



Enterprise
Sales key to
understanding
app traffic

highlight
see clearly



Key concepts

Different applications make different demands on wide area network performance. The ideal is to ensure that each business critical application gets the network performance it needs to deliver its value

When applications are delivered via network connections with the wrong characteristics, it can be business and customer impacting. Relying on intelligent automation to route traffic optimally is a good solution, but how can a business user understand what the automation is doing? Is the routing automation enhancing the business, or degrading it?

Applications can only deliver consistent business benefits when they get the network performance they need.

Application Awareness™

A suite of tools to provide insight into the performance of business critical applications, wherever they're hosted, to manage shadow IT and contain cloud sprawl, ensuring that every customer interaction is a good experience.

RouteVis™

Our performance routing visibility tool, designed to help business-level users see the paths their business critical traffic followed, throughout their distributed, hybrid cloud enterprise, clearly.

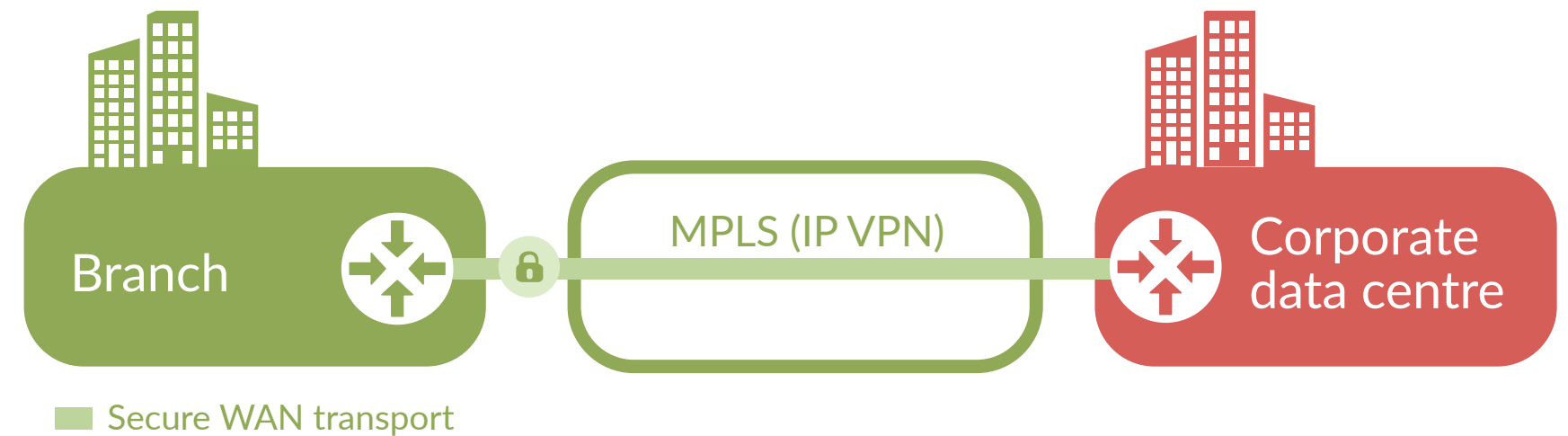


Application
Awareness
ROUTEVIS

Introduction

Back when all of the key applications that a business relied on were hosted on-premises, by the IT department, in the corporate data centre, it made sense to construct an enterprise network that radiated from the data centre to the company's branch offices. This hub and spoke (or star) topology was absolutely the right way to build an enterprise wide area network.

Then...



Then things changed...

37% of companies surveyed have adopted applications hosted in the public cloud ¹

64% of cloud adopters were using some kind of hybrid cloud in 2014 ²

82% of enterprises now have a hybrid cloud strategy ³

68% of respondents said that employees' requests for cloud services had increased, over the past two years ⁴

56% of all cloud workloads will be in public cloud data centres by 2019, up from 30% in 2014 ⁵

(CAGR of 44 percent from 2014 to 2019)

1. "Don't Get Left Behind" An IDC White Paper, Sponsored by Cisco, May 2015

2. IDC's CloudView Survey, December 2014

3. RightScale 2016 State of the Cloud report

4. CDW 2013 State of the Cloud report

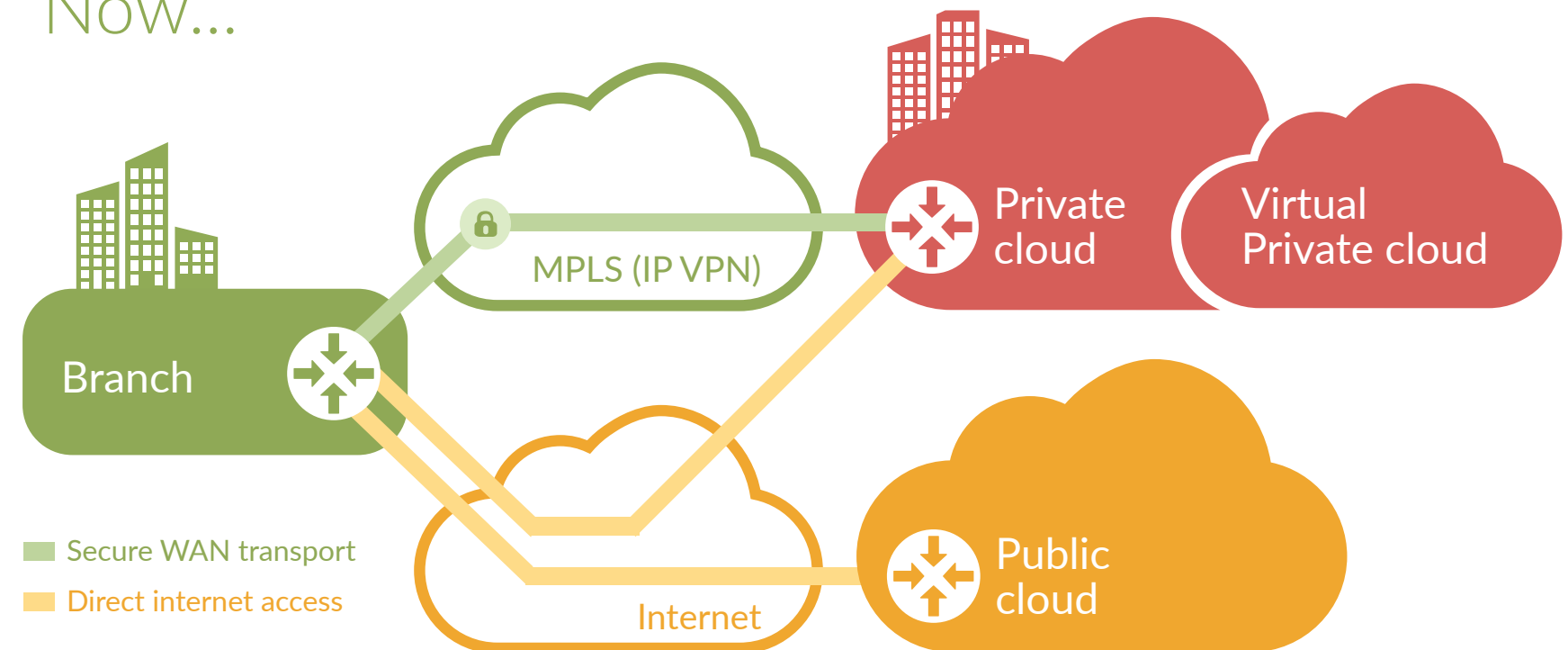
5. Cisco's Global Cloud Index 2014-2019

This means that the applications and data that an enterprise depends on are no longer exclusively in their corporate data centre.

They're also in the cloud and increasingly so. Reaching the cloud from a branch office, via the corporate hub, is costly, inefficient, slower and wasteful.

Consequently, branch offices are directly connecting to the Internet, to reach cloud hosted data and applications. Intelligent branch office routers now have to decide whether to route corporate traffic back to the hub, or directly via the Internet, on an application-by-application basis.

Now...



Make the wrong routing decision and the business is impacted



In theory...

A network engineer could visit and log into every branch router in the enterprise, categorising the local corporate traffic into classes, routing each class over a chosen class of service or link (i.e. back to the corporate hub, or direct to Internet).



In practice...

Having a skilled, highly-trained network engineer at each site, or travelling to each branch location on a regular basis, in order to maintain the static traffic shaping configuration, is just not feasible.

This is why enterprises typically don't correctly categorise and route their traffic, leveraging the quality-of-service features available in most routers. As a result, their corporate wide area networks woefully underperform, unless they are lavishly (and expensively) over-provisioned.

Underperforming networks affect customer experience (and hence profitability) dramatically



Dynamic traffic shaping

It's unsurprising that policy-based, dynamic traffic shaping and routing solutions (SD-WANs) are such a compelling proposition for enterprises dependent on cloud hosted data and applications.

Products such as Cisco's iWAN automatically manage data prioritisation and congestion, mitigate brownouts and black holes, utilise links efficiently and manage time and jitter sensitive applications, such as voice and video.

Set the policies at the master controller



Automatically propagate to all branch routers



Ensure that business-critical traffic is dynamically routed, via the best link available, out of each branch

This routing automation is great, but...

How do you set it up correctly?

How do you know it's doing the right thing?

Performance routing automation can't add capacity...

How do you know when you need more?

Automation will do a great job of routing corporate traffic as best it can, up until the point where it can't...

When the automation reaches the limits of its authority and gives up, do you know why?



Highlight's RouteVis™ feature is designed to provide the insight needed to answer these questions.

In the Network Age we're all now in, networks are the secret sauce at the centre of new business models. They separate the winners from the losers. Agile networks transform industries, society, governments and our everyday lives. They are also at the heart of competitive advantage and the source of disruptions that are reshaping every industry. They're changing the way we live and do business.

For that reason, understanding what they're doing, moment-by-moment, in a clear and business-friendly way, is essential.

Business Impacts

Companies are valued by their ideas and ability to deliver outcomes that customers want



Increasingly, delivery comes down to the agility of deployment of key infrastructure components and applications. Companies live or die according to how fast they can translate good ideas into great customer experiences that work.

Sixty percent of the companies that were in the Fortune 500, in the mid-1990s, aren't on that list today, just twenty years later. They couldn't retain their status because they missed the transition to the Internet. Their inflexible, legacy systems were their silent killers and new Internet-native companies, like Google, Amazon and Facebook, took their place.

Today, there is an even more disruptive change than the Internet, as we embrace cloud services, mobility, data analytics and intelligent, automated IP networks that unleash new, rapid business innovation – technologies that will sweep through every industry, disrupting, creating, destroying and remaking the competitive landscape.

It's impossible to ignore or outrun the trend, so companies can either choose to embrace it or be overwhelmed by it.



Seeing Clearly Matters

The implications are that enterprises can no longer view their IT infrastructure and applications as a wholly-owned and operated walled garden, residing in a hub and spoke network, emanating from a corporate data centre.

They have to become part of a larger ecosystem, leveraging best-of-breed capabilities, wherever they are in the cloud, to deliver superior customer experiences, faster. That, in turn, means connecting to those services over the path that makes the most sense, at all times.

Adopting cloud-based services and intelligent, automated, performance network routing:

- allows a company to out-compete less responsive, less agile organisations
- ensures that the technology enables innovation and business transformation
- offers a renewed approach to collaboration and productivity, which allows the enterprise to pursue new business opportunities

Adoption is eased with better visibility into the workings of the new applications and SD-WANs.

RouteVis demystifies the operation of performance routing and lets companies embrace these vital, new technologies without resistance and fear.

Seeing matters clearly, clearly matters



Rightsizing the WAN

Too much bandwidth (over-provisioning) erodes business margins. Paying for under-utilised WAN links is a cost to be avoided. Conversely, too little bandwidth (under-provisioning) degrades customer experience and makes employees less productive.

Cisco's PfR (included in their iWAN product) can do a lot to balance load and maximise the utilisation of available WAN bandwidth resources, but it can neither reduce nor increase the bandwidth provisioned. Using RouteVis to see the re-routing actions taken by PfR, to maintain efficient use of the available links, can reveal when more bandwidth is necessary to support business objectives, or when provisioning is needlessly generous, resulting in too little traffic over all links.



Protecting Business Critical Application Performance

When bandwidth is finite, crowding out business-critical applications with optional ones is bad for business. Sanctioned applications should get the bandwidth they need, but unsanctioned applications perhaps shouldn't. The impact of redirecting these via best effort links, instead of consuming more valuable network resources, can be verified using RouteVis.

Getting priority traffic through the WAN with the necessary quality-of-service can be the difference between business enhancing and business depleting applications. The technology should empower, rather than hinder, an enterprise in meeting its business objectives.

RouteVis can show you when business objectives are being met.



Productivity and Retention

Productive employees are happy, loyal employees, but they can't be if the tools they depend on to do their work don't have the bandwidth necessary to support them. The purpose of performance routing is to deliver the best experiences for customers, partners and staff.

RouteVis can validate that key business applications and tools are getting the network performance they need and indicate when they're not.



Taming the Automation

Without orchestration, PfR can be intricate to set up. PfR requires a lot of administrative planning, prior to its deployment. It demands careful consideration and effort, the lack of which could lead to unreliable results.

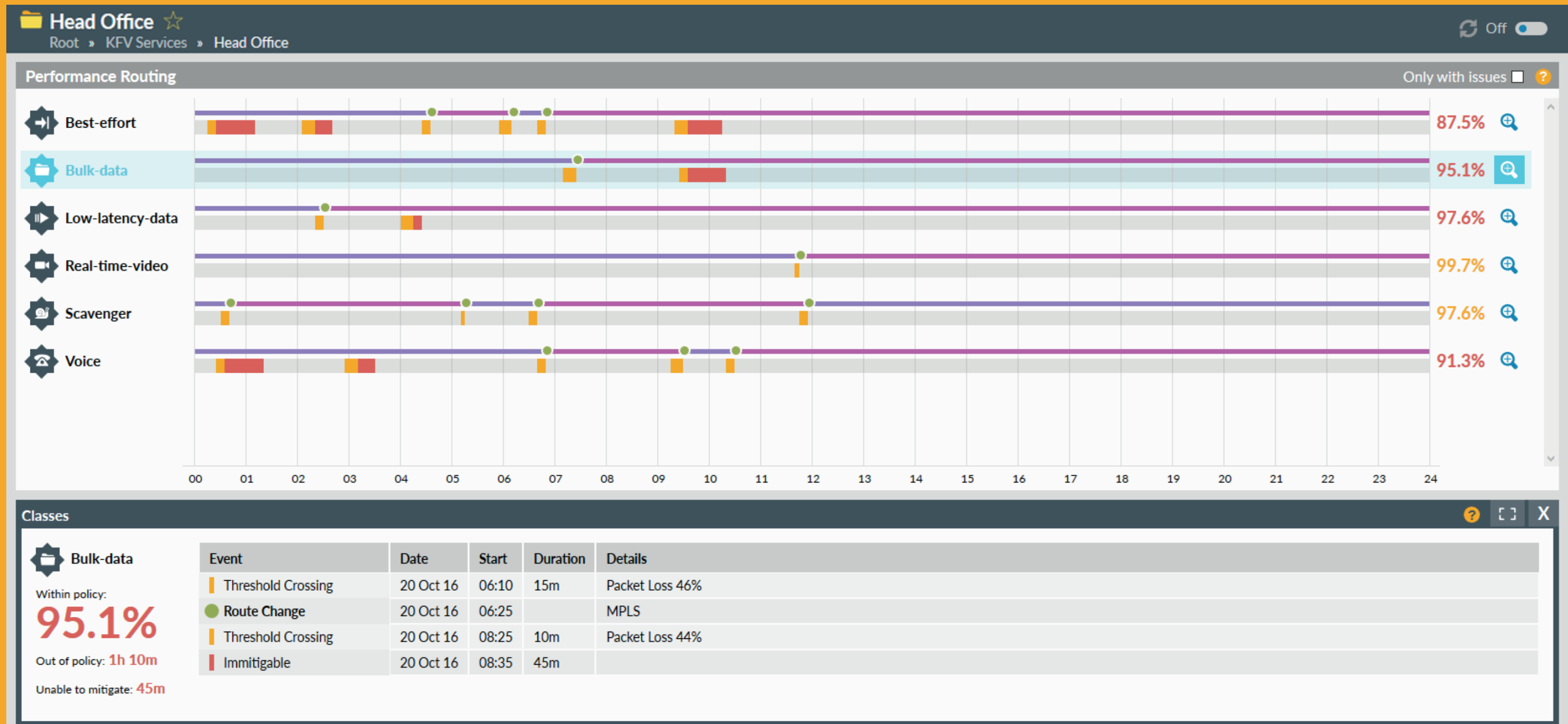
With orchestration, PfR can be hard to tune. PfR can reduce WAN operating expenses, use all available WAN bandwidth efficiently, improve the performance of key applications and improve application availability, but only if correctly configured.

Using RouteVis, the dynamic action of PfR configuration can be verified visually.

Removing the fog

Seeing Performance Routing Events Clearly

Characterising the application traffic and tying it to branch office locations is an important step in defining policies and practices which allow the company to reap the benefits of cloud based applications, while minimising the risks and the costs to the business of unmanaged, unsanctioned application usage.



Cisco PfR Visibility

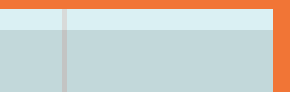
In its initial release, RouteVis supports Cisco PfR exclusively, but the design of the UI is intended to provide a vendor-agnostic view of any intelligent routing solution in the WAN. As other products gain market prominence, Highlight intends to include their routing events within this same presentation framework.

For every branch router under PfR control, there is an entry in Highlight's tree structure, representing each branch location. Navigating to each PfR managed location in Highlight, RouteVis shows the location-by-location details of the PfR policy compliance for traffic to and from that branch office.

Using the date navigator, you can display the traffic class routing history, over a time span of days, weeks or months. RouteVis allows you to filter the display, so that only traffic classes with issues are displayed

Three kinds of events can be shown

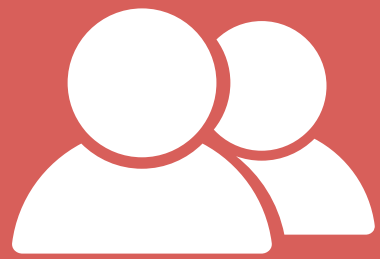
- 1** A **route change event** is depicted as a green dot. Hovering over either side of the event shows the name of the route the traffic is traversing, before and after the route change. These dots appear on the time line, indicating the time at which the route change event occurred.
- 2** **Threshold crossing alerts** are depicted as amber regions, indicating the duration of the out of policy condition. When you click on the magnifying glass icon next to each traffic class swim lane, a window opens showing all of the threshold crossing events. The policy threshold condition breached is noted in text in the traffic class details tab.
- 3** The third kind of event, represented by a red region on the traffic class swim lane, is the prosaically named **"Immitigable"** event, where PfR was unable to find a route that would meet the PfR traffic class policy criteria. A large number of immitigable events is generally indicative of too little bandwidth or of low quality connections.



Event	Date	Start	Duration	D
Threshold Crossing	20 Oct 16	06:10	15m	P
Route Change	20 Oct 16	06:25		M

Business Benefits

Without clear feedback, at a business level, performance routing and intelligent WAN can be a matter of trust, faith and guesswork.



If the only personnel with full operational visibility of how traffic classes are carried, within the corporate wide area network, are the network engineers that configure PfR, this places a lot of trust and responsibility on purely technical shoulders - people that may not have a complete business context, a clear understanding of business objectives, or final accountability for the business impacts of policy configurations.



Data-driven, fact-based discussion

To have a data-driven, fact-based discussion about how the WAN ought to be treating business critical traffic, so that the policies that operate within the managed routing intelligence can be defined correctly, seeing the effects of PfR configuration with real corporate data traffic is essential.

RouteVis provides that visibility. Because business-level users can view, grasp and understand the operation of PfR at a glance, using RouteVis, they can provide effective stakeholder oversight to routing policy configuration.



Right-sized bandwidth allocation

With the data RouteVis displays, bandwidth allocated to key WAN links can be right-sized, so that traffic classes remain within policy, irrespective of actual load encountered. Business critical applications can be classified so that their traffic has priority over WAN resources.



SLA compliance & policy automation

When the performance routing policies are correctly configured, RouteVis demonstrates the value of the routing intelligence applied, providing the necessary data to prove compliance with service level agreements, over the entire service interval.

More importantly, RouteVis shows how the performance routing intelligence worked to ensure that traffic classes remained within policy bounds at all times, completely obviating the need for humans to take emergency remedial action when links became overloaded or unreliable. The automation took care of it instead.



Value for service providers

For service providers keen to differentiate the value of their SD-WAN proposition, showing how the iWAN solution effectively prevented issues helps prove the value of the technology and maintain their service margins.

When tuning PfR, or retuning it as the pattern of application traffic evolves within the organisation, RouteVis can very quickly reveal whether or not traffic class policy objectives are realistic and achievable. Tuning, against real corporate data, takes less time (and therefore lowers costs). You can also be sure when the traffic policies are right, because RouteVis will show clean traces and excellent policy compliance.

Highlight allows service providers and their customers to see the same data at the same time. This causes new sales and service management conversations about provisioning and configuration and enriches the relationship between providers and their customers. These conversations can lead to up-selling opportunities and can also cement a service provider's reputation as a trusted go-to source for business-focused digital transformation support and capability. Trust is enhanced through transparency.

Summary

To obtain the most value from a Cisco iWAN installation, ensuring that business-critical applications receive the network quality-of-service necessary to enhance customer experience at every location, business-level users need visibility of the effect of their performance routing policies, as measured against real traffic flows in the enterprise


RouteVis allows you to see that information clearly

Get in touch

If you are an SD-WAN service provider, deploying Cisco's iWAN product to your customers, adopting and selling the new Application Awareness feature, RouteVis, will give you and your customers powerful, shared insight into how application traffic is dynamically routed, in the wide area network.

If you are a business user and want to know what's going on in your intelligent wide area network, in an easy to understand way, ask your service provider for more details.

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RouteVis is part of the Highlight Application Awareness. Visit us at www.highlight.net to find out more

