

# Cisco Crosswork Hierarchical Controller's Discovery and Visibility Capabilities: 10 High-Value Use Cases

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Cisco's customers are experiencing a network revolution, with a world of multilayer, multivendor, multidomain information at their fingertips. Using Cisco Crosswork® Hierarchical Controller's discovery and visibility capabilities, they have reported 10 common use cases and identified why these solutions are critical to business.

Our customers are experiencing a network revolution with a world of multilayer, multivendor, multidomain information at their fingertips. Using Cisco Crosswork Hierarchical Controller's discovery and visibility capabilities, they have reported 10 common use cases and identified why these solutions are critical to business. Crosswork Hierarchical Controller is the key because it is the only tool available today that discovers the cross-links between the IP/MPLS and optical layers, giving crucial insight into specifically how the layers interact. Without this information, network data is either collected using manual methods, producing data that is quickly outdated, or is simply not collected, leaving you to rely on guesswork.

## Key use cases

1. Increase network utilization
2. Assure network resiliency
3. Automate network audits
4. Reduce order fallout
5. Improve planning
6. Shorten repair time
7. Optimize maintenance windows
8. Manage multidomain business services
9. Empower network analytics
10. Be confident in your network

## Increase network utilization

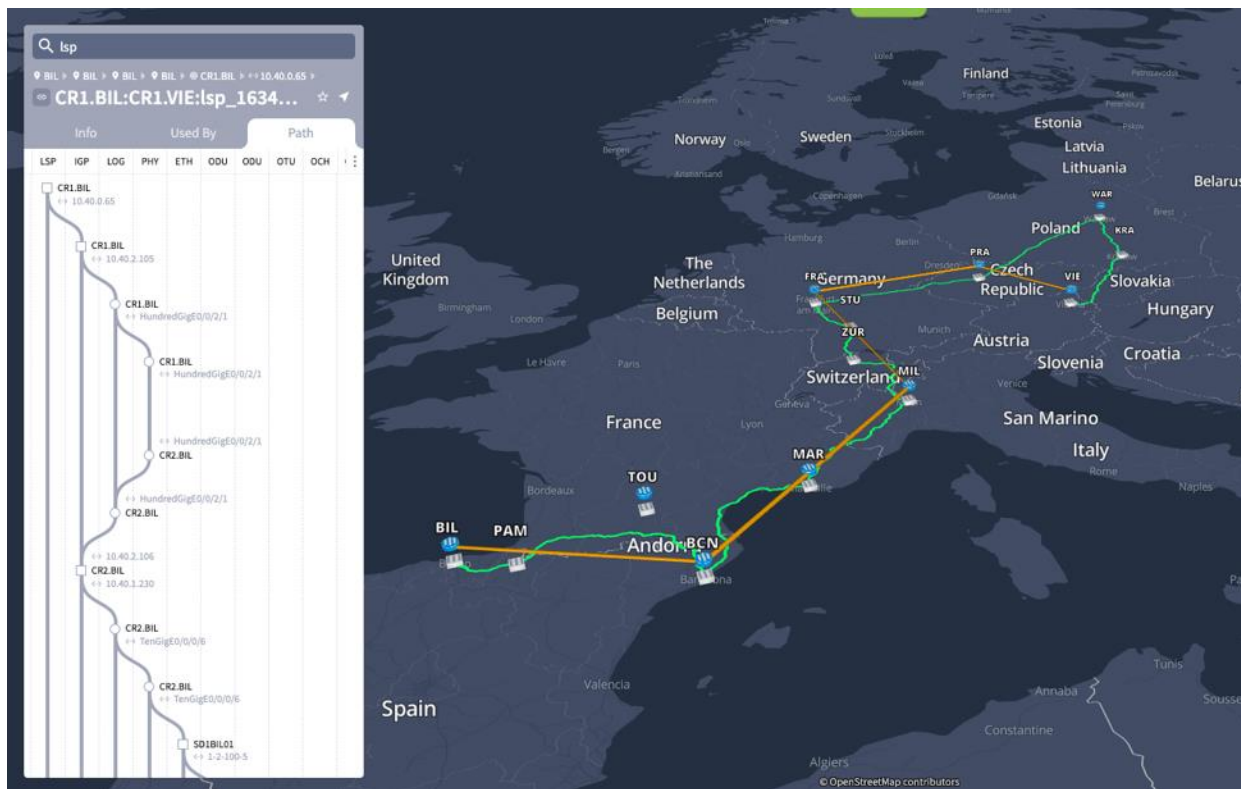
The lack of insight into connectivity and dependencies between the network layers results in a great deal of planning uncertainty. As a precaution, networks are protected by overprovisioning them, which directly impacts CapEx. Protection of a certain service may be doubled and sometime tripled (such as LSP protection, IP link protection, optical lambda protection and restoration). In studying Tier 1 service providers, we found that for every dollar spent, if the network is operating at 18 to 20 percent, only 20 cents on the dollar is used for traffic. The remaining 80 cents is used for other mechanisms, such as protecting the network.

Our customers combat this uncertainty with Crosswork Hierarchical Controller's discovery and visibility capabilities. With multilayer data, you can significantly increase the reliability of your planning, thus routing IP/MPLS traffic more efficiently to run the network considerably hotter. In fact, our research proves that with a target of improving network utilization by only 5 percent over three years, the cost savings in IP/MPLS and optical links amounts to tens of millions of dollars.

## Assure network resiliency

Even with protection mechanisms, such as fast reroute and secondary LSPs, 25 percent of optical links that fail cause IP/MPLS congestion. This is because the data set for determining how to provision IP links is often outdated or nonexistent, resulting in shared risks at either layer. Examples of such shared risks include LSP paths not being disjoint and IP links using common SRLGs (shared-risk link groups).

With Crosswork Hierarchical Controller's network discovery data, you know both the IP/MPLS and the optical impact of a resource going down. Once this is identified, both network layers can be designed to ensure that diverse alternate paths are properly configured. The result is that large service providers are now safely offering transit capacity to other providers. Protection mechanisms are more accurately deployed, guarding against fiber cuts. Outages and penalties are all minimized as a result of being able to deliver premium services with strict SLAs even when there are network failures.



**Figure 1.**  
Exhibit 1: Network Visibility with Crosswork Hierarchical Controller

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## Automate network audits

Network audits occur for various reasons, such as synchronizing inventory records, verifying the network meets regulations, or determining causes of outages so they can be prevented in the future. The present mode of auditing the network is manual, which is resource intensive, can take months, and is error prone. By the time the audit is finished, the data captured in the initial phase is already outdated. There are also gaps in the data because other than Crosswork Hierarchical Controller, there is no way of knowing the cross-links between the layers.

With Crosswork Hierarchical Controller, the audit process is automated, continuous, and error proof. Network audits are completed in a matter of minutes without consuming valuable manpower. Using Crosswork Hierarchical Controller results in highly accurate inventories, shorter support and repair time, and much tighter network control. One customer identified up to \$800K savings in just one metro area of its global network.

## Reduce order fallout

If your client asks for a dedicated 10-Mbps or 100-Mbps port, you generally have no problems fulfilling this order. What happens, however, if they ask for a 10-Gbps or 100-Gbps port? The response is likely that you can deliver it, only to find later that the port is missing or another customer is using it. Since these are high-capacity ports, they represent significant revenue from high-paying clients. In fact, based on IBM data, 15 to 25 percent of the undelivered orders are due to inaccurate inventory data. Those lost orders result in 30 to 40 percent of the known loss in potential revenue.

With a fact-based audit process enabled by Crosswork Hierarchical Controller, inventory is constantly updated so you know exactly what is and is not available. Armed with such information, you can guarantee timely orders based on knowing the inventory and state of each port, thus accelerating time to market. The resulting improved customer satisfaction increases opportunities for future orders.

## Improve planning

Typically, network planners forecast traffic and routes every three to four months and, with this information, analyze many types of data to draw conclusions, such as how many IP links to provide and where best to place them. Communication across the teams about the IP/MPLS and optical layers is laborious and often erroneous. Nonetheless, with their conclusions, they push orders to vendors and go through the process of installing equipment to fulfill these orders. Four months later, this process starts all over again.

In contrast, our customers immediately collect accurate information about their multilayer networks. With customized NetFusion reports, analysis takes just a moment. Moreover, this data can be streamlined with existing design tools, such as Cisco® WAE Design, further enhancing planning accuracy. Consequently, human and network resources are optimized, design cycles are shortened, and CapEx is deferred.

*Because Crosswork Hierarchical Controller is the only solution that identifies all cross-layer connections, it is the only tool that provides exact data to make fact-based network planning decisions.*

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## Shorten time to repair

Network outages occur frequently. Without multilayer knowledge, service providers are using valuable cycles to pinpoint the root cause. Determining the source of the problem often involves multiple experts who are not part of the operation team, creating an unnecessary use of resources and further delaying repairs. Meanwhile, these network outages wreak havoc on delivering SLAs.

Crosswork Hierarchical Controller's multilayer, multidomain visibility provides notification of network problems through an easy-to-use interface and an admin dashboard. With this information, the proper support and operational teams are dispatched to quickly ensure that services are running efficiently. This shorter time to repair minimizes customer dissatisfaction.

## Optimize maintenance windows

Network maintenance requiring code upgrades occurs year-round. Today, many service providers treat these maintenance windows as managed risks, so they are performed very carefully late at night when traffic is low. Despite an extraordinary amount of coordination, there is significant uncertainty because providers are relying on manually gathered cross-layer connection data or on guesswork.

Customers have told us that, prior to Crosswork Hierarchical Controller, after going through these time-intensive efforts, they were sending out a technician only to learn that links were not connected as they had originally thought. Their maintenance attempts were also thwarted when problems unexpectedly arose in the network during maintenance.

By integrating with existing simulation tools, you can perform what-if analysis on Crosswork Hierarchical Controller's multilayer data to determine the maintenance event's effect on the overall network performance. Crosswork Hierarchical Controller removes the speculations, enabling you to coordinate effectively across teams and schedule maintenance with confidence because you know exactly what will be affected. If you are taking down a few links in one city, you know whether another city will be afflicted. Problems are foreseen, communicated, and mitigated. It is that simple.

## Manage multidomain business services

Networks are chaotic. They are usually patches of previous networks that were merged or acquired.

This means most networks consist of multiple vendors across multiple optical domains. While the IP/MPLS layer integrates using protocols, the optical layer has no such interoperability. Each single domain is managed separately through its management system.

In contrast, Crosswork Hierarchical Controller automatically and correctly collects and abstracts the network topology, traffic, and state for you. Using the user interface, you have immediate, end-to-end network visibility across vendors and across domains. No more silos, no more managing single domains. If a service is delivered over OTN in one domain, but over Ethernet in another, tracking and provisioning the service is easily achievable. If there is a failure in one domain that affects another domain, instead of trying to determine the dependency between the two, you have clear visibility into their relationship. Now you can guarantee service delivery across domains using a single holistic view of the multilayer, multidomain network.

## Empower network analytics

Crosswork Hierarchical Controller supports flexible, automated analytics and reporting that can provide most any type of network data. This solution is based on a rich, extensive, and easy-to-use SDK that offers insights

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into your network and business. We customize the reports to fit your specific needs. Not only do these analytics further the understanding of your business, they also enable organizations to communicate more easily. Rather than connecting to multiple systems, we do the heavy lifting for you.

One such customized report was for a Tier 1 service provider who asked to know the wavelength utilization per customer. Their desire to know this data was pure business logic. For instance, if over 60 percent of the month a specific client is using 90 percent of the available bandwidth, then that client is a prime candidate for buying another service. The equation is straightforward: more sold services equals more revenue. Having this type of insight is key to targeting potential customers, not to mention the vast network knowledge that could help you throughout all network operations.

## Be confident in your network

Service providers thrive in a hectic world of problem solving and the unexpected. We understand that you want peace of mind. You want traffic flowing, premium services delivered with strict SLAs met, and satisfied customers. Crosswork Hierarchical Controller covers you by taking the guesswork out of networks. You can design, build, maintain, and troubleshoot based on real multilayer, multivendor, multidomain data.

Once you are confident, advanced Crosswork Hierarchical Controller apps await you, from read-only optimization analysis to user-initiated coordinated maintenance to fully automated restoration.

## Accelerate your journey to next-generation networking

If your network needs to deliver high-bandwidth services with uncompromising diversity and latency SLAs and dramatically lower costs, you'll be interested in Cisco's Converged SDN Transport and Routed Optical Networking solution with Crosswork Hierarchical Controller.

To learn more on how Cisco Crosswork Hierarchical Controller turns your complex multilayer and multivendor infrastructure into a unified, easily controlled network, please visit [www.cisco.com/go/crosswork](http://www.cisco.com/go/crosswork).

To schedule a demonstration of Crosswork Hierarchical Controller, contact your Cisco sales representative.

For more information on how Converged SDN Transport is changing the economics of the network for service providers to deliver connected experiences at massive scale, please visit [www.cisco.com/c/en/us/solutions/service-provider/converged-sdn-transport.html](http://www.cisco.com/c/en/us/solutions/service-provider/converged-sdn-transport.html).

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