

Visiting the Physical Layer - IO



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Networking is all about moving data quickly, safely and efficiently. But in a world that's focused on data structure, compression algorithms and other higher concepts, it's easy to forget that data also requires a physical level. In everyday life, data needs to ride on a reliable transmission medium, such as a wire, cable, optical fiber or wireless link.

Inside and beyond the data center, the network physical layer forms the basic hardware transmission infrastructure, including the medium itself. The physical layer creates a working foundation for the network's logical data structures and higher level functions.

When looking for a new data center location, it's essential to ensure that the facility will be able to access, leverage and manage a full array of physical network resources. Here are the key points you should look for:

Location. We're all familiar with the real estate mantra: location, location, location. Well, the same basic idea applies to data centers. To provide the widest possible selection of carrier and network service choices, a data center must be situated in a place where networks from multiple carriers converge. This is one reason why rural data centers, for all of their cost and space benefits, often present serious network connectivity challenges. Having your data center positioned at a network nexus also eliminates the need to insert a local loop or third party between your data center equipment and your preferred carrier.

Routing. The cardinal rule of networking is that performance hinges on using the shortest and highest quality routes. Every carrier has an occasional bad day, so it's important that your data center can spot service outages and deficiencies as soon as they appear and then has the ability to quickly and seamlessly switch between different carriers and routes.

Like a major airport, a very large scale data center serves as a traffic aggregation point. The value of an O'Hare, LAX or JFK is not just that it has flights, but that it has efficient connections to international, national and local

carriers that can take you to any point in the world.

Pathways. Long-haul networking lures people into thinking in abstractions, visualizing network pathways in terms of straight lines drawn on a map. Yet real world network paths are rarely built in direct lines over level ground. Mile after mile, the network medium must accommodate the natural terrain, going over or through mountains, across rivers and around various other natural and manmade obstacles.

Carriers route their media in various ways, such as by following existing highways or rail lines, hitching a ride alongside oil or gas pipelines or via purpose-built conduits. While there are plusses and minuses to each approach, the important thing is that your data center has access to multiple pathways. This way, if something like a gas leak or train derailment knocks out a key route, an alternative path is immediately available to take its place.

Resiliency. Network backbones are vulnerable to an almost endless series of threats, including cable cuts, flooding, equipment failure, software glitches and human errors. While carriers strive to make their networks as reliable as possible, there's always the chance that a connection could go dark at any moment. This is perhaps the most important reason why you need a data center with as many carrier and routing options as possible.

Blended Bandwidth. While having multiple carrier and routing options is essential, so is the ability to leverage this powerful resource pool. Multi-homed blended bandwidth optimizes transit paths efficiently and transparently, enabling network services to function reliably and responsively. Blended bandwidth is the key to network resource management and sustained performance.

Tags: Blended Bandwidth, Physical Layer

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