

SD-WAN and network connectivity design: A three-step process to balance price, performance, and risk

WHAT YOU'LL LEARN

- ✓ Three common problems with connectivity design
- ✓ Best practices for network design
- ✓ Leading the design with business needs

SD-WAN and the dynamic nature of hybrid networks are making it easier than ever for CIOs to diversify WAN connectivity with both private and public access methodologies. But this new agility brings with it the responsibility to engineer the smartest network design. After all, IT architectures impact application reliability, visibility, and security too.

No doubt, there's both an art and a science to hybrid network design. The artistry comes with years of experience, but the "science" is really just a few design principles and best practices that are easy to learn. The key is to let business needs lead the design and then strike the right balance between price and performance, so the network adequately supports business continuity and doesn't cross the threshold of risk tolerance. Here is the process that Masergy uses as well as some key considerations that can help keep designs founded in best practices.



78%

Agree

Many network designs fail to lead with business needs

Step 1: prioritize your needs and understand connectivity types

In order to navigate network design compromises effectively, you should have an intimate understanding of your business continuity risk tolerance broken down by application, location, and user group and then also categorized by importance—as critical, important, or discretionary. The result of this inventory exercise should act as a framework for prioritization and a network design blueprint that allows you to match applications/locations/user groups with appropriate connectivity types. Here’s how to do it.

Chart your needs and identify risk tolerance

Create lists of each office or branch location, user group, and business application and categorize the needs of each as critical, important, or discretionary. This will create a footprint of your network needs and help you prioritize them as it relates to network availability risk.

- **Critical** should be used to identify the items that are absolutely essential to your success. Many CIOs think about this in terms of revenue generation or production processes. Can your enterprise manufacture goods or make sales without this application/location/user group?
- **Important** designates the items that are a priority but not necessarily critical. Would your enterprise achieve its goals without this application/location/user group?
- **Discretionary** should be matched with the application/location/user groups that do not impact your business goals, such as guest Wi-Fi.

Sample chart of prioritized needs

Application, Location, or User Group	Business Continuity Requirement
Headquarters	Critical
Branch Location	Important
Guest Wi-Fi	Discretionary
SAP Application	Critical

Remember that this is only an example—every business has different levels of risk tolerance when it comes to network availability and application reliability.

The problem with many WAN connectivity design approaches is threefold:

1. Many designs fail to lead with business needs. All too often the technology platform or access methodology dictates the design.
2. Many struggle in knowing when to use each type of access methodology and how to design around business needs, keeping price and performance top of mind.
3. Many designs take a hardlined homogeneous approach to connectivity, when instead hybrid networks that blend both private and public access might be the best option. You don’t have to decide between an all-private or all-public network.



Don't...

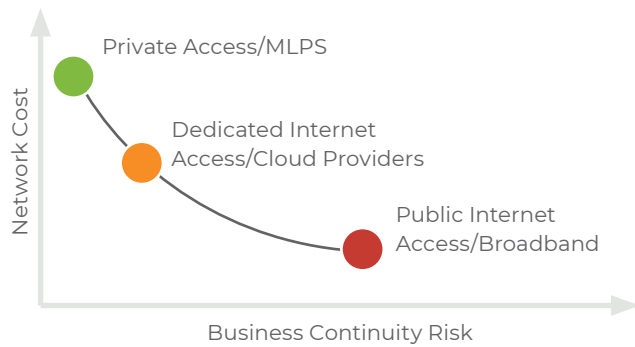
let the limitations of a technology platform or access methodology dictate your design.



Do...

start with an inventory of your apps, user groups, workloads, and workflows, prioritizing the importance of each. Then design from there keeping the cost and reliability of each access methodology in mind.

Network Risk Tolerance Line



Connectivity types: price versus network reliability

Before attempting to match applications/locations/user groups with the appropriate connectivity types, understand the cost and reliability associated with each type of network access. (See chart above.) This is important in helping you balance price and performance. Ultimately, you get what you pay for. The more it costs, the more reliable it will be.

- Private access (MPLS): higher price point but extremely reliable
- Direct internet access (public): mid-tier price point and more reliable
- Broadband internet access: lowest price point and less predictable

Is SD-WAN a connectivity type?

You don't see SD-WAN on the list of connectivity types in the "Network Risk Tolerance" line graph, because SD-WAN is an overlay technology and not a connectivity type. SD-WAN is a routing capability that infuses flexibility and visibility into each WAN environment. It's NOT a method for transferring data.

Connectivity design: three rules of thumb

Every business has different needs and different levels of risk tolerance when it comes to network availability and application reliability, but here are some basic things to know.

1. Broadband over long distances

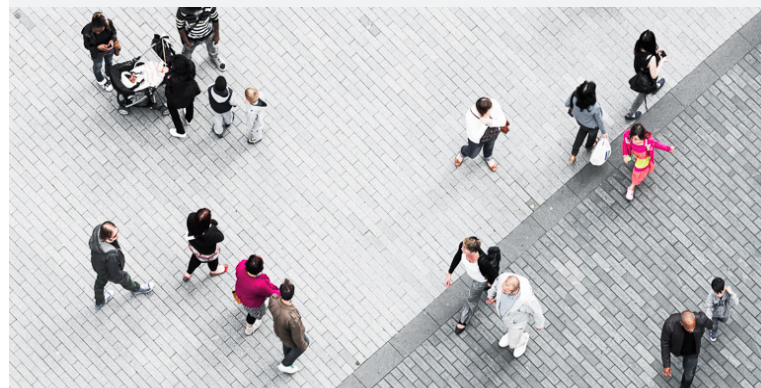
Transporting network traffic over long distances can be difficult with public internet connectivity, which explains why some find broadband best suited for regional transport within a small geographical radius. If your expectation is to provide only the highest predictability and the lowest latency service across the U.S. and across the globe, you may prefer a more reliable access type.

2. Direct internet access and SLAs

While direct internet access (DIA) is more reliable than broadband, you may still want to take into consideration jitter and latency metrics. Most network service providers don't guarantee DIA service with SLAs around jitter and latency. Remember this when planning for your most latency sensitive applications.

3. Private access

While private access remains the most expensive connectivity option, comprehensive SLAs provide the highest levels of predictability with the lowest levels of latency and jitter.



Step 2: design your network

Now you're ready to design.

Let your business continuity needs and your risk tolerance be your guide in mapping your applications/locations/user groups to the ideal network access types that meet both your performance and budgetary requirements. Ask yourself: In an ideal world, what would each location, business unit, and app use as a connectivity method?

Sample chart of prioritized needs mapped to preferred access methodologies

Application, Location, or User Group	Business Continuity Requirements	Connectivity Type or Access Methodology
Headquarters	Critical	Private Access
Branch Location	Important	Direct Internet Access
Guest Wi-Fi	Discretionary	Broadband Internet Access
SAP Application	Critical	Private Access

This is the blueprint for your network design. You may also add a column to the right, planning for both primary and secondary or (fail-over) connectivity. Not feeling confident here? Network service providers can guide you in planning these details.

Step 3: draft your plans and technical requirements

Once you have mapped your ideal network, the next challenge is execution. Whether you're using a DIY approach or leaning on a [managed network services provider](#), these technical requirements will make it easier to identify a networking plan that is flexible and agile enough to deliver on your ideal design.

- Access agnostic: You should be able to mix and match connectivity types and last-mile vendors to strike the optimal balance between performance and price. An agnostic approach to access enables network designs to be customized based on your unique application environment, your user group, and location priorities. [Learn more about access agnostic networks.](#)



Don't...

feel pressured to abandon existing private connections, but rather identify any discretionary locations and less-critical applications that may be able to transition from private to public (i.e. from MPLS to direct Internet access or to broadband Internet access).



Do...

design freely, mixing and matching private and public connectivity types as needed.

- Application and location performance visibility: Because not all of your applications or locations will require the same level of reliability and network support, your solution should provide you with deep visibility into performance as it relates to application and location. This will be fundamental in helping you optimize performance, reduce business continuity risk, and deliver your desired design. [Learn about Masergy's real-time analytics and service controls.](#)
- Network agility: Agility, flexibility, and ease of management are the characteristics of a single global network platform operating on software defined networking principles. Before you sign a contract, make sure you are aware of the provider's infrastructure and change management processes.



Additional resources

- Planning a global network refresh? Five MUST-HAVE questions for your RFP
- Networking, security, and visibility: how the next evolution of technology will serve the CIO
- The total economic impact of Masergy Managed SD-WAN

About Masergy

Masergy is the software-defined network and cloud platform for the digital enterprise. Recognized as the pioneer in software-defined networking, Masergy enables unrivaled application performance across the network and the cloud with Managed SD-WAN, UCaaS, CCaaS, and Managed Security solutions. Industry-leading SLAs coupled with an unparalleled customer experience enable global enterprises to achieve business outcomes with certainty.