

Technology Brief

Answering the Lease vs. Own Question for Data Center Interconnect Networks



The massive expansion of over-the-top applications, streaming devices, and cloud services in recent years is driving more and more traffic into data centers, resulting in a demand for increased capacity to meet this rapid growth. This demand also drives an increased need for data center interconnect (DCI), typically occurring between data centers and Internet Exchange Points (IXP). For the purposes of this brief, both of these demands will be considered together as DCI.

Many service providers utilize leased services (multiple 10G and 100G) to meet their DCI needs, largely due to a lack of trained optical personnel in their organization, or because leasing is their traditional way of enhancing or expanding a network. But there are other options that should be considered relative to cost, as these leased services can become expensive to scale, and are typically inflexible and time-consuming when changes are required. As an alternative to leasing, the service provider, ICP or DCO can also lease dark fiber and purchase their own optical equipment in order to meet specific requirements.

Many data centers are rethinking their needs in an effort to maximize economies of scale. In addition, they are moving towards virtualizing their data center networks and implementing software-defined networking (SDN) in order to ramp up the efficiency of their storage, compute and transport systems, as well as to provide a greater degree of flexibility for future upgrades and changes. But is leasing or owning the best option for these new centers?

Benefits of Leasing versus Owning

The choice between leased and owned DCI facilities has strategic and financial implications for data center operators. Each option has its pros and cons, which should be carefully considered.

Leasing

Leasing equipment may be a good initial approach for smaller organizations, but depending on the number of 100G services provisioned, it may be more expensive over time. The lease typically includes operational support with experienced technical support staff, so efficiency and availability are maximized from the start.

The lease option has these advantages:

- No capital investment needed
- Predictable, regular ongoing and operational costs
- Capacity can easily be increased as needed
- Lease fees are treated as operating expenses for accounting and financial activities

Owning

For organizations with multiple 100G DCI services, owning the facilities may be the most economical option over time. If an owned network is deployed by an integration partner, that partner may also provide operations or maintenance services. This means that operators without dedicated optical personnel still have qualified technicians available when setting up and operating new equipment.

The buy/build option has these advantages:

- The center can be customized to individual needs
- There is no risk of losing a lease
- Unused bandwidth can be rented to others, which helps offset costs
- Equipment costs are treated as capital with depreciation for accounting and financial activities.

DCI Service Options for Operators

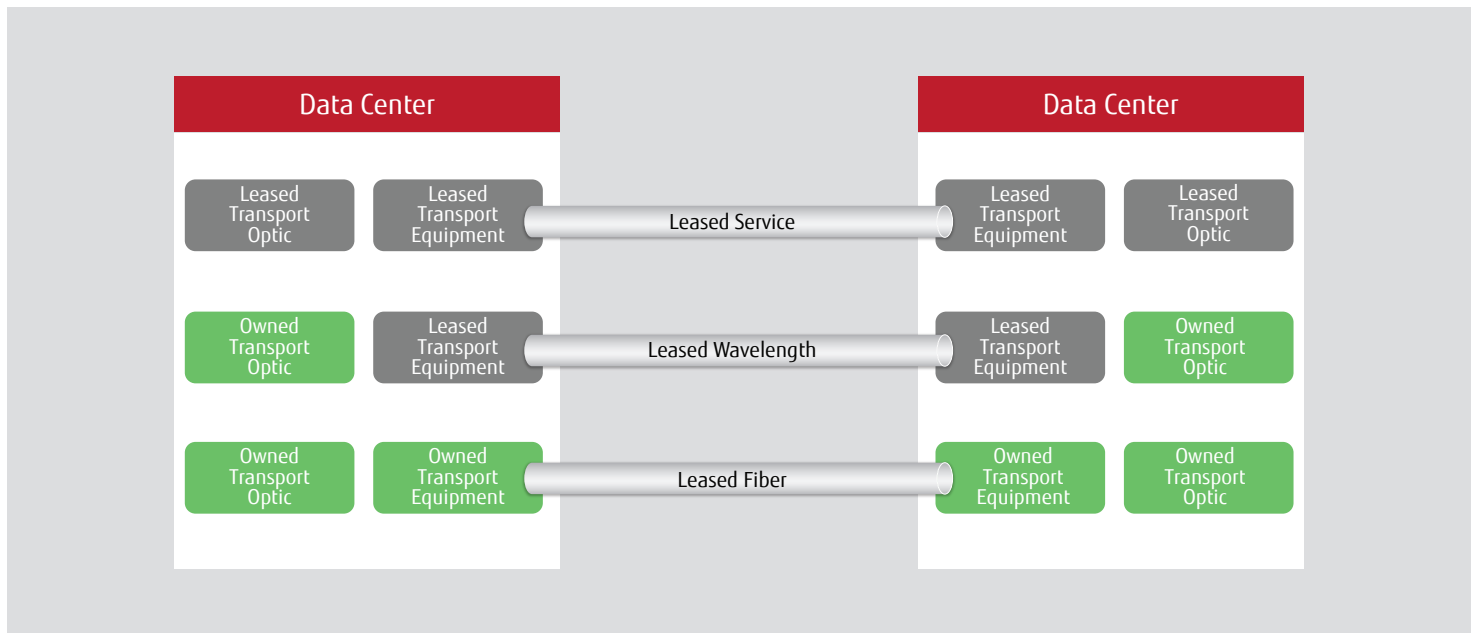


Figure 1: DCI lease versus own options and cost items

DCI Leasing Options

Several leasing options are available to address DCI service needs:

- 1. Leased Service** – A per-service lease in which the service provider supplies transport equipment at a data center and delivers traffic to another data center or IXP, charging a monthly fee.
- 2. Leased Wavelength** – A per-wavelength lease where a specific wavelength on a fiber is leased from a service provider, with that wavelength utilizing a purchased transport optic in the switch or router. In this case, the service provider supplies the transport equipment to deliver traffic to another data center or IXP, charging a one-time transport optics charge and a lesser monthly fee than for a per-service lease.
- 3. Leased Fiber** – A private, self-owned optical transport network with DCI traffic being transmitted over a leased dark fiber connection, incurring a monthly dark fiber fee.

Comparing the Options

Looking at a cost of ownership versus leasing study allows for the comparison of the three DCI leasing options in terms of building an optical network of the same capacity. Figure 2 shows the four-year Total Cost of Ownership (TCO) for each of the above options, using typical values for the various lease rates and optical equipment. The horizontal axis shows the number of 100G services needed, while the vertical axis represents the relative cost of services over the four years.

- In option 1, leased service, there is a simple monthly fee for each 100G service needed.
- In option 2, leased wavelength, there is a smaller monthly fee for each wavelength, in addition to the cost of the transport optic to work with existing switches and routers for each 100G service.

- In option 3, leased fiber, there is a monthly fee for dark fiber and the purchase of transport equipment, including equipment at each end of the fiber for each 100G service. The cost associated with increasing capacity as service demands increase is relatively low, and has been included in this analysis.

Figure 2 shows that leasing is preferable for data center operators that have one or two 100G services, since their cost is either at or below the entry cost of the equipment. Larger operators using three or more 100G services, conversely, see significant cost increases when leasing. This is because leasing services on a per-100G basis is more expensive than adding optics and transport electronics to a transponder using leased dark fiber (option 3).

Financial Considerations

Another aspect to consider regarding leasing versus owning is the impact on financial accounting. When leasing, lease fees are accounted as an operating expense, appearing on the income and cash flow statement accordingly. However, owned property is considered an asset, and thus a capital expense reflected on the balance sheet.

When buying equipment, there is a greater cash outlay at the time of purchase. However, this is recorded as a capital expense that can be depreciated over time, with the income and balance statements showing depreciation as the technology is used. Depreciating capital assets is not a benefit of leased DCI.

In conjunction with the TCO analysis, all financial concerns should be carefully considered and evaluated during the decision-making process, as they can have a significant effect on a company's bottom line in both the long and short term.

Leasing Versus Owning Cost Comparison

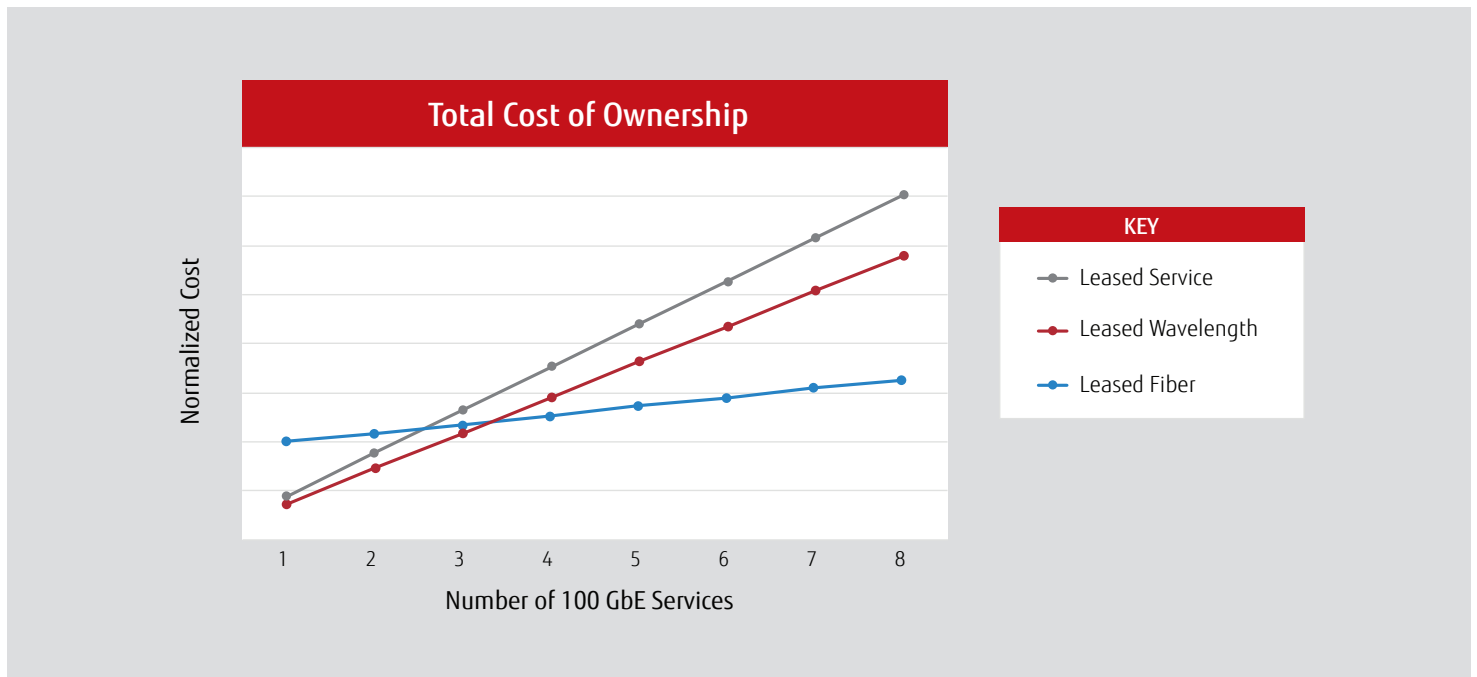


Figure 2: This graph compares the cost of leased services (red and grey lines) versus buying optical equipment and leasing fiber (blue line).

Brief Interpretation and Summary

For data center operators transporting small amounts of traffic—perhaps one or two 100G services between data centers or between a data center and an IXP—leasing 100G services is the most economical plan. But for current needs or anticipated future growth beyond two or three 100G services, owning the transport equipment is the better option, since costs only increase marginally over time due to increasing the capacity of the transponder on an established DCI network as service demands increase.

There is no “one size fits all” answer to the lease-versus-own decision. Each organization must evaluate their current needs and take into account future plans, such as the likelihood of expansion, in order to come to the best possible decision. Additionally, available equipment choices and variations in regional lease rates may impact the cross-over point between leasing and owning. Consulting with a provider of optical equipment to get an idea of factors such as price, lead time, and time to market for service offerings, is essential due diligence.

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