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Build a Better Network

With Corning Solutions for SD-LAN and Cellular

Not all cellular requirements are the same.

Your solution shouldn't be either. Cellular coverage is becoming mandatory for most governments, enterprises, and venues, with service demands increasing every day. Each installation can require different types of connectivity in the indoor cellular infrastructure. A Corning SpiderCloud® enterprise radio access network (E-RAN) combined with SD-LAN offers integrators and building owners a flexible transport alternative to traditional Ethernet switches. Our expert team can help find a customized, affordable solution that's right for you.

To **learn more** about solutions that fit your needs and comply with local regulations, visit **corning.com/flexibility**

Plan to save

To be sure you're creating the most cost-effective solution for your building, it's important to take these factors into consideration:

- Ethernet/IP
- Network separation
- Power protection
- Long distances
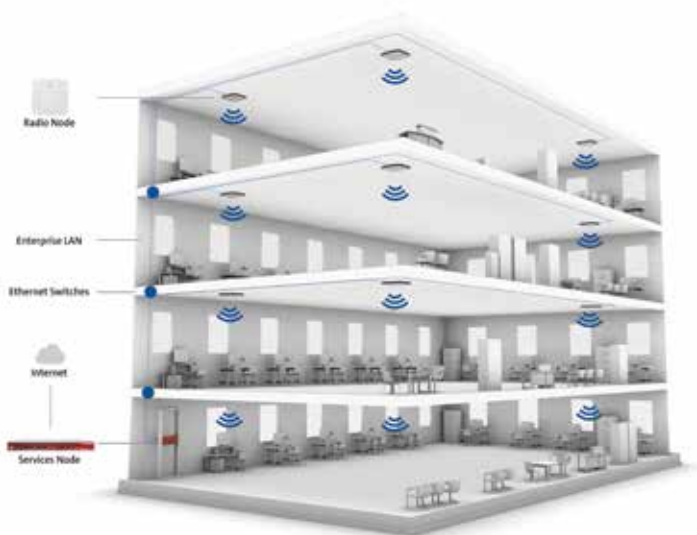- Attached systems
- Future-readiness

Introduction to E-RAN Ethernet/IP Connectivity

What is an enterprise radio access network (E-RAN)?

An E-RAN provides reliable cellular coverage and capacity inside a building.

Where does an E-RAN use Ethernet/IP within a building?

Ethernet/IP connects the radio nodes installed throughout the building to the services node that manages them.
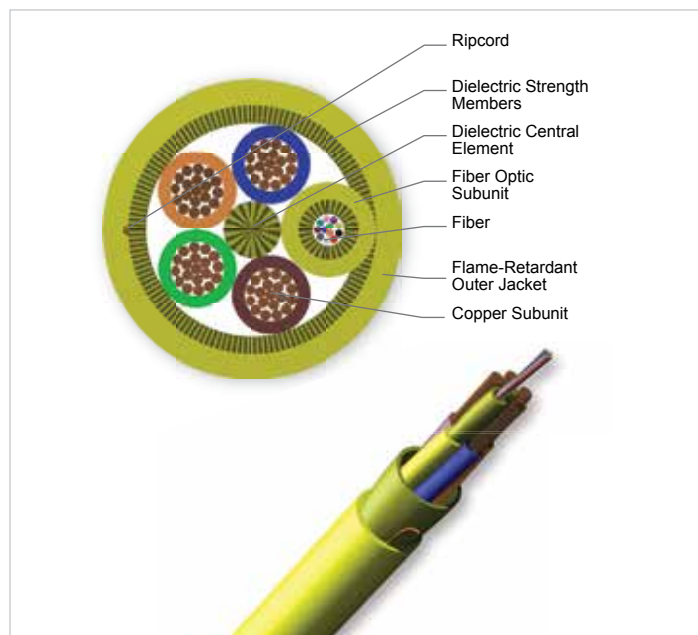

How does an SD-LAN work?

SD-LAN decouples the network software from the hardware to provide better network control and customization. Because it's self-organizing and centrally managed, it's more adaptable and simpler to operate, integrate, and scale. An SD-LAN system uses a virtual host server to house the network control software, a software-defined data plane that is typically used as a network switch in a top of rack configuration, and software-defined access nodes (SDAN) that provide device connectivity and control at the edge of the network. An SDAN available in multiple port counts and configurations can be installed in the ceiling, on a wall, or at a desk to provide connectivity where you need it. Remote powering provided through composite fiber and copper cables enables Power over Ethernet (PoE) making device placement and configuration a snap.

How many virtual networks can be supported on an SD-LAN?

Each E-RAN requires its own virtual LAN, or VLAN. A four-port SDAN can deliver up to four PoE+ ports on four separate networks to connect E-RAN radio nodes. An eight-port SDAN can deliver a maximum of eight ports.

What is Corning® ActiFi® composite fiber?

Corning ActiFi cables provide the ultimate solution for indoor remote powering of any technology that transports data over fiber but requires a power source.

ActiFi DAS Cables for Indoor Plenum, 12 Fibers

By integrating copper and fiber into one cable, ActiFi cables eliminate the need to install separate power and fiber cables. This saves installation time, labor costs, and duct or tray space.

What is the distance limitation from shared equipment to an SDAN?

The maximum length is approximately 2,000 feet. This supports most commercial buildings.

Designing for Connectivity Requirements

To develop the most cost-effective solution for their building's requirements, network designers need to take a number of factors into account. Often, the best solution is an SD-LAN implementation. Below we'll look at requirements to consider, options, and our recommended solution.

Ethernet/IP is the global standard for communications. It's the standard transport in the majority of networks, regardless of the medium used to carry it (optical fiber, copper, or wireless).

✓ Enterprise Ethernet switches and SD-LAN both support Ethernet/IP

Network separation is required by many information security guidelines. This means that E-RAN Ethernet/IP data flows cannot use the same network as internal corporate data. Network separation can be accomplished logically via VLAN or physically via separate Ethernet switches.

- Enterprise Ethernet switches support VLAN
- Separate network for E-RAN has limited requirements

✓ SD-LAN for separate network and multiple E-RAN implementations

Power protection is required for public safety, so cellular service will continue to operate when power fails in a building. Employees, contractors, guests, and first responders need communications services regardless of building status.

- Enterprise Ethernet switches have very high CapEx and OpEx costs to power protect.

✓ Use SD-LAN with centralized power to enable cost-effective and targeted power protection.

Distances longer than 100 meters require optical cabling plus power for the attached cellular radio(s). This application is not supported for the majority of enterprise-class Ethernet switches as they assume optically connected systems have their own power source.

✓ Use SD-LAN as it features optical network terminations (SDAN) that can be supported up to 2,000 feet from core equipment while delivering full PoE+ wattage to attached devices.

Multiple E-RAN systems will affect the economics of transport decisions. When multiple systems are deployed indoors, especially in similar bands, the installation locations will be close and can cost-justify SD-LAN edge networking.

- Comparing transport costs for a dual E-RAN installation per radio location:
  - Enterprise switches: Two PoE+ port costs, four CAT 6 patch cords, two patch panel slots, and two CAT 6 cable runs.

  ✓ Use SD-LAN: One 4-port SDAN, two CAT 6 patch cords, and one Corning ActiFi® cable run. To add another E-RAN to SD-LAN implementation requires just one CAT 6 patch cord!

Future-readiness in fiber-deep edge networking is ensured by installing ActiFi composite cabling that has extra fiber and copper cables. They can be used, for example, when adding 5G mmWave radios to an LTE E-RAN. This way the labor costs to install the initial ActiFi cabling can be leveraged by future projects.

The diagram below provides an example of how the SD-LAN transport platform can be used to carry multiple E-RAN systems and enable cellular densification.
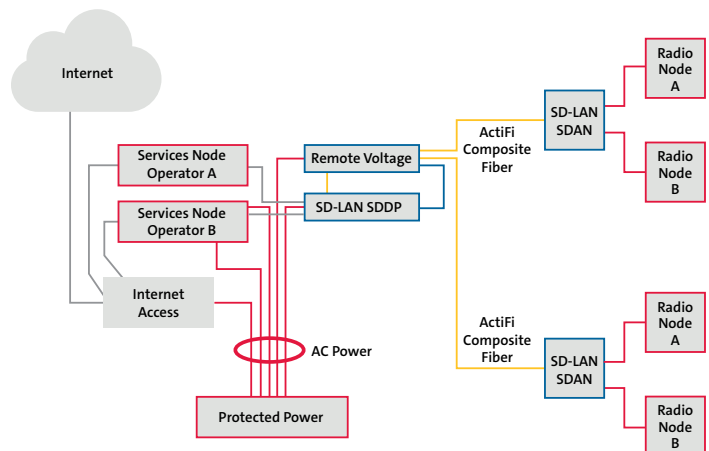
Configuration features

- E-RAN for the commercial spectrum of mobile operator A
- E-RAN for the commercial spectrum of mobile operator B
- An SD-LAN with remote voltage provides both E-RANs with virtual networks (radio nodes and services node)

E-RANs

- Composite fiber connected to SDANs is installed throughout the building
- Each SDAN has a radio node for E-RAN operator A and E-RAN operator B
- Depending on design, SD-LAN remote voltage can be centralized or distributed into floor closets

SD-LAN Transport Platform

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