

Use All-Silicon Backhaul to Ease the Capacity Crunch in Remote Cellsite Wireless Aggregation Hubs

Siklu's EtherHaul™, the World's Most Deployed Millimeter Wave Radio, Delivers Reliable Gigabit Ethernet to Ease the Capacity Crunch in Mobile Backhaul Wireless Hub Sites

Challenge

Mobile operators are seeking a wireless backhaul capacity boost to overloaded wireless aggregation transport hubs. The solution should be scalable, easily deployed with minimal disruptions to operations, while keeping OPEX and CAPEX as low as possible.

Solution

The Siklu EtherHaul™ market leading millimeter-wave radio with cutting edge networking capabilities enables a cost-effective, field-proven and reliable wireless backhaul option. The solution is based on an innovative all-silicon, ultra-compact radio, and operates in the uncongested 70-80 GHz band. Its MEF-compliant capabilities enable smooth integration with any carrier-grade Ethernet network.

Benefits

- Optimal 1 Gigabit backhaul capacity for longer investment protection
- Ultra compact, all outdoor hardware with very low power consumption
- Industry leading >70 years MTBF for reduced OPEX
- Full suite of MEF-compliant services for easy network integration
- Lowest TCO solution operates in lightly licensed, uncongested band

Wireless backhauled aggregation sites require the most frequent capacity upgrades in the mobile network. Operators require Ethernet-based wireless links that can provide a one-time massive capacity enhancement, without the regular frequency-freeing hassles of traditional microwave links. Siklu's innovative all-silicon EtherHaul™ millimeter-wave radios enable full Gigabit throughput in the uncongested 70-80 GHz band and provide carrier-grade relief.

The Challenge

Backhaul networks for mobile services are throttled by constantly increasing data usage. Traditional wireless backhaul systems were not designed for such bandwidths and therefore, mobile operators are seeking alternatives that require less hardware and operate in uncongested frequency bands. Leading operators have already defined the requirements for an optimal wireless solution:

- Deploy without the hassle and service-disruption that accompanies the process of freeing-up frequencies from nearby links.
- Enable successful delivery of legacy services, T1/E1, (to serve EVDO/GSM cellsites) with advanced Sync capabilities.
- Eliminate the need for additional, multi-unit, heavy, power-consuming, traditional MW upgrade kits. The weight and size of the upgrade kits heavily load the cellular towers of typical wireless aggregation sites.
- MEF-based smooth integration of the upgrade solution to an MPLS or L2-based mobile backhaul network.
- Future-proof solution that can deliver Gigabit capacity ('fiber link') with no need for hardware upgrades.

Upgrade Steps for Traditional MW Based Aggregation Site

Figure 1 shows a typical wireless backhaul section of a mobile operator. The blue dotted wireless backhaul link is the first to become heavily loaded due to the emerging data capacities required by today's data centric mobile subscribers.

A typical traditional MW system requires the following for its capacity upgrade:

- Replacing the antenna unit to a dual-feed type (to enable dual polarization)
- Adding an outdoor RF unit
- Adding baseband radio modem card at the indoor unit
- Adding frequencies to main link by freeing up frequencies (if available) from surrounding links

These upgrade actions will typically lead to 400M or 800M of capacity, and require extra space and power in a heavily populated aggregation site's cell tower.

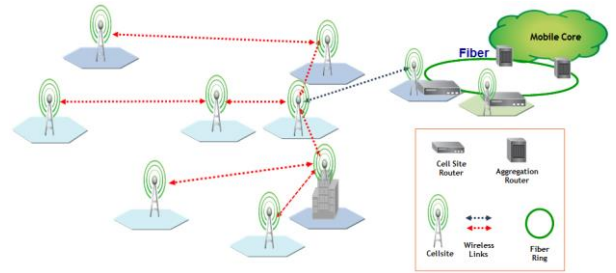


Figure 1: Typical Wireless Branch of Backhaul Network

Remote Cellsite Wireless Aggregation Hubs with EtherHaul™

The optimal solution for Gigabit capacity at remote aggregation sites is Siklu's EtherHaul™ all-silicon radio and optionally, carrier Ethernet network cell site routers. The EtherHaul™ millimeter-wave radio operates in the E-band (70/80 GHz) spectrum providing an opportunity to deploy in this under-utilized frequency band which is lightly licensed in most countries, contributing to lower OPEX.

Mobile backhaul network's operators have already realized the benefits of a heterogeneous carrier Ethernet network delivering both data and TDM. This proposed upgrade extends the carrier Ethernet footprint to the heavily loaded, wirelessly backhauled aggregation sites.

- The optical network Cell Site Router will replace the traditional MW indoor unit, and will deliver TDM services synced (SyncE or 1588v2) over the EtherHaul™ wireless link.
- Siklu's EtherHaul™ integrated radio and antenna all outdoor solution will replace both the antenna and RF units of the traditional MW link.

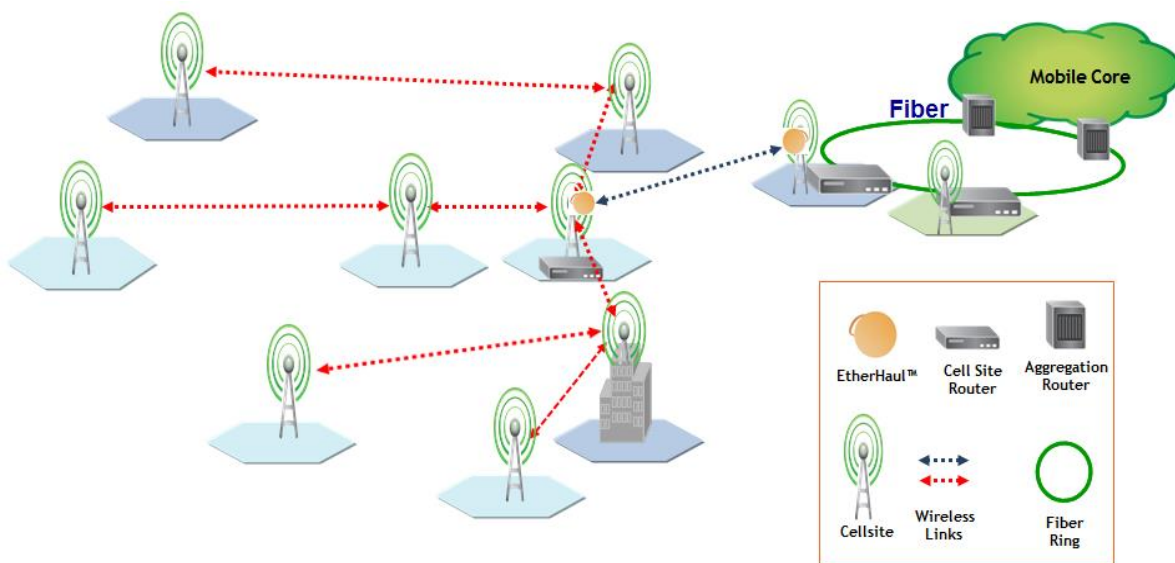
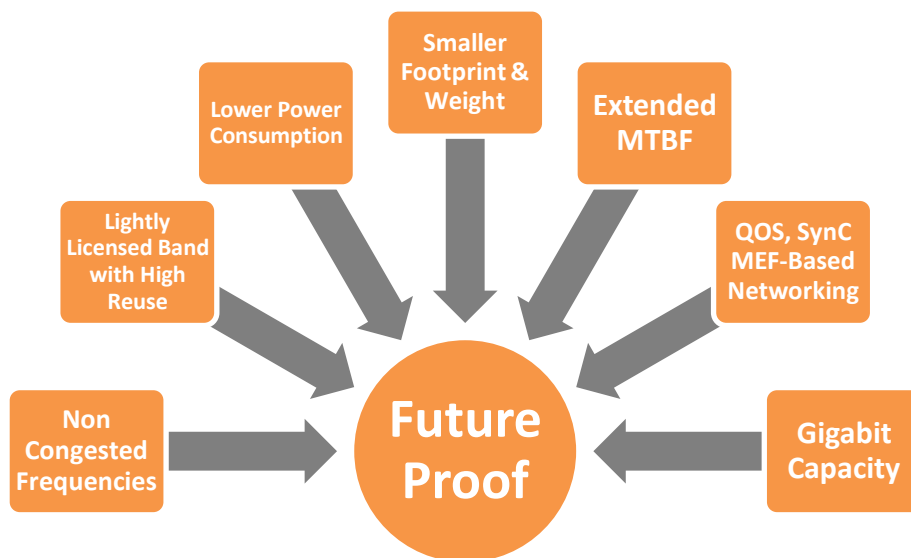


Figure 2: Optimized Wireless Aggregation Hub

Features and Benefits



The proposed solution also frees up MW frequencies for other links.

The EtherHaul™ radio link adopts:

- **QoS** concepts used in the carrier Ethernet network and will prioritize, limit and shape any type of traffic based on various options (Vid, DSCP, Pbit, and Experimental). It will also enable 2 stage priority mechanisms. For example, first by DSCP and then by MPLS experimental bits.
- **Synchronization**. The radio link supports both L1-based SyncE protocol and packet-based IEEE 1588v2. The sync scheme used in the carrier Ethernet network will be adopted by the radio links and delivered to the remote Cell Site Router and cellular site.
- **CFM based OAM** used in the carrier Ethernet network that enable smooth, end-to-end service monitoring and easier failures detection
- **Hitless, QoS-based, adaptive radio modulations** for smooth operations in all weather conditions.

Solution Components

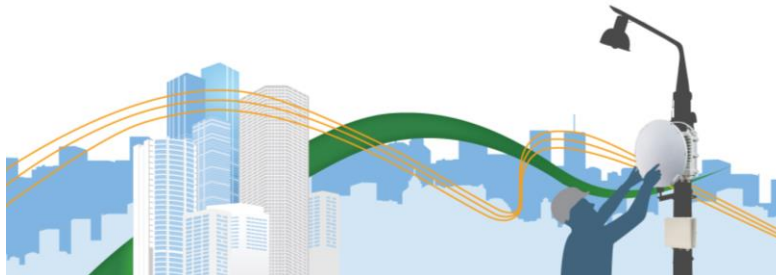
The remote cellsite wireless aggregation hubs solution is an integration of field-proven MMW radio technology-based EtherHaul™ from Siklu with any standards-based cellsite access routers. Siklu's EtherHaul™ links includes the EH-1200; EH-1200F transmission systems operating at the lightly licensed 70/80 GHz bands. The additional components may include Siklu's SikluView™ Management Platform.

Summary

The remote cellsite wireless aggregation hubs solution deploys cost-effective, carrier-grade links for mobile backhaul networks from Siklu. The advanced gigabit capacity links future-proof the backhaul network's build in the optimal way.

Next Steps

To learn more about Siklu's remote cellsite wireless aggregation hubs solution and the EtherHaul™ technology, please visit www.siklu.com or contact your local Siklu sales representative.



About Siklu

Siklu delivers Gigabit capacity millimeter wave wireless backhaul solutions operating in the 60, 70 and 80 GHz bands. The top choice of tier-1 operators worldwide, thousands of units have been deployed and deliver carrier grade performance.

Siklu's innovative all-silicon design has dramatically reduced prices and effectively opened the market for ultra-high capacity wireless links. Siklu is currently deploying its next innovation - 60 GHz backhaul that will enable mass deployment of small cells and other street-level networked devices.

For further information, visit www.siklu.com

Acronym

CAPEX - Capital expenditures are expenditures creating future benefits.

DSCP - differentiated services code point

EXP bits - Experimental bits (currently known as TC) a 3-bit Traffic Class field for QoS (quality of service) priority (experimental)

MEF - Metro Ethernet Forum

MMW – Millimeter Wave. Refers to wireless links operating at the lightly licensed 71-76/81-86 GHz bands and 57-66 GHz unlicensed band.

MPLS - multiprotocol label switching

QOS – Quality of Service

OAM - operations, administration, and maintenance

OPEX - An operating expense, is an ongoing cost for running a service

TCO – Total cost of ownership

ToS - type of service

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