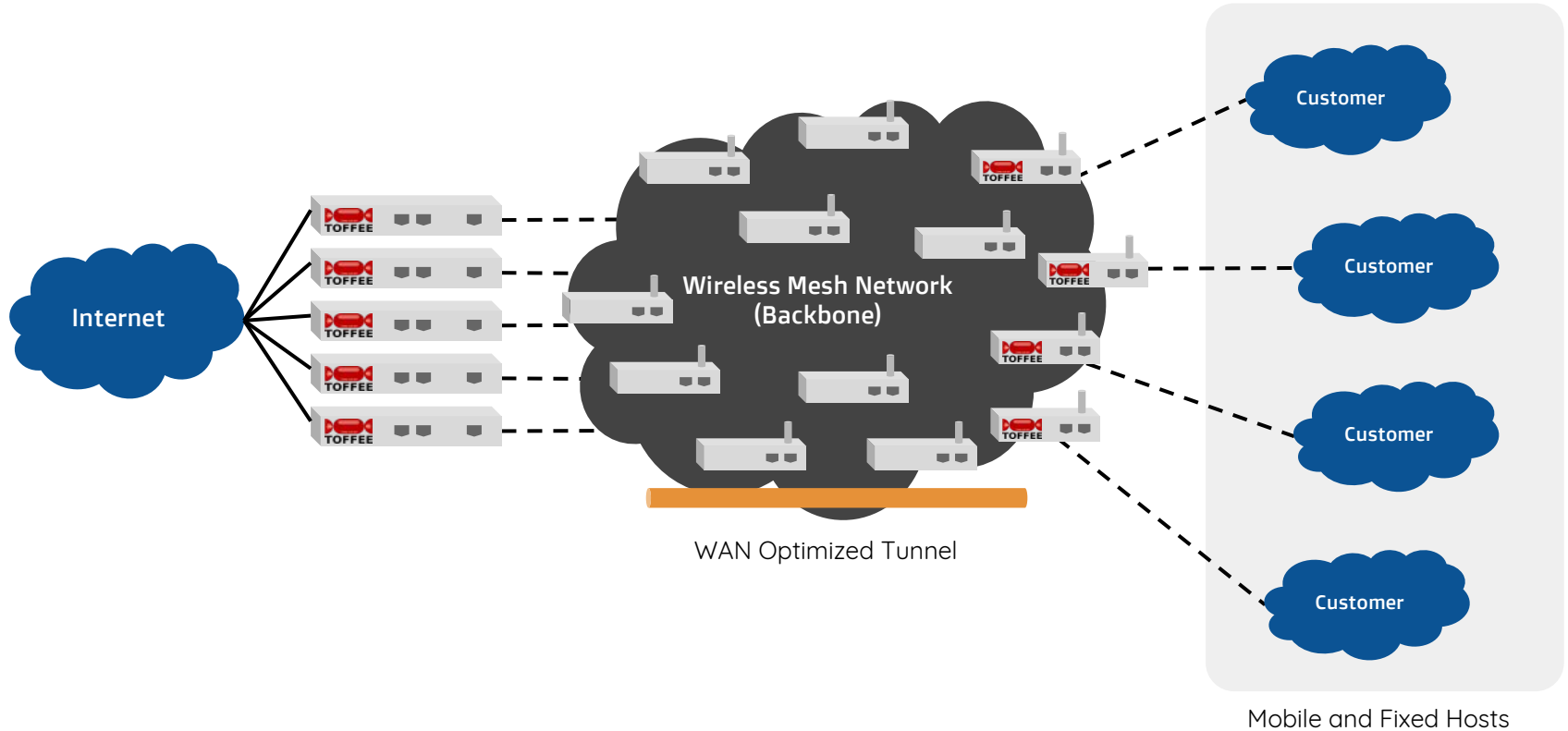




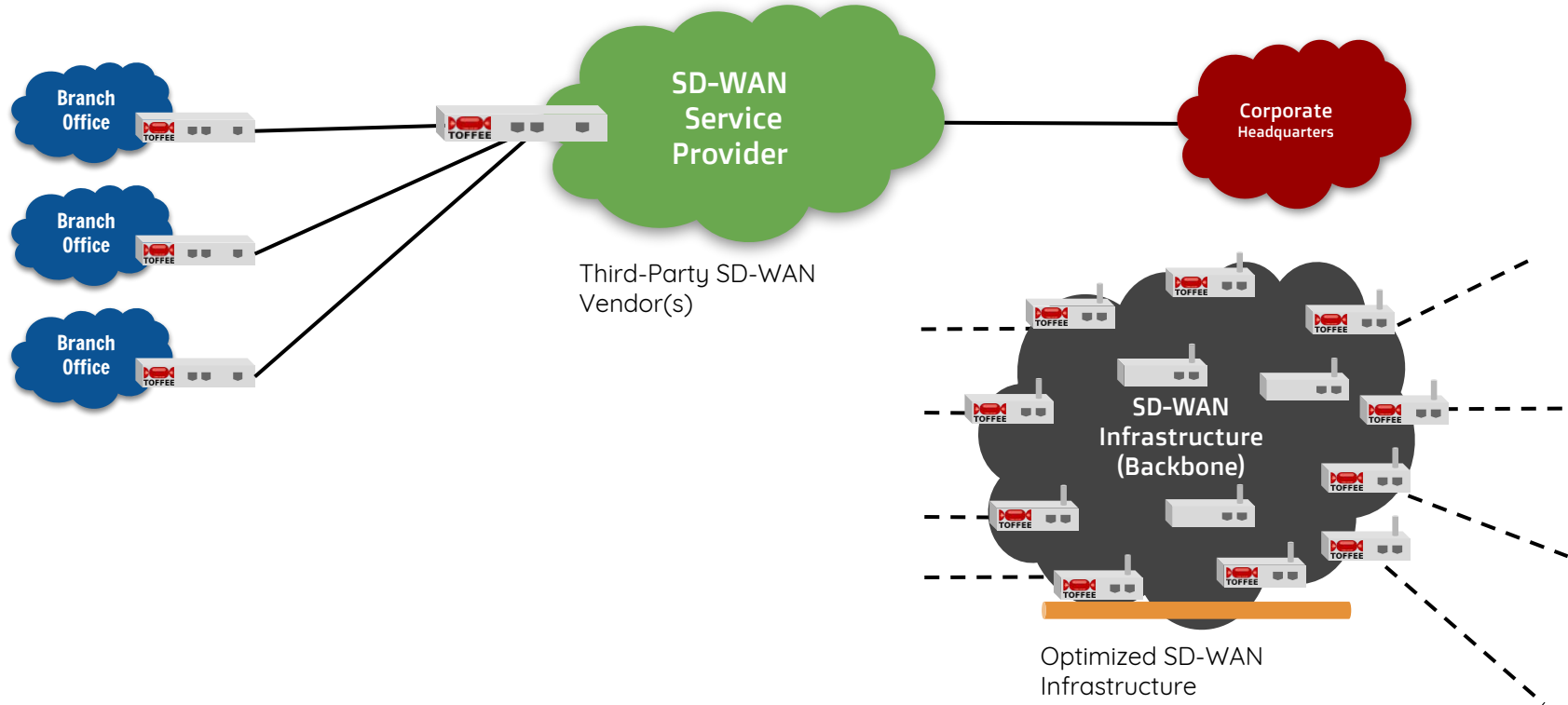
# VPN Traffic Optimization



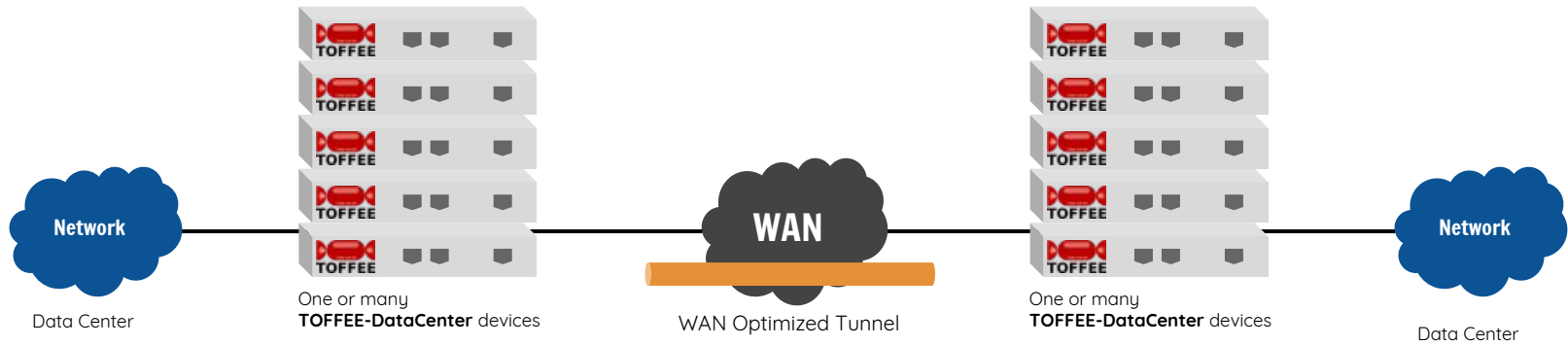
# Wireless Mesh Networks



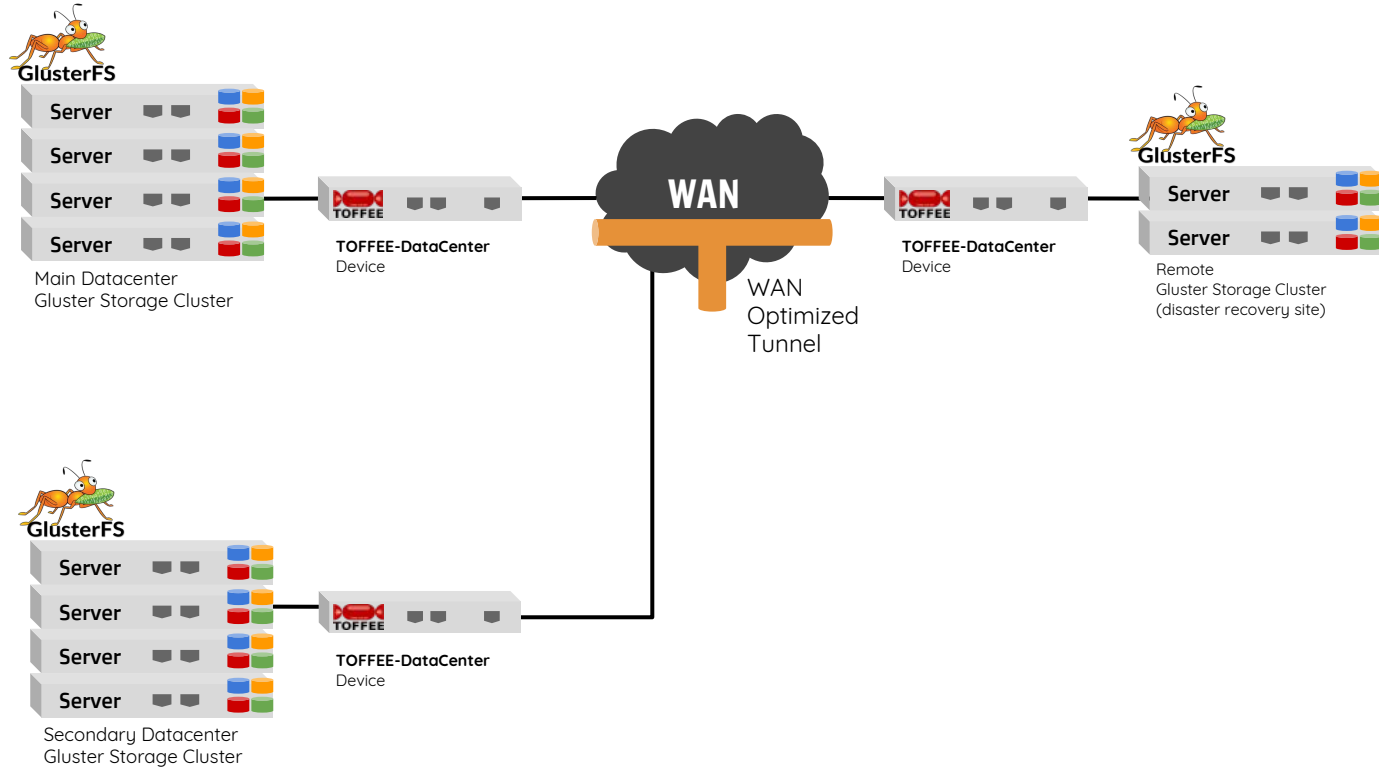
# SD-WAN Infrastructure



## Scalable and modular *(load-sharing/load-balancing architecture)*



# Distributed Storage Cluster Infrastructure (such as CEPH/Gluster ...)



... and in the future long-distance space communication:

- > Long distance IPN (InterPlanet Networks) and other Deep Space Networks (DSN) infrastructure
- > [https://en.wikipedia.org/wiki/Interplanetary\\_Internet](https://en.wikipedia.org/wiki/Interplanetary_Internet) (wiki: Interplanetary Internet)

Challenges are :: for example:

**NASA's New Horizons space probe:**

- > Jupiter flyby Feb-2007, communication rate of 38 kbit/s at Jupiter  
- vs -
- > Pluto flyby Feb-2016, communication rate of 1-2 kbit/s at Pluto

Refer Wiki: [https://en.wikipedia.org/wiki/New\\_Horizons](https://en.wikipedia.org/wiki/New_Horizons)

... and so:

TOFFEE (TOFFEE-DataCenter) is specifically architected to address such unique cases where the network communication is simply limited by underlying physics !

Especially such as:

- > In-flight WiFi

- > Marine Internet

- > on-site/war-zone Defense Networks

- > Interplanetary Internet and Deep Space Networks

- a challenging milestone to accomplish even before we think about terraforming and colonizing other planets !

# Advantages of TOFFEE-DataCenter:

- > unlimited TCP sessions
- > optimizes TCP, UDP, ICMP and SCTP
- > optimizes TCP-Header, UDP-Header (*IP Header is untouched for seamless end-to-end packet routing*)
- > make existing VPNs perform faster: *TOFFEE prevents VPN packet fragmentation which occur commonly due to extra headers and encryption (exceeding MTU)*
- > supports IPv4 and IPv6
- > lossless packet compression
- > packet de-duplication
- > packet packaging/multiplexing
- > application specific optimization: *HTTP, SSL, FTP, Skype, Google-Hangouts, DNS, VNC, TeamViewer, MySQL, CIFS, SIP, RTP/RTCP, SMTP, POP, etc*
- > stateless packet processing
- > extended to support hardware packet processing as well hardware based loss-less compression (*acceleration cards*)
- > optimizes live streaming data (*such as VoIP, Podcasts, Radio, Live TV*), which cannot be optimized via any existing file caching solutions



... and so:

TOFFEE (TOFFEE-DataCenter) is not about optimizing just TCP/UDP data or IPv4/v6 networks, it can work on almost ALL layers (i.e L3, L4 and Application even L2 if required) to address this big-picture !

Thank you !