FIVE STRATEGIES TO

OPTIMIZE YOUR NETWORK

TRAFFIC MANAGEMENT FOR SERVICE PROVIDERS

With IP traffic predicted to grow at a 24 percent compound annual growth rate (CAGR) through 2021[1], **optimizing your network to improve efficiencies and reduce costs has become a top priority.** At the same time, creating new revenues to offset rising network costs is imperative.

Consolidation of network services, effective traffic management, and policy-driven automation are proven techniques that can help you both maximize network performance and reduce costs. Many of these optimization strategies help you focus on managing the exponential growth of internet traffic, a significant percentage of which is video.

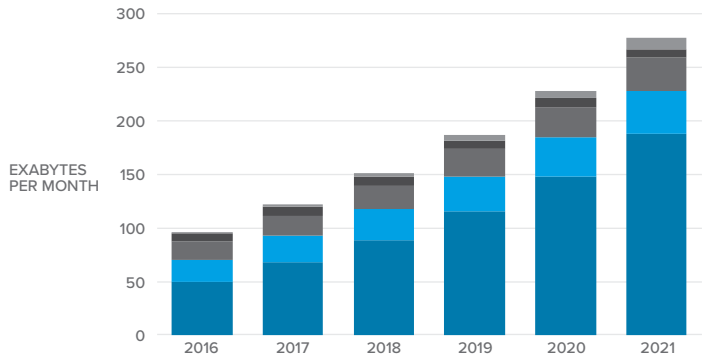
Optimizing your network to improve efficiencies can also help you increase service velocity. Improved traffic management, service function chaining, and detailed network analytics will help you deliver new network services based on subscriber plan, location, and devices. These steps will also help you prepare for 5G implementations that require low latency and high throughput.

Above all, your networks must provide subscribers with the service levels and quality-of-experience (QoE) they expect, while ensuring security everywhere. This includes managing and delivering security protection where it is most needed.

Five strategies that can help you optimize traffic management include:

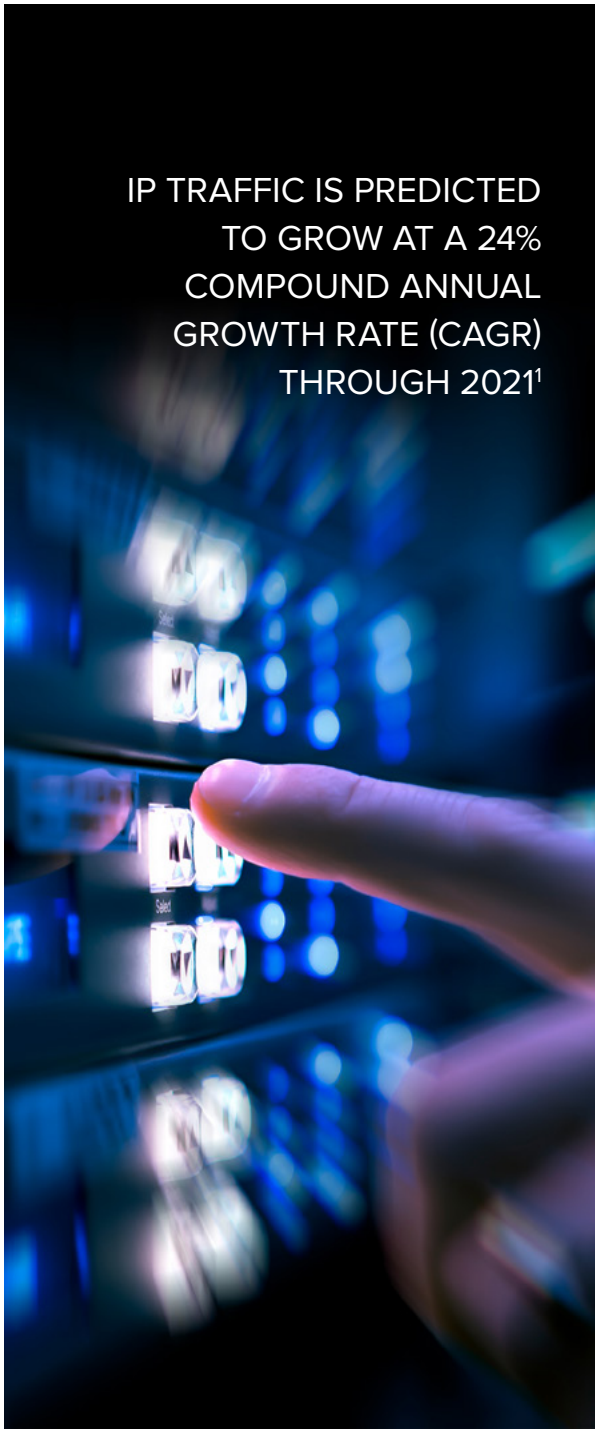
1. Consolidate network functionality
2. Maximize traffic throughput
3. Increase service velocity
4. Enhance service value
5. Leverage analytics to enhance subscriber QoE

GLOBAL IP TRAFFIC BY APPLICATION CATEGORY
24% CAGR 2016-2021



Figures (n) refer to 2016, 2021 traffic shares.

Source: https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.pdf. Figure 13



[1] https://www.cisco.com/c/dam/m/en_us/solutions/service-provider/vni-forecast-highlights/pdf/Global_2021_Forecast_Highlights.pdf

STRATEGY 1:

CONSOLIDATE NETWORK SERVICE FUNCTIONALITY TO REDUCE TCO.

Consolidating network service functionality within the Gi-LAN or at the network edge provides one of the best opportunities to simplify and optimize your network services. A consolidated/unified solution uses a common hardware and software framework to deliver multiple network service functions. These consolidated network service functions can include load balancing, DNS, policy enforcement, URL filtering, CGNAT, firewall, and more which can all be offered on scalable, high-performance platform.

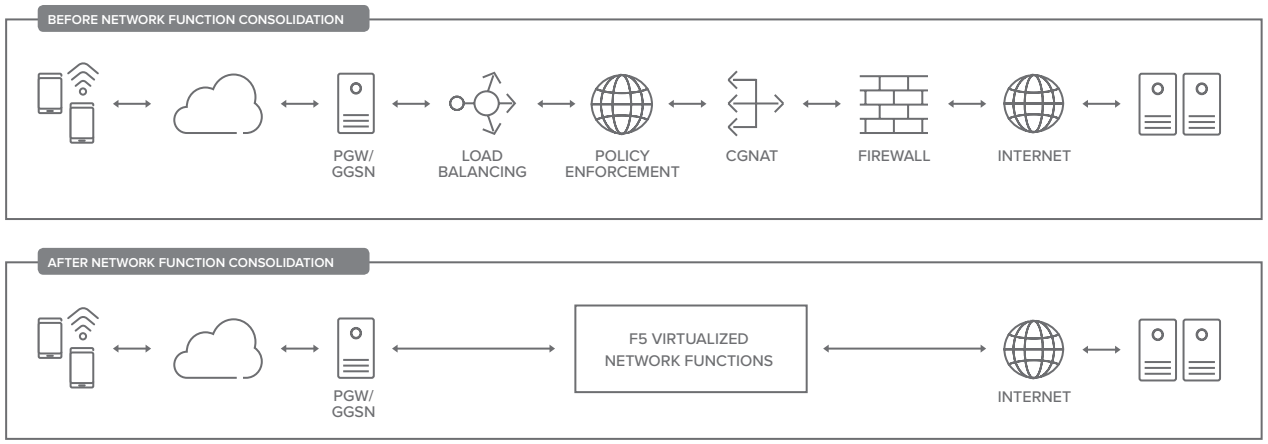
"A UNIFIED SOLUTION HAS 36% LOWER TOTAL COST OF OWNERSHIP (TCO) VERSES AN ALTERNATIVE POINT PRODUCTS SOLUTION."[2]

An ACG Research study, Business Case for S/Gi Network Simplification, states that "a unified solution has 36 percent lower total cost of ownership (TCO) verses an alternative point products solution."[2] This included both CapEx and OpEx savings.

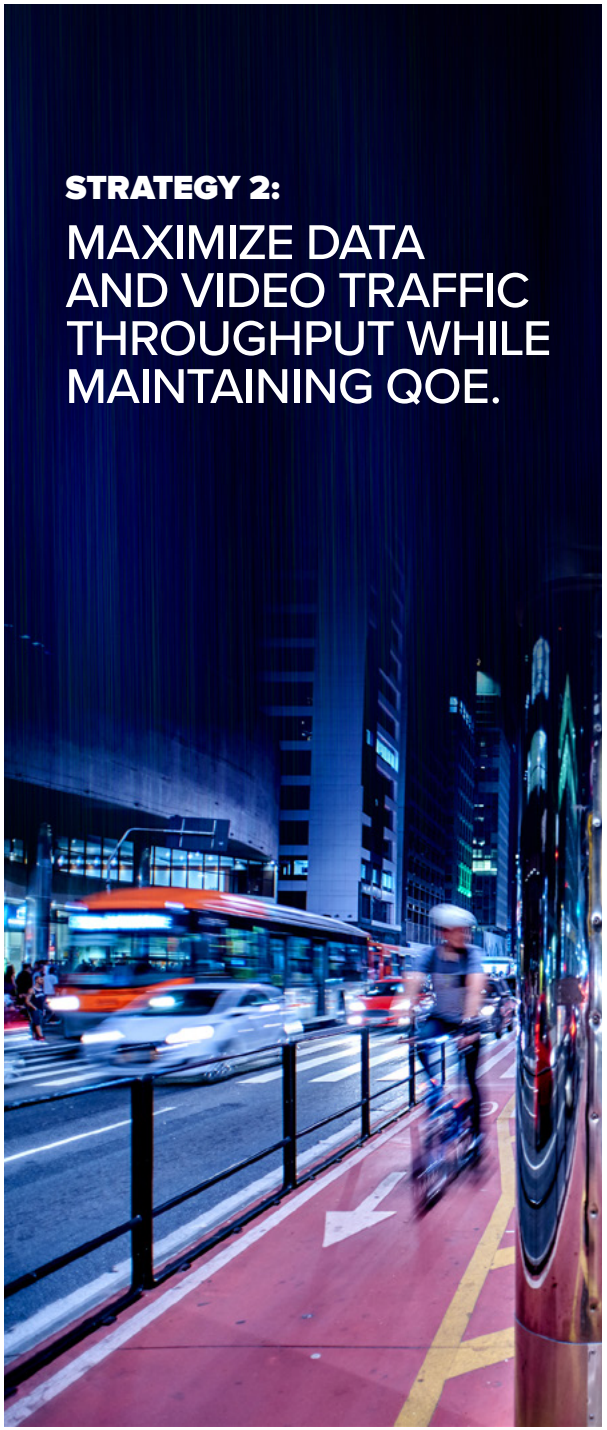
Consolidating network service function benefits include:

- **Increased performance:** Adopt unified network services on a single platform and operating system to deliver increased throughput. You can easily route traffic only where it needs to go.
- **Better scalability:** Quickly scale network services through software license additions.
- **Improved management, reporting, and orchestration:** Simplify inspection, management, and reporting on application traffic entering and exiting your network. Streamline life-cycle and configuration management.
- **Lower CapEx:** Aggregation of hardware by eliminating replication of I/O ports and chassis common equipment.
- **Lower OpEx:** Eliminate multiple vendor contracts and reduce service, training, and vendor management costs.

NETWORK FUNCTION CONSOLIDATION SIMPLIFIES AND OPTIMIZES NETWORK



[2] https://f5.com/Portals/1/Cache/Pdfs/2421/business-case-for-sgi-network-simplification.pdf



STRATEGY 2:

MAXIMIZE DATA AND VIDEO TRAFFIC THROUGHPUT WHILE MAINTAINING QOE.

IP optimization and context-aware policy enforcement can help you maximize traffic throughput and increase efficiencies by quickly evaluating traffic conditions and scaling your network. This allows you to handle growing subscriber demands, all while maintaining peak network performance and simplifying network operations.

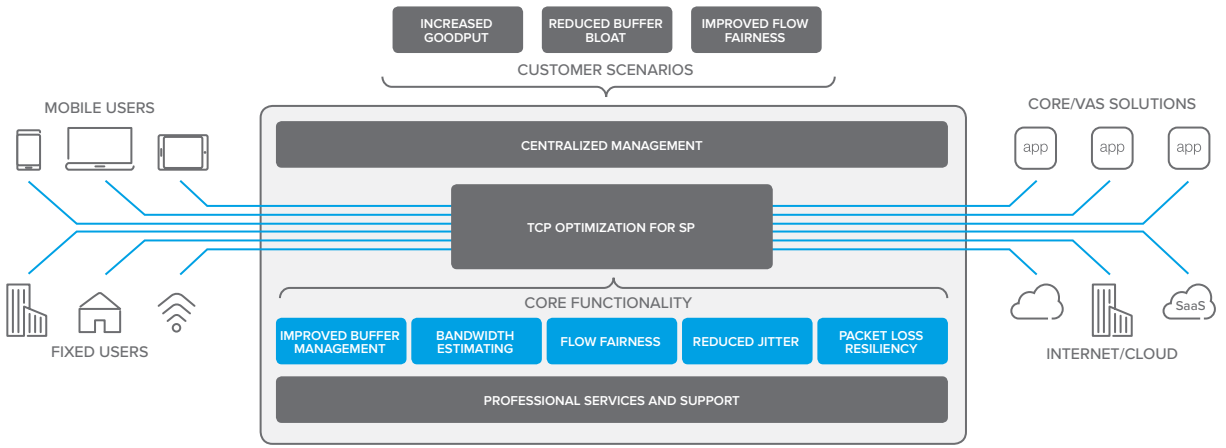
IP traffic optimization provides the ability to manage IP traffic, including TCP and UDP. TCP optimization focuses on enhancing the transmission control protocol (TCP), which accounts for the majority of internet traffic. The ideal TCP stack should maximize a subscriber's QoE. To accomplish this, it must establish high goodput, minimize buffer bloat, and provide flow fairness. UDP traffic management capabilities provide the ability to shape UDP flows.

Context-aware policy enforcement allows you to manage your network traffic with a wide range of policy enforcement capabilities based on a variety of contexts such as subscriber, application, radio access type, etc. Using this insight, you can steer the traffic to suitable destinations, apply appropriate rate controls, and apply different traffic management capabilities.

IP TRAFFIC OPTIMIZATION AND CONTENT-AWARE POLICY ENFORCEMENT HELPS YOU MAXIMIZE NETWORK EFFICIENCIES.

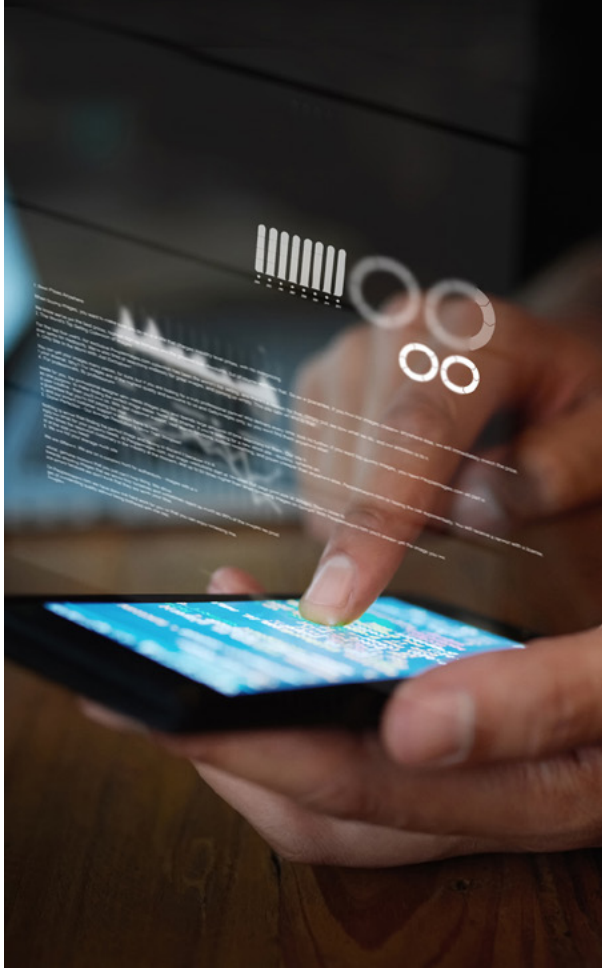
Policy Enforcement Managers can detect video (including ABR video) and dynamically manage this traffic using TCP-proxy-based bandwidth controls or UDP-based flow shaping capabilities. ABR video detection and control enables a rate limited, lower bit-rate format for UDP-based traffic such as YouTube, Netflix, and Hulu when network conditions are non-optimal. Once detected, policy enforcement systems can dynamically manage the video traffic.

TCP OPTIMIZATION FOR SERVICE PROVIDERS



STRATEGY 3:

INCREASE SERVICE VELOCITY TO BOOST REVENUE-GENERATING OPPORTUNITIES.



Delivering new network service offerings will help you counter the rise in network costs. Revenue-generating network services can be implemented based on subscriber level, plan, location, and device. In addition to recognizing who should access what and when, you can create relevant plan tiers and offer new network services based on user behavior patterns.

By associating subscribers with the data traversing the network, policy enforcement can automatically enable network services being offered. These tasks need to be applied in real-time to network data.

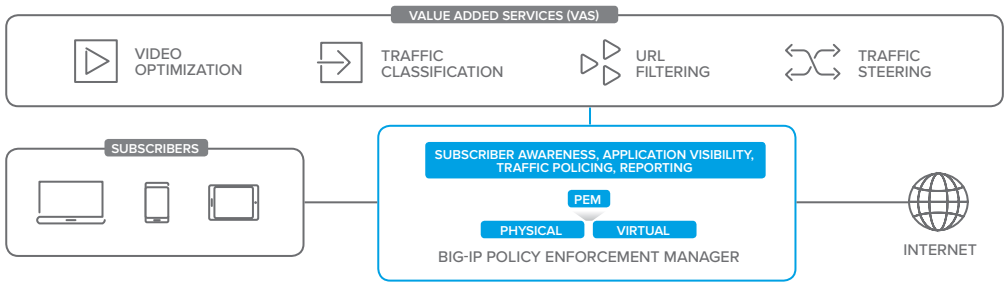
NEW REVENUE-GENERATING NETWORK SERVICES CAN BE IMPLEMENTED BASED ON SUBSCRIBER LEVEL, PLAN, LOCATION, AND DEVICE.

Network Service revenue opportunities include:

- **Subscriber, application, and policy aware bandwidth control:** Identify which applications, network services, and protocols are being used to help you create application-specific plans.
- **Bandwidth on-demand:** Differentiate your offerings by adapting to subscribers' real-time bandwidth requirements and quota management.
- **Charging and quota management:** Integrate with online charging systems (3GPP) and define quotas which are tracked per subscriber/application.
- **Fair usage policy:** Help control rates on a per-subscriber and per-application basis, according to their existing rate plan.
- **Tiered service plans:** Offer specific rate plans based on subscriber preferences and their requirements for bandwidth and broadband speed.
- **OTT monetization:** Detect and classify specific applications and implement unique policies, such as applying a higher quality of service (QoS) to specific applications or excluding applications from a subscriber's data cap.
- **URL filtering:** Implement parental control services, for example, by blocking traffic to specific websites based on specific URL categories.
- **Header enrichment and content insertion:** Provide flexible enrichment of HTTP headers (for example, with MSISDN), allowing operators to tailor network services appropriately.

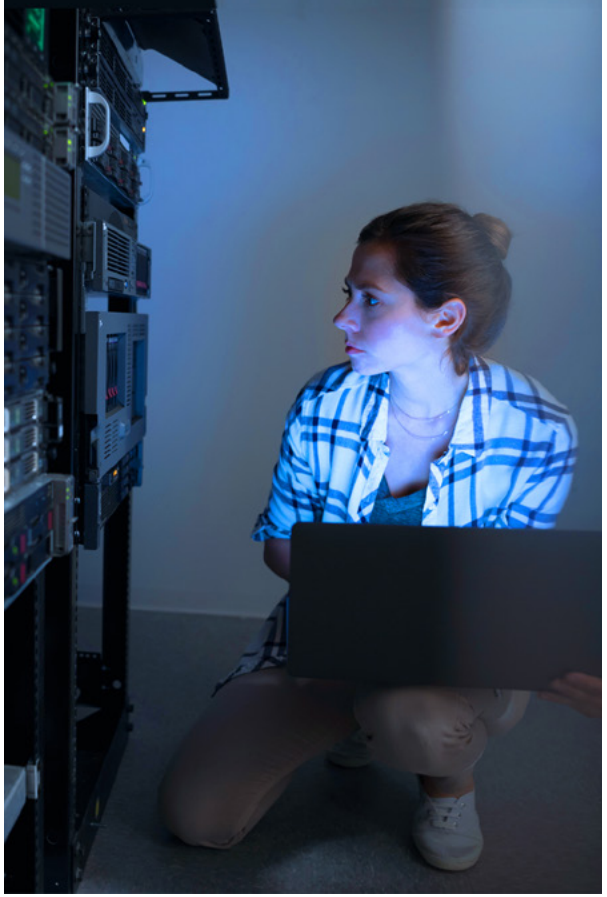
Adding new network services allows you to increase revenues, reduce customer churn, and gain additional brand loyalty. Implementing tiered plans lets you cater to a diverse subscriber base with different expectations in the amount of bandwidth they require, and how much they are willing to pay. And delivering unique network services helps you differentiate from the competition, while improving subscriber QoE.

LEVERAGE POLICY ENFORCEMENT TO MONETIZE VALUE-ADDED NETWORK SERVICES



STRATEGY 4:

ENHANCE NETWORK SERVICE VALUE THROUGH DYNAMIC TRAFFIC STEERING AND SERVICE FUNCTION CHAINING.



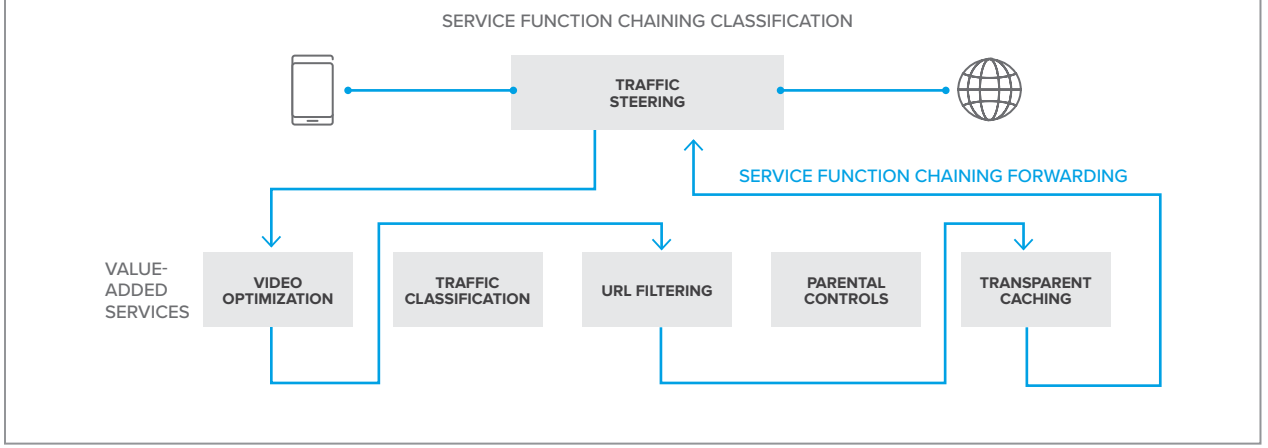
The ability to steer traffic to value-added network services (VAS) intelligently and dynamically based on policies streamlines traffic routing, thereby decreasing network complexity and operating costs.

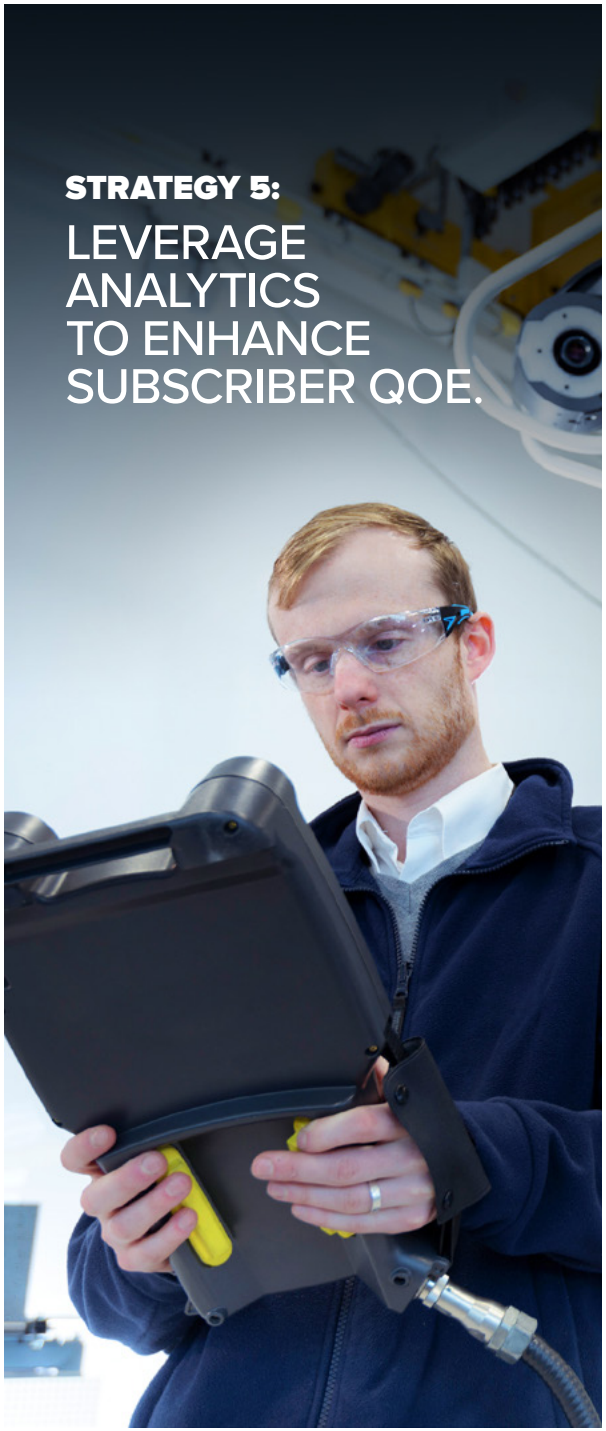
INTELLIGENT TRAFFIC STEERING CAN DECREASE THE TRAFFIC TO VALUE-ADDED SERVICE (VAS) PLATFORMS BY 50% TO 75%, LOWERING THE TOTAL COST OF OWNERSHIP.

Using a subscriber- and context-aware traffic management system, you can implement dynamic service chaining to send traffic to specific VAS platforms within a single call flow. For example, if a mobile device is consuming video, the traffic management system can direct traffic for that device to a video-optimization server. Non-video traffic need not go to that same server, but can be directed elsewhere. Intelligent traffic steering can decrease the traffic to VAS platforms by 50 to 75 percent, lowering the total cost of ownership. Implementing a service function chaining manager allows you to monitor real-time statistics and optimize operational controls.

Dynamic service function chaining lets you add more value for subscribers by linking multiple network services together. As an example, you can send subscribers who want to watch a specific video clip to a URL filtering/parental control service before sending it to a video optimization server. That ensures that these subscribers are allowed (or not allowed) to view the content. Dynamic service function chaining creates differentiated network services and provides opportunities to increase average revenue per user (ARPU).

SERVICE FUNCTION CHAINING HELPS INCREASE REVENUES





STRATEGY 5:

LEVERAGE ANALYTICS TO ENHANCE SUBSCRIBER QOE.

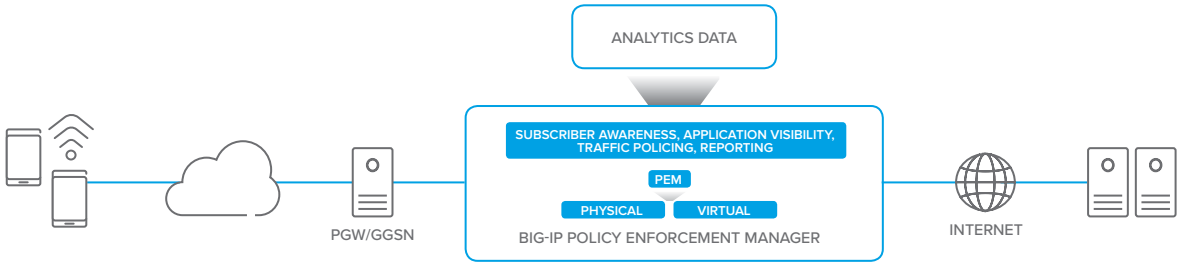
A consolidated traffic management system can provide you with data and analytics of your traffic and subscriber usage patterns. These analytics can help you define and deliver new and innovative network services that cater more closely to subscriber needs and preferences, versus a one-size-fits-all model of generic network services and rate plans.

By classifying and tracking traffic based on subscriber and application type, you can deliver customized service plans based on specific subscriber requirements. For example, if subscribers are interested in a VoIP package, they can opt into a plan with unlimited VoIP usage for an additional fee. Likewise, subscribers interested in a business package can pay a fee to access service-enabling business applications without affecting their data caps.

Gathered data at different levels of granularity (session, flow, etc.) helps your traffic management and orchestration systems further optimize your network. Usage data can also be sent via high-speed logging (HSL) format to an external analytics server. This data can also be used to help you deliver multiple types of network services based on specific market demographics, resulting in increased revenues, improved user experience, and greater brand loyalty.

ANALYTICS CAN HELP YOU DEFINE AND DELIVER NEW AND INNOVATIVE NETWORK SERVICES THAT CATER MORE CLOSELY TO SUBSCRIBER NEEDS AND PREFERENCES.

ANALYTICS PROVIDES WAYS TO INCREASE SERVICE REVENUES



MAXIMIZE NETWORK PERFORMANCE, INCREASE SERVICE VELOCITY, AND IMPROVE SUBSCRIBER QOE.

Consolidating network functionality and maximizing traffic throughput lets you effectively manage the exponential growth in IP traffic. These strategies also help you deliver increased performance, lower your TCO, and improve your subscriber QoE.

Delivering new network services allows you to increase revenues, reduce customer churn, and differentiate from your competition. By optimizing network service functionality, you can increase service velocity and service performance, further increasing customer satisfaction. And by tracking customer data and analytics, you can deliver customized network services further increasing revenues and brand loyalty.

For more information about the F5 Traffic Management solutions, visit https://f5.com/solutions/service-provider/data-traffic-management.

OUR SERVICE PROVIDER COMMITMENT

F5 has the expertise and experience to help you navigate the uncertainties and demands of your changing landscape. We are driven to provide industry-leading service provider solutions that help you address traffic management, network function virtualization, advanced mobile architectures, cable and fixed networks, and infrastructure security. Our proven ability to deliver high-performance enterprise IT capabilities informs the way in which we address every service provider-focused concern and requirement.

We're here to help you make the best infrastructure choices and to deploy the most cost-effective, secure, and robust solutions possible.

Learn about our comprehensive approach to securing service provider networks at F5.com/serviceprovider.

US Headquarters: 401 Elliott Ave W, Seattle, WA 98119 | 888-882-4447 // Americas: info@f5.com // Asia-Pacific: apacinfo@f5.com // Europe/Middle East/Africa: emeainfo@f5.com // Japan: f5j-info@f5.com