Cisco Crosswork Planning

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Cisco Crosswork Planning: Optimize Your Network Performance and Reliability

Product overview

Cisco® Crosswork Planning empowers you to proactively manage your network infrastructure. Providing a comprehensive suite of tools for network discovery, analysis, simulation, and optimization. This data sheet outlines the key features and benefits of Crosswork Planning, helping you achieve:

- **Improved Network Visibility:** Gain a deep understanding of your network topology, traffic patterns, and health.
- **Enhanced Reliability:** Proactively identify potential network issues and optimize configurations for optimal performance under various failure scenarios.
- **Streamlined Network Capacity Planning:** Automate network planning tasks.

Components

Cisco Crosswork Planning comprises these two components:

- **Cisco Crosswork Planning Collector:** This component consists of a set of services that create, maintain, and archive a model of the current network. It achieves this through continual monitoring and analysis of the network and the traffic demands placed on it.
  - New in 7.1: Cisco Crosswork Planning now supports data collection from third-party devices using the support module framework.
  - New in 7.2: Cisco Crosswork Planning now supports Netflow collection on authenticated BGP sessions.
- **Cisco Crosswork Planning Design:** This component helps network engineers and operators predict growth in their network, simulate failures, and optimize the network design to meet performance objectives while minimizing cost.

Key Crosswork Planning features

- **Automated Network Discovery:** Automatically discover multivendor, multiprotocol network devices, topology, and traffic statistics.
  - New in 7.2: Support for QOS in network models
- **Advanced Simulation and Modeling:** Visualize and model network behavior under various conditions, including IGP, MPLS, Circuit. Style RSVP-TE, Segment Routing, BGP and VPN.
- **AI-Powered What-if Analysis:** Predict network behavior in response to potential failures or changes using advanced "what-if" scenarios.
- **Demand Deduction:** Derive accurate end-to-end traffic flows from various sources for better capacity planning.
- **Network Optimization Recommendations:** Receive data-driven recommendations to optimize traffic flow, balance network load, and improve overall performance.
- **Comprehensive Capacity Planning:** Plan for future network demands with insights into network engineering, capacity needs, and traffic engineering strategies.

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- **Automate Planning and Optimization tasks via Jobs Manager:** Schedule and run frequent Crosswork Planning usecases as background jobs, with options to set priority, schedule time, and track job status, including CLI execution and custom scripting support.
    - New in 7.2: The ability to run L1 related CLI tools and user defined Add-ons (customizable scripts/executables) as background jobs.

Benefits

- **Reduced Downtime:** Proactive identification and mitigation of potential network issues.
- **Improved Network Performance:** Optimize traffic flow and network utilization for better user experience.
- **Enhanced Network Reliability:** Identify and mitigate network vulnerabilities.
- **Capacity Planning Recommendations:** Automate tasks and streamline network planning processes.
- **Informed Decision Making:** Gain data-driven insights to make strategic network investments.

Use Case Examples Using Predictive Analysis to Power AI Operations

Visualize Network Models

The Crosswork Planning Network Design feature can visualize an existing network model, run simulations as well as perform optimizations for example.

The Design interface allows us to perform simulations including predictive What-If analysis and Simulation Analysis with Worst Case Traffic view.

Because Crosswork Planning is designed to be a multi-user system, a team of planners and engineers can now leverage on the increased compute footprint to perform simulation and optimizations concurrently, on multiple unique network models.

In the following example, an abstracted network model is observed, represented in a map plot, along with its different objects and attributes represented in table format in the Network Summary section.

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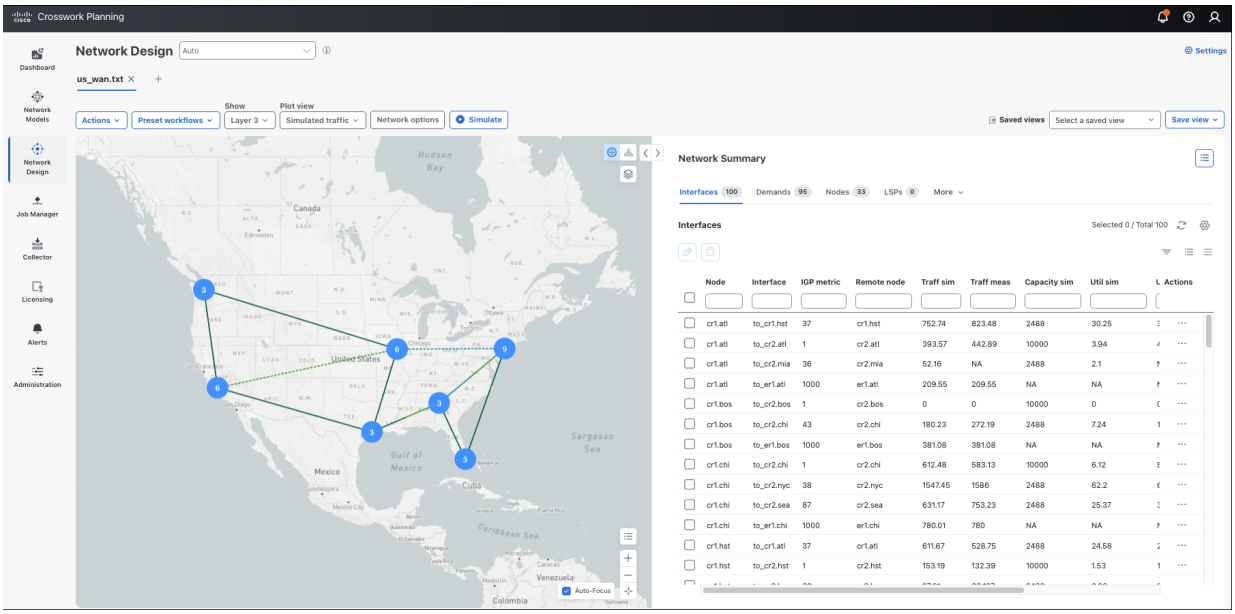


Figure 1.
View of abstracted network model in CP Design

Visualize models

A myriad of icons, colors and route decorations have been incorporated to properly represent the different objects, object states, traffic utilization and routing modes for demands and LSPs.

New in 7.2: The ability to set to foreground different objects, customize traffic utilization and coloring

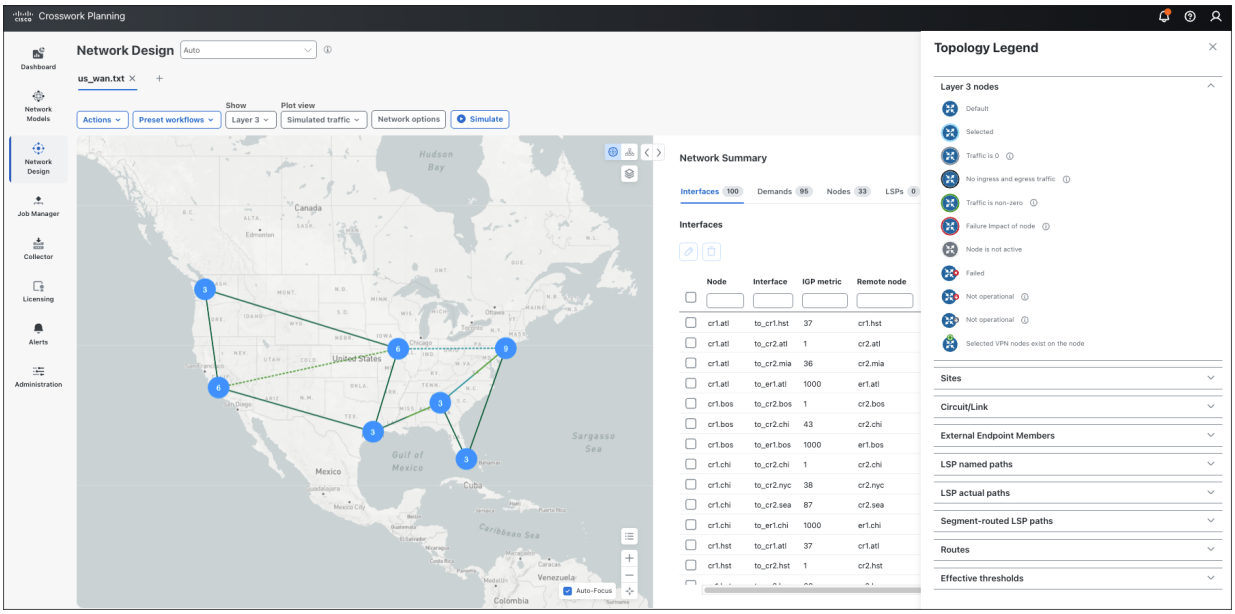


Figure 2.
View of Topology Legend

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What-if Scenarios

Using a “What-if” scenario, Crosswork Planning predicts the utilization in the event of an object (SRLG, Circuit, Node) failure and how traffic would reroute.

In the following example, a demand (representing a traffic flow) from the Seattle region is observed, colored blue, and routed across the network to Houston. See Figure 3.

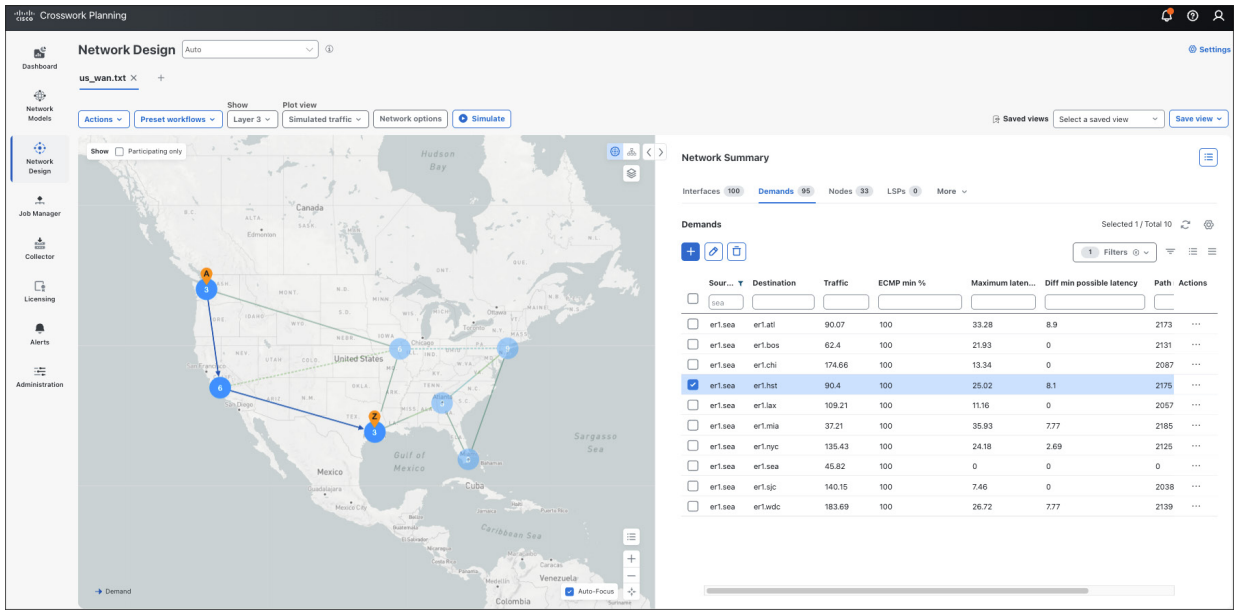


Figure 3.
Demand between Seattle and Houston

In the event of a circuit failure, between Seattle and San Jose, the predicted reroute of the demand is shown. Observe the dotted line below in Figure 4.

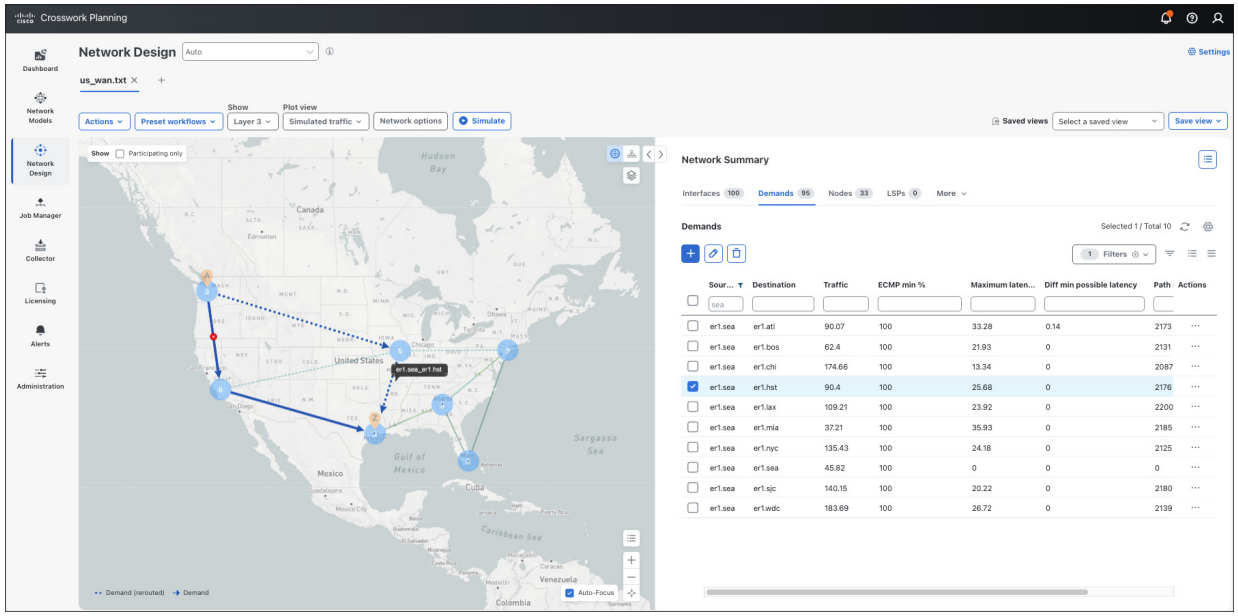


Figure 4.
Rerouted demand after a link failure

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Simulation Analysis

The Simulation Analysis tool combines the simulation results of a large set of failure scenarios. These results are useful for determining how vulnerable a network is to congestion and high latencies under failures, allowing you to plan sufficient capacity for any given failure scenario.

Simulation Analysis runs across a set of failure scenarios that can include selected objects, circuits, and traffic levels. Cisco Crosswork Planning calculates these failure scenarios across all service classes.

The “worst case” is the highest utilization that a particular interface experiences over all the failure sets and traffic levels you selected. Cisco Crosswork Planning determines which combination of failures would cause this worst-case utilization.

Using the Sample WAN.txt plan file in Figure 5 below, the “worst case” or simulation analysis of circuit failures is executed. Crosswork Planning returns the detailed results and views (Figure 6) of the analysis. Operators and planners can now review the results and take steps to mitigate each failure.

New in 7.1

- Vertical scaling of design engine instances: Cisco Crosswork Planning now allows you to dynamically create engine instances, and allocate vCPU and memory based on your requirements. This helps you complete simulation analysis and capacity planning faster, and work with large plan files more easily.
- In addition to selecting a set of failure scenarios individually, the Simulation analysis tool allows you to select a pair of sets of failure scenarios. This enables you to analyse a network model for instances when two concurrent failures may cause significant impact. You can select up to two failure sets for pairwise failure analysis and choose from several variations of pairwise failures to simulate.

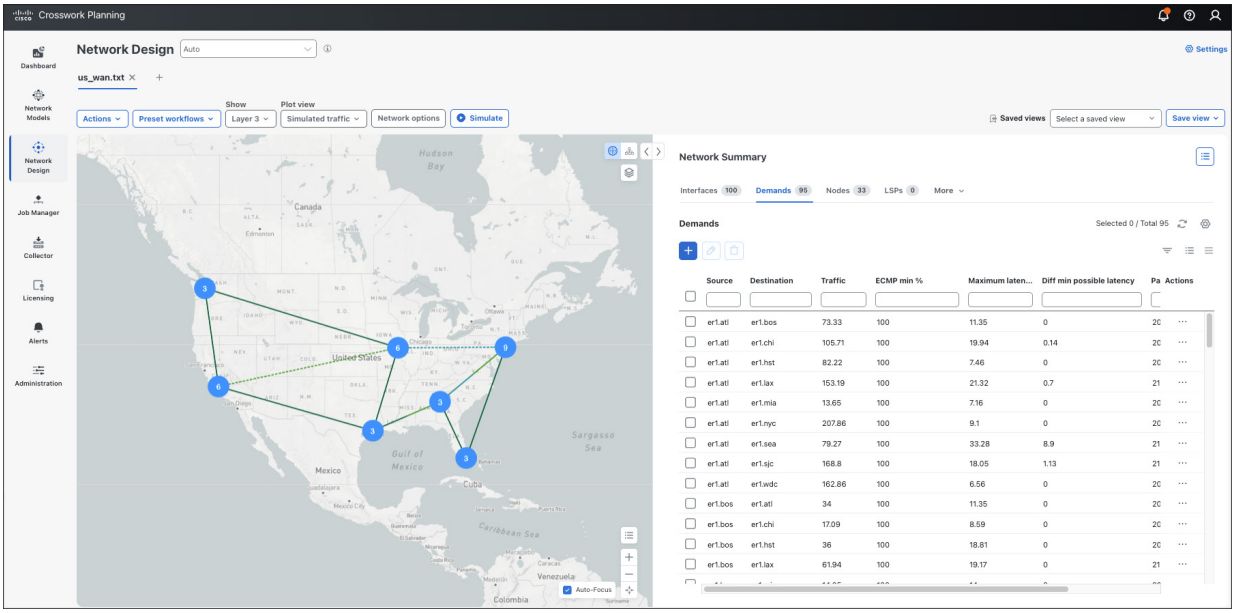


Figure 5.
Abstract network view before “worst-case” analysis

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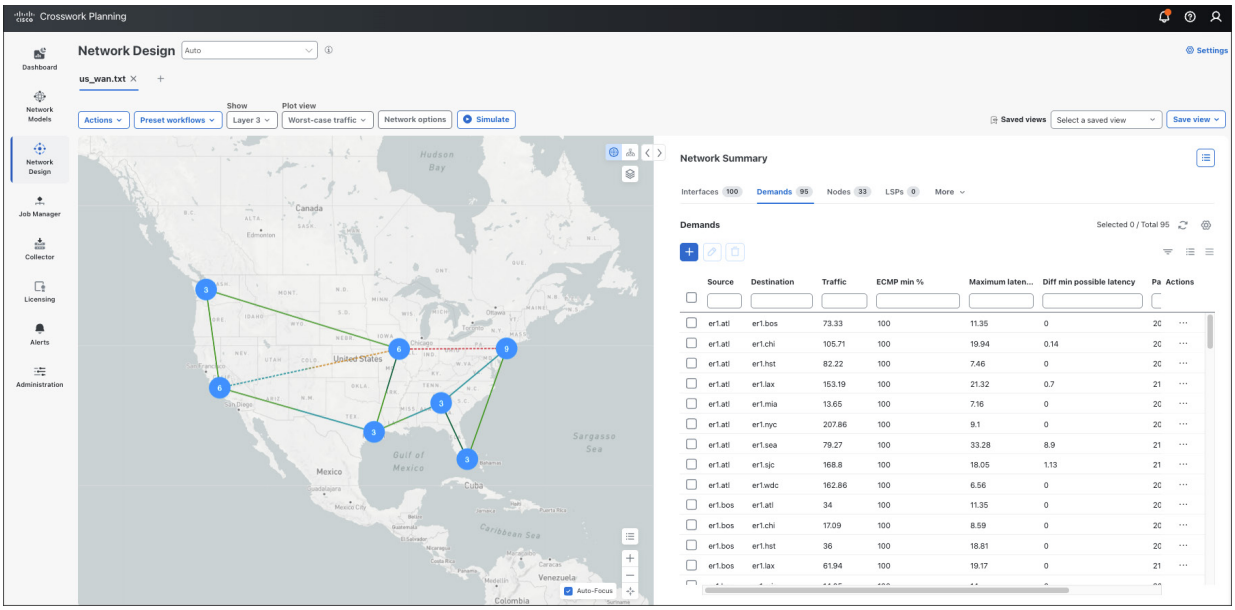


Figure 6.
Abstract network “worst-case” view—please note link color changes

Protocol support

Table 1. Standard protocol support: Key protocols

Protocol	Title
RFC 5440	Path Computation Element (PCE) Communication Protocol (PCEP)
RFC 8231	Path Computation Element Communication Protocol (PCEP) Extensions for Stateful PCE
RFC 8281	Path Computation Element Communication Protocol (PCEP) Extensions for PCE-Initiated LSP Setup in a Stateful PCE Model Through Cisco SR-PCE
RFC 3209	RSVP-TE: Extensions to RSVP for LSP Tunnels
RFC 3630	Traffic Engineering Extensions to OSPF Version 2
RFC 3784	(IS-IS) Extensions for Traffic Engineering (TE)
RFC 7752	North-Bound Distribution of Link-State and Traffic Engineering (TE)
RFC 8402	Segment Routing Architecture
RFC 8660	Segment Routing and MPLS Data Plane
RFC 8667	IS-IS Extensions for Segment Routing
RFC 8570	IS-IS Traffic Engineering (TE) Metric Extensions
RFC 8665	OSPF Extensions for Segment Routing
RFC 7471	OSPF Traffic Engineering (TE) Metric Extensions

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Protocol	Title
RFC 4657	Path Computation Element (PCE) Communication Protocol Generic Requirements
RFC 4655	A Path Computation Element (PCE)-Based Architecture
RFC 5440	Path Computation Element (PCE) Communication Protocol (PCEP)
RFC 3414	User-Based Security Model (USM) for Version 3 of the Simple Network Management Protocol (SNMPv3)
RFC 3416	Version 2 of the Protocol Operations of the Simple Network Management Protocol (SNMP)
RFC 3954	Cisco Systems NetFlow Services Export Version 9

Deployment

Cisco Crosswork Planning offers a breadth of deployment options to address the diverse set of customer use-cases:

- On-Premise: Single VM supported on VMWare vSphere and RHEL KVM (New in 7.1.0)
- On-Premise: Two VM supported on VMWare vSphere and RHEL KVM (For additional scale)

Contact your Cisco sales representative to learn more about these deployment choices, and determine the best option based on the target use-cases.

Licensing

Crosswork Planning software licenses are available as Smart-enabled software subscriptions. For more information, contact your Cisco account representative.

Cisco and partner services

Cisco offers a wide range of services to help accelerate your success with Cisco Crosswork Planning. The innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase operational efficiency and improve your network control.

Cisco Services uses an architecture-led approach to help you align your network infrastructure with your business goals and achieve long-term value. Cisco Crosswork Planning can be combined with the Cisco SMARTnet™ service to help you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise. For more information, please visit www.cisco.com/go/services.

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Cisco Capital

Flexible payment solutions to help you achieve your objectives

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Learn more

- To discover more about Cisco Crosswork Planning, please sign up on our DevNet site: https://developer.cisco.com/docs/wan-automation-engine/#overview.
- Also available are detailed tutorials within Cisco Crosswork Planning documentation: www.cisco.com/c/en/us/td/docs/ TBD.
- To experience a Cisco Crosswork Planning solution in the dCloud, please register at: https://dcloud-cms.cisco.com/help/get_started_steps.

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