



Use Cases

Procera Networks:

Find · See · Do · More

Procera Networks structures mobile and fixed broadband network data, transforming it into actionable intelligence to empower operators to make informed business decisions and improve the quality of Subscriber Experience. Procera's solutions are delivered by our proprietary PacketLogic™ Deep Packet Inspection (DPI) platform, built on 15 years' investment into our best-in-class traffic identification engine, DRDL. Solutions include Use Cases in the areas of Insights Reporting, Traffic Management and Policy Enforcement.

Headquartered in Fremont, California, with offices in EMEA and Asia Pacific, Procera empowers more than 600 networks and vendors worldwide.

Procera's vision is for a world in which all networks deliver exceptional, universal and seamless broadband services profitably, everywhere.

Our customers



Mobile Operators

For mobile network operators of any size, Procera provides insights and takes action to enhance the subscriber experience.



Fixed Broadband & Cable Operators

Procera solutions provide bandwidth management and enable differentiating monetization models for fixed operators around the world.



Satellite & WiFi Operators

Smart traffic management and traffic insights solutions, made possible with a virtualized deployment model, enable monetization in resource scarce networks.



Higher Education

From small to large size campus networks, Procera manages traffic for quality control and usage management.



Software Vendors (OEM)

Procera's OEM offering provides the power of DPI available to any software application in real-time.



Our business pillars

Our 3 business areas have three distinct customer groups. The Pro•ID solutions are primarily for embedding inside other software as an OEM solution. The Pro•VIEW family is virtualized and passive listening-only, designed to enrich data in CEM and big data analytics platforms managed by the operator's IT organization. The Pro•ACT solutions, besides reporting, can also impact the subscribers' experience with active traffic management and policy and charging solutions - typically managed by the CTO or Networks organisations.



Software identifying applications in data traffic, providing vendors with actionable intelligence in real-time.



Virtualized platforms adding value to Customer Experience Management (CEM) and big data analytics solutions, through structured and enriched intelligence from all data traffic.



Insights reporting, traffic management and policy enforcement for mobile and fixed broadband networks, focused on enhancing the subscriber experience.

Our Pro•ACT solution areas



Insights & Reporting

With Procera solutions, operators are empowered with deeper insights into their data traffic and get a simplified, actionable view of their network's capability to deliver quality - from a subscriber's perspective.



Traffic Management

Procera's Traffic Management solutions, including fair-split shaping functionality, are engineered to enhance the subscriber experience at a reduced cost.




Policy & Charging Control

Procera helps simplify and accelerate service creation for Mobile operators who have adopted 3GPP policy and charging control standards, as well as fixed broadband networks in need of proprietary solutions.

Use Case Index

Deep Packet Inspection (DPI) technology can be used for a diverse set of use cases. In this book we present a sample of the most popular and describe their benefits.

KEY

 **Identification focused**

 **Insights focused**

 **Action focused**



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Procera Product Map



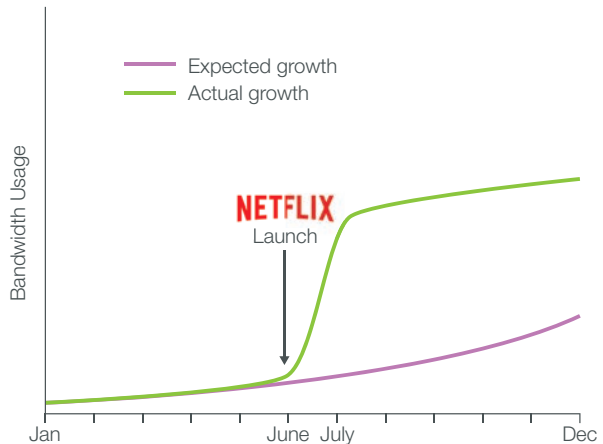
Video Traffic Management

Reducing bandwidth usage of video traffic



Over-the-top video launches and campaigns can increase traffic and put bandwidth under pressure in a short period of time. In Australia, traffic volumes remained 25% higher than normal 6 weeks after market introduction of Netflix. Network Operators need to be prepared for sudden spikes in their network utilization and be able to protect the quality of traffic for sensitive applications such as Voice over IP, to provide satisfactory quality for the majority of their customers.

In Australia, traffic volumes remained 25% higher than normal six weeks after the market introduction of Netflix.



EXTERNAL REFERENCES

The Register: Netflix to complete global roll-out, add 120+ countries by end of 2016
<http://goo.gl/4JBkKY>

Mashable: Netflix traffic on iiNet explodes to 25%, but not without headaches
<http://goo.gl/OcGKbb>

SOLUTION

Active traffic management reduces the average bit rate used per video stream, only in areas where congestion occurs. This ensures that critical communications are secured and continue to function undisturbed - with minimal impact to the video quality. Customers may experience a barely noticeable quality degradation from 1080p to 720p during the time of congestion only.



Products used in this Traffic Management solution are PacketLogic Real-time Enforcement Platform and the Congestion Management module.

IMPACT AND RESULTS

Good quality of experience is maintained for critical, sensitive services like VoIP, even under extreme data growth conditions, without significantly reducing the quality delivered to video consumers. This allows investments in network capacity to be delayed and OTT video prioritization packages to be created for those consumers requiring maximum video quality.

Good quality of experience is maintained for critical, sensitive services like VoIP

**4K
ULTRA HD**

720px



Download the video traffic management guidebook at:
<http://goo.gl/BQHwjP>



Congestion Management - Fair-split

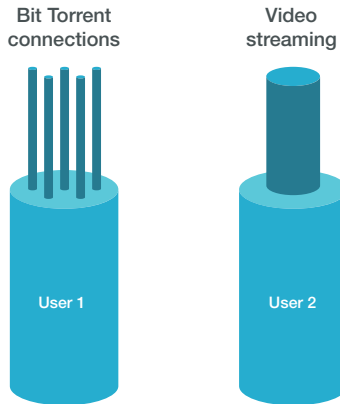
Heavy user bandwidth management



BACKGROUND

A minority of heavy-use subscribers are using an over representative amount of the overall bandwidth available. Typically this occurs when file-sharing or other applications that create multiple TCP sessions in parallel are used, with the aim of gaining maximum bandwidth. The result is that capacity is unable to be allocated fairly to regular users, causing service degradation.

Due to the different behaviours of applications, network capacity is unable to be allocated fairly, causing service degradation.



Differences in bandwidth usage caused by application behaviour

EXTERNAL REFERENCES

Ars Technica: Comcast plans data caps for all customers in 5 years, could be 500GB <http://goo.gl/jnwEzw>

Cox Communications: Billing & Account Support - Data Plan and Usage Policy <http://goo.gl/j80TTF>

SOLUTION

Active traffic management identifies heavy users and scales down their bandwidth usage. A Fair usage policy is implemented based on total volume used per month, or a more immediate time interval as decided by the Operator. Capacity is distributed fairly between subscribers regardless of how their applications behave.

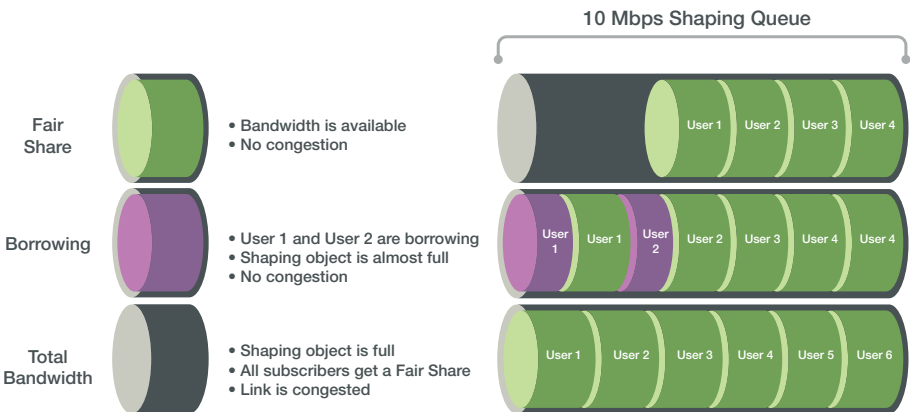


Products used in this Traffic Management solution are PacketLogic Real-time Enforcement Platform and the Congestion Management module.

IMPACT AND RESULTS

The availability of capacity for lighter users attempting to connect is secured, only marginally impacting the experience of the heavy users. Network upgrades and associated CAPEX investments can be delayed.

Network upgrades and associated CAPEX investments can be delayed.



Learn more about Traffic Management functionality on this datasheet:
<http://goo.gl/gjdco5>



Trend Monitoring

of Over-the-Top applications and services

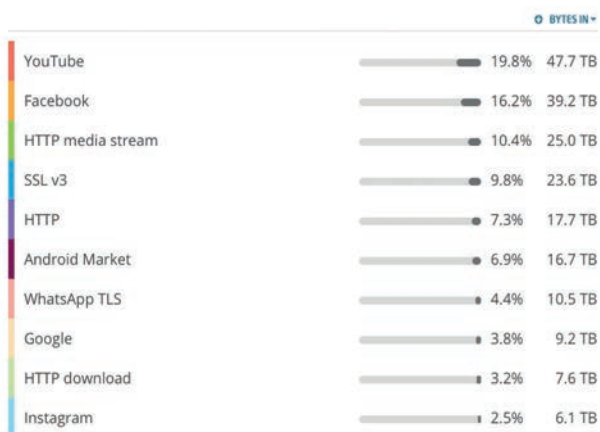


How real is the OTT revenue capitalization threat in your network?

BACKGROUND

New Over the Top applications like Viber and WhatsApp create a potential competitive threat to existing voice and sms revenues. Operators need the ability to evaluate the scale of the problem by understanding how fast the competitor's service is growing and how real the danger is to their network and customer base.

SERVICES



EXTERNAL REFERENCES

The Guardian: Vodafone urged to give free text app Viber full access to network
<http://goo.gl/N4iO9s>

Tech Radar Pro: Why network operators must embrace innovation – and OTTs – to survive
<http://goo.gl/wRnMKC>

SOLUTION

With our Insights solution, reports are created on OTT service usage which can be translated into the tangible impact of an OTT app on the network. This helps in understanding the level of threat and the OTT app's likely acceleration on your specific network, providing far more reliable analysis of the situation than trusting public trending figures from the media.

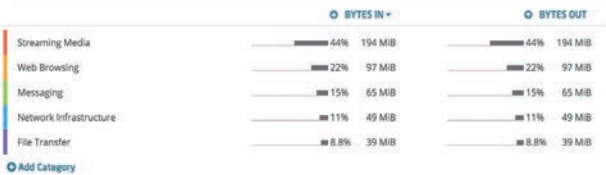


Products used in this Insights & Reporting solution are the PacketLogic Platform with Traffic Perspectives and Engineering Insights.

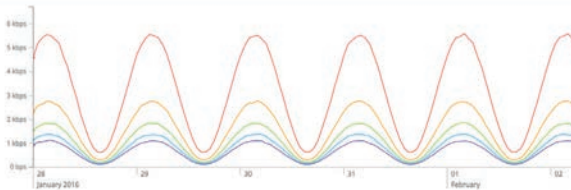
IMPACT AND RESULTS

Base your business decisions on facts rather than rumours or guesswork, and change your offerings based on what is actually relevant to your subscribers.

SERVICE CATEGORIES



DOWNSTREAM THROUGHPUT



Download the Engineering Insights datasheet here:
<http://goo.gl/WPK5iq>



Access Network Congestion Management

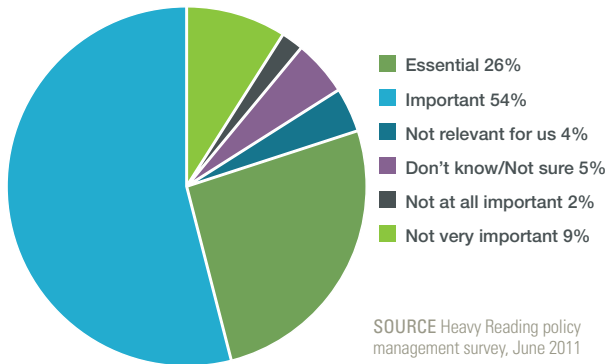
RAN and location aware traffic management



BACKGROUND

Access networks can become congested at busy times of the day or week, or even permanently congested if network expansion is delayed or not possible due to radio frequency limitations. This causes random and unpredictable outages to applications, without consideration for the sensitivity of the application to interruptions.

Respondents linking importance of Policy Management to RAN Congestion Control



EXTERNAL REFERENCES

PlusNet: Why do we manage traffic? <http://goo.gl/KSPi0c>

Heavy Reading: Controlling RAN Congestion: The Experience Is Everything
<http://goo.gl/uF2IMA>

SOLUTION

The solution is to identify the source location or cell ID for the traffic and separate High Experience traffic from Background traffic (e.g. Web surfing from Dropbox sync). A rate limit can be applied on how much throughput the background traffic can consume in order to allow other traffic to go through. In addition, video can be forced to downscale to a lower resolution, and VIP subscribers can be prioritized, specifically for the locations/cells affected by frequent congestion problems.

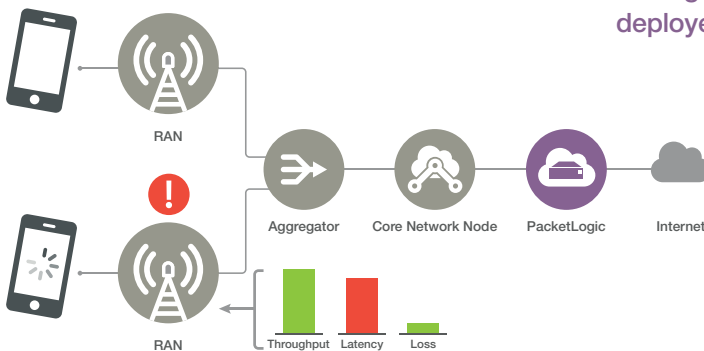


Products used in this Traffic Management solution are PacketLogic Real-time Enforcement Platform, the Subscriber Perspective, PSM Internal and the Congestion Management modules in combination with RAN Perspectives.

IMPACT AND RESULTS

This enables Operators to defer investments to upgrade or, if that is not possible, maintain a good experience for users in identified congested/problem areas.

Maximize the RAN investment with Location Aware Congestion Management deployed in the core.



Download the White Paper about Location Aware Quality Management:
<http://goo.gl/IMJgjX>



Capacity Planning

Just-in-time network planning for capacity growth



BACKGROUND

Effective Capacity Planning requires granular detail of what is happening in your network. Multiple layers of data are needed to build up the most accurate picture to ensure the best deployment of new resource and infrastructure. Understanding traffic growth per sub-section and layer of the network is challenging, but critical when planning capacity upgrades.

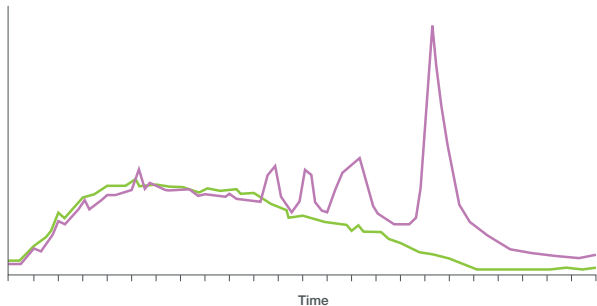
Network usage is not evenly spread - trend monitoring can predict what area needs upgrading first.



E·INSIGHTS

Empowered by PacketLogic™

Data Usage Comparison Line - Customers
Throughput



EXTERNAL REFERENCES

KPN: “4G ... increased data usage which is between 2.5 and 4 times higher than 3G usage.” <http://goo.gl/oElab4>

Mashable: Netflix traffic on iiNet explodes to 25%, but not without headaches <http://goo.gl/OcGKbb>

SOLUTION

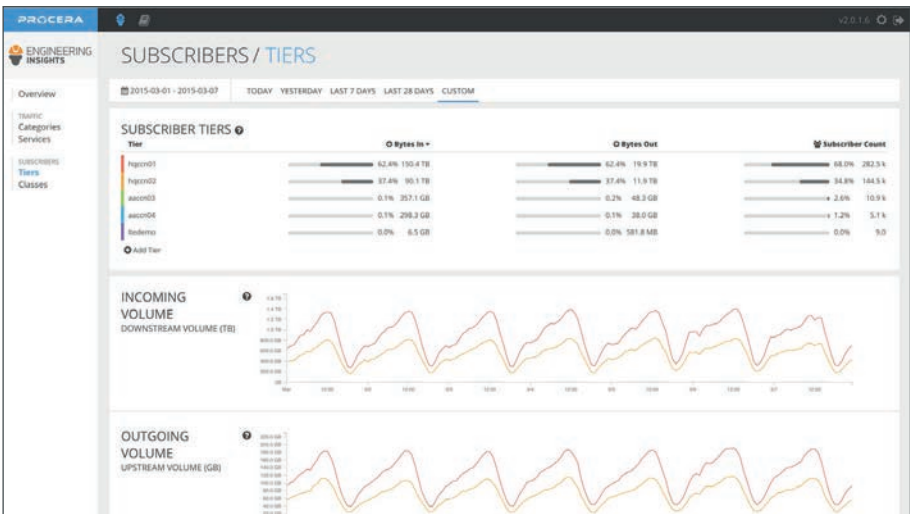
Operators can use Engineering Insights with Route & Topology Perspectives, providing utilization and trend reporting, split per application type, to forecast investment needs accurately.



Products used in this Insights & Reporting solution are the PacketLogic Platform with Route & Topology Perspective and Engineering Insights.

IMPACT AND RESULTS

Optimize infrastructure investments by delaying CAPEX spend. Informed decision making with intelligent data rather than guesswork.

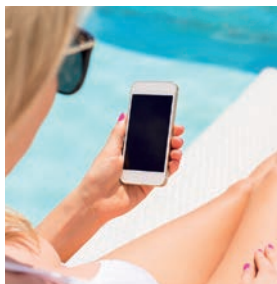


Download the Engineering Insights datasheet here:
<http://goo.gl/WPK5iq>



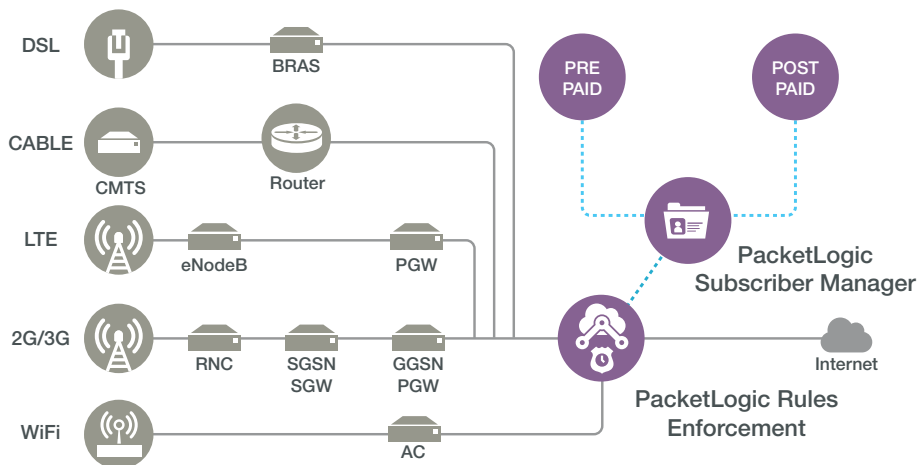
Flexible Subscriber Quota Management

Differentiated billing based on traffic intelligence



BACKGROUND

Operators need to differentiate themselves with service packaging to stay ahead of the competition from Over-the-Top players. Applications need to be separated into different data buckets and counted to different quotas. At the same time, fixed and mobile networks are converging and in converged environments, an integrated solution is required in order to offer data packages on both 3GPP and non 3GPP networks.



EXTERNAL REFERENCES

CNET: Cable goes for the quadruple play <http://goo.gl/iYyoPf>

Gigaom: Want Skype on your mobile phone? Swedes will have to pay <http://goo.gl/XxwgmU>

SOLUTION

Procera Subscriber Manager allows operators to package individual services and service types, map them towards bundles and count the usage of each. As a result, highly tailored services can be offered that are relevant to subscribers' needs. The Procera Real-time Enforcement

engine is used to enforce the policies in any broadband network, both 3GPP compliant and those working in other standardization environments, such as cable or other fixed networks.

Subscriber	Service Bundle	Quota
Gold - Post-Paid	Data	10 Gig
	VoIP	1 Gig
	Messaging	Unlimited
Pre-Paid	Data	5 Gig
	VoIP	Blocked
	Messaging	-



Products used in this Policy & Charging Control solution are PacketLogic Real-time Enforcement Platform, Subscriber Perspectives and the PSM Internal modules together with Congestion Management, Filtering and Advanced Traffic Steering.

Differentiate service offerings across networks with flexible bundles based on subscriber and network intelligence.

IMPACT AND RESULTS

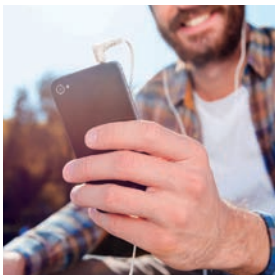
Operators are able to bring differentiated offerings to market with confidence, and apply the same service policies to their mobile and fixed access offerings.

Download the Case Study about how Yoigo used quota management with DPI to create differentiating offerings on a challenging market.
<http://goo.gl/U7q0Vm>



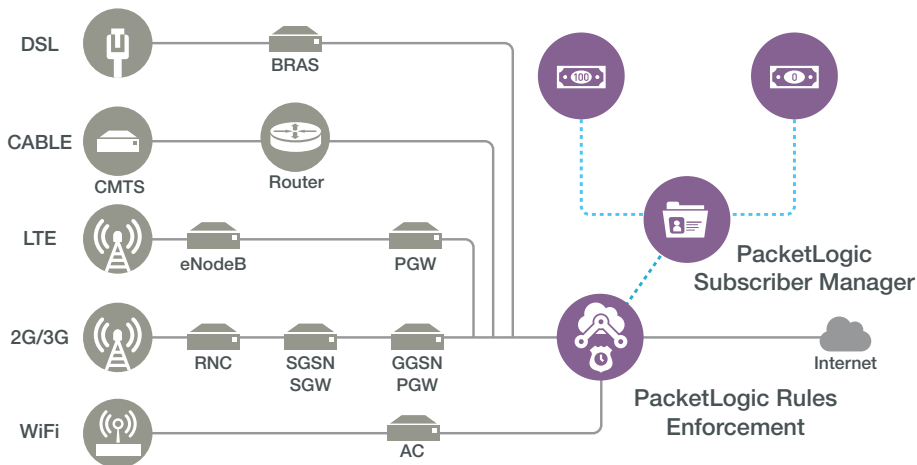
Application specific Zero Rating

Differentiated offerings co-operating with OTT



BACKGROUND

Operators can separate Over-The-Top Applications or other services, and create separate rating information accordingly. For example, to differentiate their offerings, an Operator may want to provide free access to streaming media to all their post paid subscribers. Other examples include removing charges for any surfing of Facebook and partnering internet.org companies, or removing usage monitoring for video traffic below a certain bit rate.



EXTERNAL REFERENCES

T-Mobile USA: T-Mobile Unleashes Mobile Video with Bing On™
<http://goo.gl/KSPi0c>

Internet.org: Free Basics: Myths and Facts <https://goo.gl/RBN8dr>

SOLUTION

With Procera's PacketLogic Deep Packet Inspection (DPI) solution deployed in the network, the operator will be able to separate traffic. With up to date DPI the solution is capable of identifying the streaming services' traffic and create separate data records on usage to be forwarded to billing. However, traffic detection is often more complex than it seems at first. For instance, a music service is more than just streaming audio traffic; there is a login and validation process, play-list downloads, album cover graphics, etc., all of which need to be included and counted to make the music service work.



Spotify's service is audio, plus login plus playlists plus album artwork.



Products used in this Policy & Charging Control solution are PacketLogic Real-time Enforcement Platform and the Subscriber Perspectives and Congestion Management module together with CDR generation. For URL based zero rating Content Perspectives must be added.

A music service is much more than streaming audio traffic alone.

IMPACT AND RESULTS

With a Deep Packet Inspection solution to Zero-Rating, the operator can successfully rate all traffic that belongs to a service, not the media alone, towards the zero-price-plan. The accuracy will be greater and with weekly signature updates, operators can be assured to be up to date. For the operator this means unique differentiated offerings in the market.

Download the datasheet on Policy and Charging Control solutions:
<http://goo.gl/tnweYg>



Big Data Feed

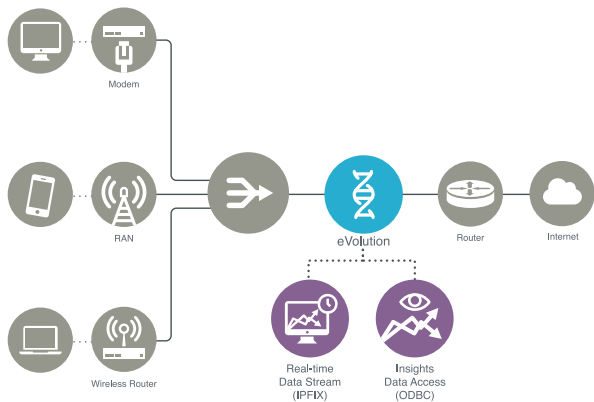
Insights into customer behaviour



Real-Time access to structured data can transform an operator's ability to engage subscribers with value-added offerings and enhanced subscriber experience

BACKGROUND

Network operators worldwide are looking to gain insights into the experience that they are delivering to their subscribers. Many operators are turning to Big Data solutions to gather more intelligence on what is happening on their networks. They are looking to increase revenue, reduce OPEX, increase customer loyalty through targeted offerings, enhance the overall customer experience, simplify business operations, reduce churn, reduce time to market for new services, and accelerate the creation of personalized services.



The product used in this Pro·VIEW solution is eVolution together with one or several data export modules. Procera offers real-time IPFIX interfaces or access to prepared data with ODBC.

SOLUTION

The eVolution data collection probe is deployed on COTS hardware in a fully virtualized environment supporting common virtualization and NFV technologies. The collection can take place anywhere in the network, at the edge of the network, in the core, or at the peering point. The solution provides detailed patterns of usage behaviour per individual subscriber, and enriches this with marketing relevant contexts such as “content category”, “customer segment” and “location”, depending on the Perspectives installed. This data is fed to an action engine in real-time, using industry standard formats like IPFIX, to make an up-sell proposition.



eVolution is empowered by Procera's industry-leading PacketLogic technology, including the DRDL signature database that is updated weekly.

IMPACT AND RESULTS

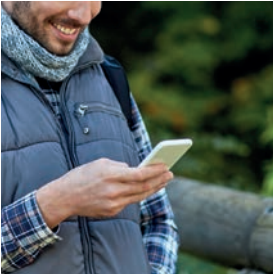
Operators are able to monetize their data and analytics intelligence to generate new revenue through targeted offerings. eVolution can be integrated with existing OSS/BSS systems for real-time use cases and Big Data systems for historical use cases so that CEM solutions can benefit from the best insights into the data traffic in order to truly understand customer behaviours, preferences and quality experienced.

Download the White Paper “The eVolution of data enablement: virtualized and in real-time”: <http://goo.gl/C1ZDWs>



ScoreCard

Reveal your network's capability to deliver subscriber experience



BACKGROUND

All CTOs want to see what actual quality the network is delivering, across multiple areas: service, application, geography and subscriber. These data splits with comparisons over time are necessary to build up a true picture and justify CAPEX spend.



Network KPIs can no longer show the complete picture, a subscriber and application perspective is needed.



EXTERNAL REFERENCES

LightReading Webinar: “Network KPIs can no longer show the complete picture” - Basem Temraz, Senior Manager, Network Development and Operations, du.
Watch the Webinar recording here: <http://goo.gl/DtSjWT> (registration required)

The Irish Times: Cantillon: Is the Netflix broadband speed index worth watching?
<http://goo.gl/QHq7SQ>

SOLUTION

ScoreCard presents the quality of experience to be expected from the network at any given time, from specific application categories (Voice, Data, Video) and provides break downs by location, device, topology or subscriber, to identify bottlenecks and see where to invest for improvement.



Products used in this Insights & Reporting solution are the PacketLogic Platform with Score Perspectives and Engineering Insights.



Web Surfing

Scores C. Experience impacted by network quality. Did you know, 3% of Packet Loss doubles the page-load times?



Streaming Video

Scores A. With very high throughput available this network is ready for HD and even 4K streams! Is yours?



Social Media

Scores D. Latency is severely effecting the interactive experience of social messaging.



Real-time Gaming

Scores F. Due to the high latency gaming is not viable. DSL is much better suited than Cable for Real-Time gaming.



Upload

Scores B. With continuous good throughput large email attachments are send in a snap. Did you know, the average smartphone photo is 6 MB?



Download

Scores C. Expectations are higher and simultaneous downloads happen more frequently than uploads.



Voice Applications

Scores B. Great conversation quality. Modern voice applications are not that sensitive to packet loss, but benefitting from a stable consistent latency.

Reveal the network's score and show the capability to deliver quality from the subscribers' perspective.



IMPACT AND RESULTS

Cost efficient investment to improve the network and subscriber experience. See the actual quality being delivered by the network and analyze the improvements following upgrades. Break down the scores in perspectives such as location, subscriber tier or topology, each described on the following pages.

Watch the ScoreCard video and download the Case Study document here: <http://goo.gl/sxCyBa>



ScoreCard - Drill Down

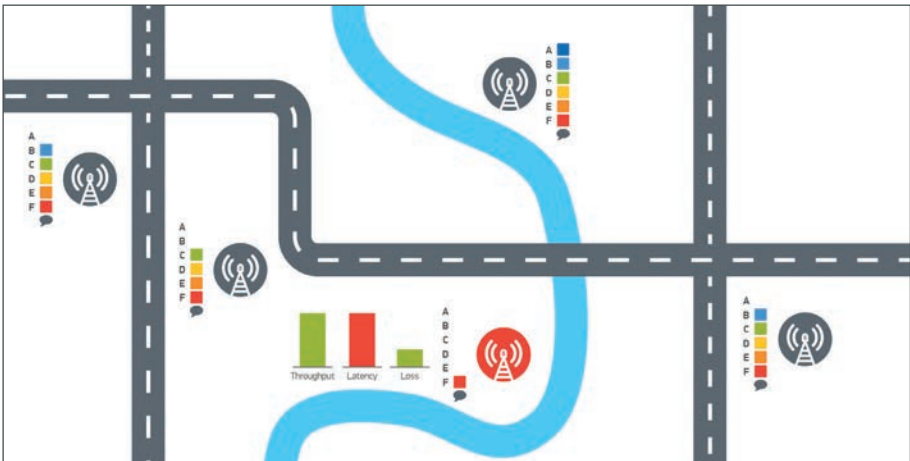
Identifying impact of RAN congestion in a mobile network with location perspective



BACKGROUND

With ScoreCard, operators can quickly determine if their network is delivering a good experience for the applications that drive subscriber usage. However, drill down is needed to reveal the root cause of a lower than expected score and enable action. A break down by traffic origin location, such as the Cell ID in the RAN network, can reveal differences in quality delivered by different parts of the network.

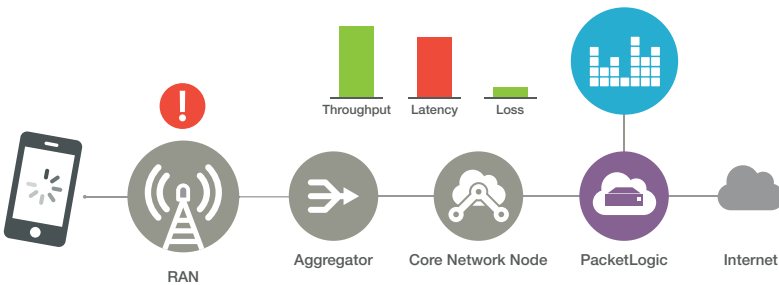
SCORECARD



This picture shows ScoreCard per Cell in a Mobile network. One cell is performing significantly worse than others, scoring an F on Social Media. The root-cause of this is high latency, caused by RAN packet retransmissions.

SOLUTION

Location Perspective breaks down the scores per area where the subscriber is located. This can be a geographical area in a fixed network or a Cell ID in a mobile network. Viewing the score per Cell ID identifies poor performing cells. A drill down can show that there is high latency in this particular cell, far more than in others. This is caused by packets being retransmitted in the Radio Access Network. This procedure adds delay in the overall session delivery, pointing to congestion in the cell. If the links had shown packet loss instead, it would mean that the packet would have been retransmitted, revealing that the back-haul link is the problem.



Products used in this Insights & Reporting solution are the PacketLogic Platform with Score Perspectives, Location/RAN Perspectives and Engineering Insights.

Drill down per location to reveal the root cause of an application's low score.

IMPACT AND RESULTS

Procera's ScoreCard enables operators to enhance their subscribers' experience. By adding location perspectives, quality of experience data becomes immediately actionable, so that operators can prioritize their investments to achieve maximum return on investment.

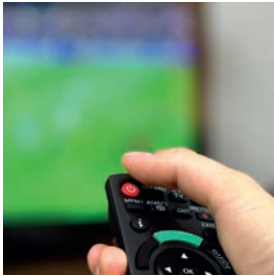


Watch the ScoreCard Use Case video and learn more here:
<http://goo.gl/7grzpT>



ScoreCard - Drill Down

Understanding video quality in a fixed network with subscriber perspective

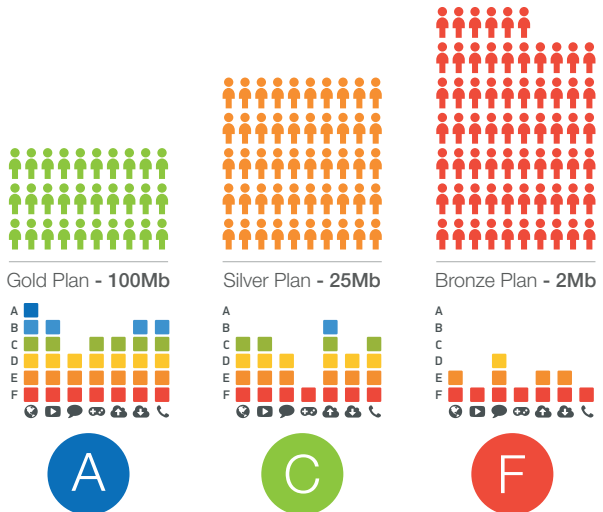


BACKGROUND

Understanding how different segments of your subscriber base are experiencing their services is critical to being proactive on complaints. It will also drive to a sharper and more valuable pitch for upsell proposition, as you can target the users who will enjoy the benefits of an upgrade.

SCORECARD

This picture shows ScoreCard per Subscriber Group. One group is performing significantly worse, particularly on streaming video. The root-cause of this the low throughput caused by configuration of the subscription tier. An upsell campaign is the first approach to move OTT video users to a Silver plan instead.



SOLUTION

ScoreCard with Subscriber Perspectives allows the break down of scores into any groups of subscribers defined by the operator. Data is saved on a per subscriber basis, so new groups can be formed dynamically, discovering new segments and user trends. A typical configuration would include Tiers as well as specific VIP and Corporate users.



Products used in this Insights & Reporting solution are the PacketLogic Platform with Score Perspectives, Subscriber Perspectives and Engineering Insights.

IMPACT AND RESULTS

ScoreCard visualizes the impact on the subscriber experience with clear figures on the number of customers affected. The problem is isolated to a specific set of nodes and can therefore be fixed quickly. ScoreCard will display the impact the improvements have made on Subscriber Experience.

Dynamically discovering new segments and trends by defining new groups and revealing their quality score.



Watch the ScoreCard Use Case video and learn more here:
<http://goo.gl/1FJ9V>



ScoreCard - Drill Down

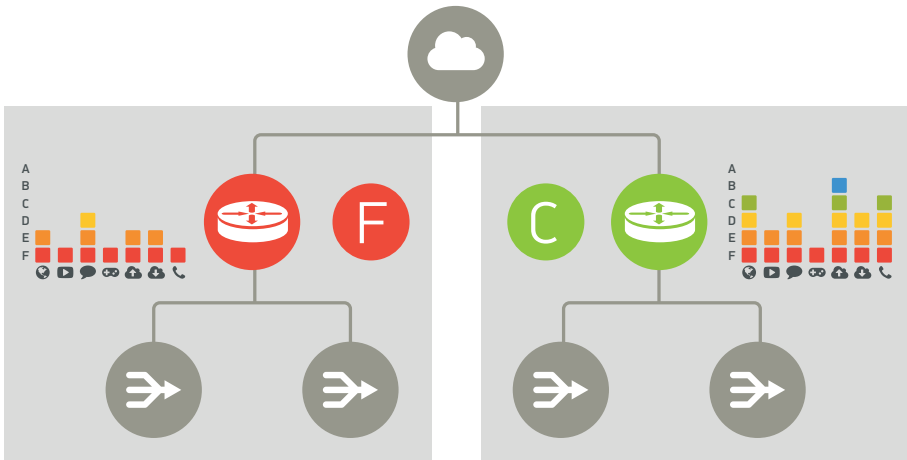
Understand subscriber experience during peak hours in specific areas of the network



BACKGROUND

How does a Network Operations Center know what quality is delivered everywhere in the network? Typically KPIs will only show on equipment levels, or on the overall traffic, missing typical load balancing problems, configuration issues and quality degradations in less trafficked areas of the network.

SCORECARD



This picture shows ScoreCard per sub section of the network as defined in a Topology view. It is clear that Subscribers behind the left section of the network are unhappy, while the traffic on the right is flowing with normal quality. A breakdown of scores is needed as traffic volumes per area can differ significantly, hiding the true quality of experience.

SOLUTION

ScoreCard presents the quality with break down into a Topology Perspective. In this way, the quality delivered will be shown in virtual groups of subscribers sharing the same network resources.



Products used in this Insights & Reporting solution are Score Perspectives, Topology Perspective and Engineering Insights.

ScoreCard visualizes the impact on the subscriber experience with clear figures on the amount of customers affected.

IMPACT AND RESULTS

During busy times, ScoreCard is showing that one area of the cable network (topology wise) has poor Web Surfing experiences, rating a D. This is caused by the high amount of packet loss in that area of the network. The Video Streaming service is still providing a B as the packet loss is not severe enough to impact the video play out buffer. Gaming is receiving an F as it is severely impacted by the network.

Drill down into the area indicates that there is likely congestion on links that are configured with a small queue size. If the queue was large, a significant delay would have been introduced. The total throughput from an area in the topology can be read indicating that a load balancing scenario misconfiguration is likely. ScoreCard visualized the impact on the subscriber experience with clear figures on the amount of customers affected. The problem is isolated to a specific set of nodes and can therefore be fixed quickly. ScoreCard will display the impact improvements have made on Subscriber Experience.



Watch the ScoreCard Use Case video and learn more here:
<http://goo.gl/HH500P>



Network Troubleshooting

Real-time network traffic forensics



BACKGROUND

Network operators need to be able to troubleshoot real-time data traffic based on customer support complaints.

A solution is needed that provides drill down to single sessions from within all data traffic in real-time, while maintaining contextual subscriber association and providing fully customizable traffic filters.

Networks are complex and troubleshooting is hard - if not impossible - without the right tools.

The screenshot displays a network monitoring application window titled 'PacketLogic - v15 - v15.0.demo.proceeranetworks.com'. The interface includes a sidebar with navigation options like 'Local Hosts', 'Social Hosts', 'Services', 'Categories', 'Shaping Objects', 'Filtering Rules', 'Filtering Log', 'FlowLog', and 'Channel Statistics'. The main area shows a hierarchical tree view of traffic sources, including 'All Subscribers', 'By APN', 'By Device', and 'By Geography'. A detailed table is visible, listing various traffic flows with columns for Name, Incoming, Outgoing, Ingoing CPS, Outgoing CPS, Connections, Unset Connections, In Quality, and Out Quality. The table data is as follows:

Name	Incoming	Outgoing	Ingoing CPS	Outgoing CPS	Connections	Unset Connections	In Quality	Out Quality	In Quality %	Out Quality %
PSM	15.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
Cable	18.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
Mobile	15.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
All Subscribers	15.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
By APN	15.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
By Device	15.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
Apple	1,010.3 kbps 1,027.1 kbps	3.0	43.0	1,200.0	766.0	95.0 %	100.0 %	100.0 %	60.0 %	60.0 %
iPhone 3GS	0 bps	0	0	5.0	4.0					
iPhone 4	315.4 kbps 723.0 kbps	2.0	28.0	1,023.0	470.0	80.0 %	100.0 %	100.0 %	66.0 %	66.0 %
iPhone 4S	811.3 kbps 284.0 kbps	1.0	16.0	249.0	277.0	99.0 %	100.0 %	100.0 %	87.0 %	87.0 %
iPhone 5	3,456.0 bps 50.1 kbps	0	0	28.0	15.0	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
15555167908379	3,456.0 bps 48.6 kbps	0	0	3.0	13.0					
15555167908501	0 bps	0	0	0	8.0					
15555167908424	0 bps	0	0	0	2.0					
15555167908208	0 bps 80.0 bps	0	0	2.0	1.0					
15555167908703	0 bps	0	0	0	1.0					
15555167908491	0 bps	0	0	0	3.0					
15555167954969	160.0 bps 392.0 bps	0	0	9.0	1.0	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
HTC	488.7 kbps 860.5 kbps	0	3.0	375.0	215.0	92.0 %	100.0 %	95.0 %	85.0 %	85.0 %
Huawei	1,203.9 kbps 364.9 kbps	0	9.0	409.0	424.0	94.0 %	99.0 %	97.0 %	65.0 %	65.0 %
LG Electronics	3,461.4 kbps 1,108.9 kbps	0	5.0	557.0	686.0	97.0 %	100.0 %	100.0 %	94.0 %	94.0 %
Motorola	1,318.8 kbps 436.1 kbps	0	14.0	381.0	257.0	100.0 %	99.0 %	100.0 %	97.0 %	97.0 %
Nokia	1,761.4 kbps 1,011.8 kbps	1.0	17.0	973.0	422.0	99.0 %	99.0 %	100.0 %	98.0 %	98.0 %
PalmOne	1,468.1 kbps 141.0 kbps	0	6.0	310.0	117.0	93.0 %	97.0 %	97.0 %	92.0 %	92.0 %
RM	812.0 kbps 622.4 kbps	2.0	13.0	428.0	686.0	91.0 %	100.0 %	96.0 %	72.0 %	72.0 %
Samsung	1,945.1 kbps 259.7 kbps	0	2.0	682.0	120.0	99.0 %	100.0 %	100.0 %	95.0 %	95.0 %
Siemens	805.9 kbps 607.2 kbps	0	0	669.0	119.0	100.0 %	100.0 %	100.0 %	87.0 %	87.0 %
Sony Ericsson	1,884.3 kbps 308.5 kbps	8.0	92.0	1,300.0	919.0	97.0 %	99.0 %	99.0 %	83.0 %	83.0 %
XDA	7,056.0 bps 6,496.0 bps	0	0	81.0	19.0	100.0 %	83.0 %	100.0 %	87.0 %	87.0 %
ZTE	170.9 kbps 172.9 kbps	0	18.0	118.0	123.0	100.0 %	100.0 %	100.0 %	89.0 %	89.0 %
By Geography	13.8 Mbps 5,381.2 kbps	16.0	206.0	6,200.0	4,093.0	95.0 %	99.0 %	99.0 %	80.0 %	80.0 %
Boston	3,009.0 kbps 2,421.4 kbps	5.0	68.0	2,249.0	1,112.0	97.0 %	99.0 %	100.0 %	93.0 %	93.0 %
Miami	6,803.0 kbps 1,781.2 kbps	0.0	111.0	2,190.0	1,842.0	91.0 %	99.0 %	99.0 %	62.0 %	62.0 %
Orlando	3,942.4 kbps 1,178.6 kbps	1.0	25.0	1,761.0	1,339.0	96.0 %	99.0 %	99.0 %	66.0 %	66.0 %
By COGN	16.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
By MCC-MNC-COGN	16.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
SubscriberCounters	16.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %
SubscriberCounters	16.0 Mbps 7,068.4 kbps	17.0	227.0	7,348.0	4,753.0	95.0 %	99.0 %	99.0 %	81.0 %	81.0 %

SOLUTION

LiveView within the Procera solution is able show all traffic in real-time, providing a powerful tool to the network engineer in order to troubleshoot any suspicious traffic. Using LiveView, engineers can build a specific view to filter out application traffic, such as Gmail, and monitor it in real-time to get to the root of a problem. They can single out one flow that is failing and another that is working, to spot that they are routed over different AS paths.

To get a measure of the size of the problem, engineers can set up logic in LiveView to summarize the connection attempts to Gmail split by AS path, indicating that there are a large number of connection attempts failing via one specific peering partner.



Products used in this Insights & Reporting solution are the PacketLogic Platform and the LiveView tool.

Quickly sort and view top services running on the network and then drill down into connection details.

IMPACT AND RESULTS

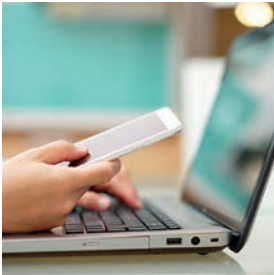
Solve network problems quickly and reduce resolution time on support trouble tickets with real-time access to all data in the network. With LiveView, engineers can drill-down to individual subscriber YouTube flows, to individual subscriber iMessage flow to see messages sent/received (estimate), or breakdown Google URLs by type, to analyze SPDY usage - all details are shown in real-time.

To request a demo of LiveView and its powerful capabilities submit a request here: www.proceranetworks.com/demo



Cost Efficient Peering Management

Differentiated traffic shaping



BACKGROUND

Peering links can be one of the most challenging CAPEX costs to manage. Optimizing the use of these high value links is more important than ever. Once an operator gains the insights on what traffic is running over which links, use of those links can be optimized through traffic management, prioritization, caching or expanded CDN partnerships.

Procera's PacketLogic solutions enable efficient use of existing bandwidth based on subscribers, service groups, applications, content, usage or time of day.

SOLUTION

Network operators need to understand where their high value subscriber traffic is coming from, what type of traffic it is, and the quality of experience their subscribers receive across those peering links. Procera's PacketLogic peering integration capabilities provide unparalleled visibility into the activity on peering links in real time and historically have helped operators make the right CDN, caching, and peering relationship decisions.

With Traffic Management strategies, Shaping Rules can be applied to specific traffic flows, managing costs and quality of the overall peering traffic.



Products used in this Traffic Management solution are PacketLogic Real-time Enforcement Platform together with Route Perspectives and the Filtering and Congestion Management modules.

IMPACT AND RESULTS

Direct return of investment by reducing peering costs, but more importantly the operators now have the ability to manage the experience of each user and balance this towards the costs.

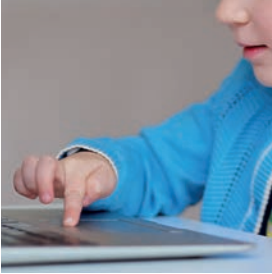
Procera's PacketLogic capabilities provide unparalleled visibility into the activity on peering links and allow real-time action to control costs.

To read more about Traffic Management strategies download this paper here: <http://goo.gl/gjdco5>



Regulatory Compliance - Traffic Blocking

Preventing service or site access



BACKGROUND

Many countries around the world have legally binding restrictions on what services local subscribers may access, or what sites are openly accessible. It may be required to block Voice over IP applications, or restrict access to adult material or file sharing resources. In some areas even VPN services are subject to limitations. These rules may be personalized (on/off per user), or be different between subscriber segments (residential/corporate).

EXTERNAL REFERENCES

Electronic Frontiers: Internet Censorship: Law & policy around the world
<https://goo.gl/6glfic>

Internet Business Law Services: Internet telephony is illegal throughout the Middle East <https://goo.gl/LJD0Sj>

SOLUTION

Procera's solutions provide the capabilities to identify and block, or shape down to become unusable, any identifiable service network wide or on an individual subscriber basis.

As an example, adult content can be opted in on an individual bases or services like Skype could be enabled for corporate clients only. Procera updates it's signature database on a weekly basis to stay up to date on changes in what traffic looks like. Blocking proprietary over-the-top services will always remain a cat and mouse game that requires local dedicated personnel to perform well. Procera can provide these resident engineering services.



Products used in this Traffic Management solution are PacketLogic Real-time Enforcement Platform and the Congestion Management and Filtering modules in combination with Content and Subscriber Perspectives.

Personalized service restrictions are possible to meet legal requirements and subscriber preferences.

IMPACT AND RESULTS

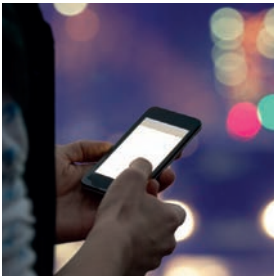
In many countries there are laws that require this kind of Regulatory Compliance. Procera provides an effective and cost efficient way to comply, while at the same time providing a wide range of other Use Cases.

To read more about Content Perspectives download this datasheet here: <https://goo.gl/d8IAQC>



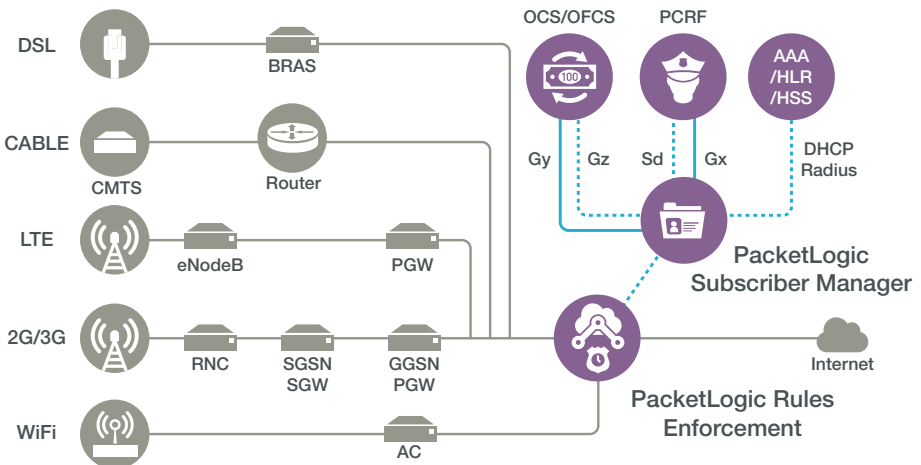
PCC enforcement with Gx & Gy Integration

3GPP compliant PCEF for traffic steering



BACKGROUND

In order to really differentiate with a policy or charging solution, a policy enforcement point with true deep packet inspection capabilities is needed. This enables Operators to differentiate their service packaging by separating out the Over-The-Top services and applications as well as enabling enforcement for more simple usage counting needs.



Gx – Supported

Gy – Supported

Gz – CDR format is supported with FTP transport

Sd – Planned in roadmap

SOLUTION

Procera's solution is 3GPP compliant and tested and deployed with many 3rd party vendors of PCRF or OCS solutions. The solution acts as a PCEF to manage, steer, shape, optimize or otherwise alter the traffic. The Subscriber Manager supports the following integrations:

- Gy for OCS and CDRs for OFCS
- Gx for PCRF
- Other methods (RADIUS/CDRs) used for subscriber policy management and charging integration.

The charging action covers byte and time accounting for subscriber traffic with integration interfaces to external systems. Integration with a PCRF or OCS to implement enforcing strategies set by those systems is done through Gx and Gy. Procera provides a scalable solution that with high performance, enables operators to implement charging rules and policies on application and services level.

Differentiate with service creation by using deep packet inspection for policy rules enforcement solutions.



Products used in this Policy & Charging Control solution are PacketLogic Real-time Enforcement Platform and Subscriber Perspectives together with Congestion Management, Filtering, Advanced Traffic Steering and Gx, Gy integration.

IMPACT AND RESULTS

Customers get higher granularity of data package offerings, in a transparent way, for both fixed, mobile and WiFi networks.

Download the White Paper about Policy and Charging Control:
<https://goo.gl/tnweYg>



Traffic Identification

Make smarter appliances with a Layer 7
DPI engine for application visibility



BACKGROUND

Network equipment vendors in telecoms and enterprise markets need to better understand who is going to which web sites, using which applications and when. This helps provide proper alignment of network resources with business priorities and ensures a high quality experience for all users.

SOLUTION

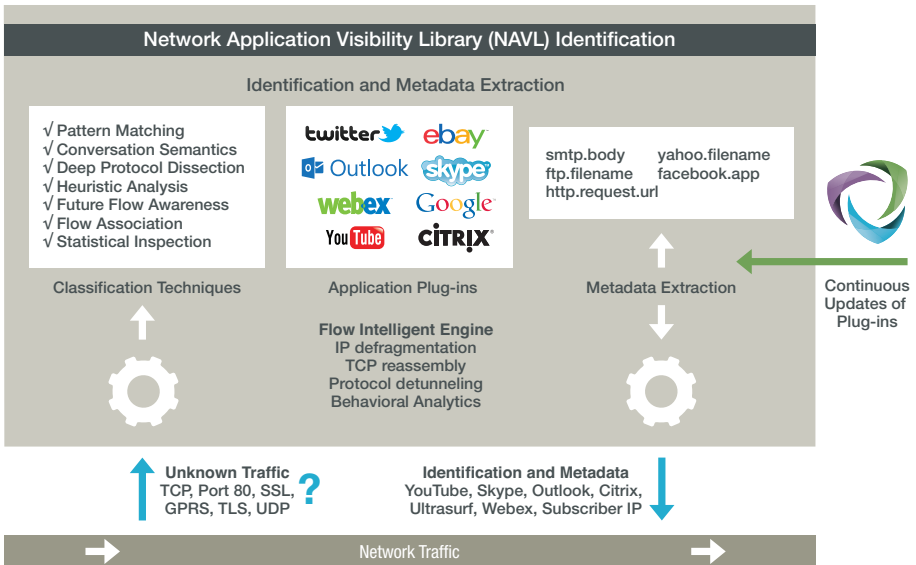
The Procera Network Application Visibility Library (NAVL) is a true layer 7 DPI technology for application identification and metadata extraction. It is delivered as an OEM software development kit (SDK) to dramatically reduce the time, cost and complexity of adding DPI technology and application intelligence to your product.



The product used in this Pro•ID Use Case is NAVL, the Network Application Visibility Library offered by Procera as an OEM-able module for software vendors.

To provide visibility into Layer-7 traffic, NAVL employs a variety of highly sophisticated identification techniques, including the following:

- Pattern Matching
- Conversation Semantics
- Deep Protocol Dissection
- Behavioural and Statistical Analysis
- Future Flow Awareness and Flow Association



IMPACT AND RESULTS

Traffic identification results are returned as an application stack that can contain both application IDs and application specific attributes. An extensive list of metadata elements can be accessed, including details related to application content type, user information, application performance, VoIP quality and video quality.

To see a video about NAVL and get more information go here:
<https://www.proceranetworks.com/deep-packet-inspection>

Platforms



PACKETLOGIC™

PacketLogic is the software platform on which our solutions are based. It includes 15 years of investment in our traffic identification engine – DRDL – enabling best-in-class application identification. By being distributed and scalable, PacketLogic is engineered to drive insight, intelligence and action for our customers to make informed decisions and take powerful actions on their data traffic.



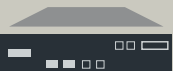
PACKETLOGIC 7000 PLATFORMS

Up to 5 Gbps subscriber experience intelligence and policy enforcement for broadband networks. Packaged in a 1U appliance it has a maximum capacity of 11 1GbE channels and handles 100,000 connections per second.



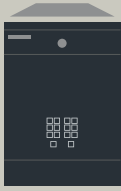
PACKETLOGIC 8000 PLATFORMS

Scalable subscriber experience intelligence and policy enforcement for broadband networks providing up to 70 Gbps throughput on 24 GbE or 12 10GbE channels. Handles 3 million subscribers and 400,000 connections per second depending on configuration.



PACKETLOGIC 9000 PLATFORMS

Ideally suited for service provider network deployments supporting high density subscriber scenarios in a cost-effective, energy efficient appliance footprint. With 120 Gbps throughput on 32GbE or 16 10GbE channels, it supports up to 3 million subscribers.



PACKETLOGIC 20000 PLATFORM

Designed for the most demanding network deployments, the PL20000 platform offers the performance and capacity to handle up to 10 million subscribers delivering Subscriber Experience Intelligence and many different personalized services in a policy enforcement configuration. The system supports 600 Gbps throughput on 36 x 10GbE and 4x 40GbE or 4 x 100GbE and 8 x 10GbE with 4 million connections per second serving 10 million subscribers.



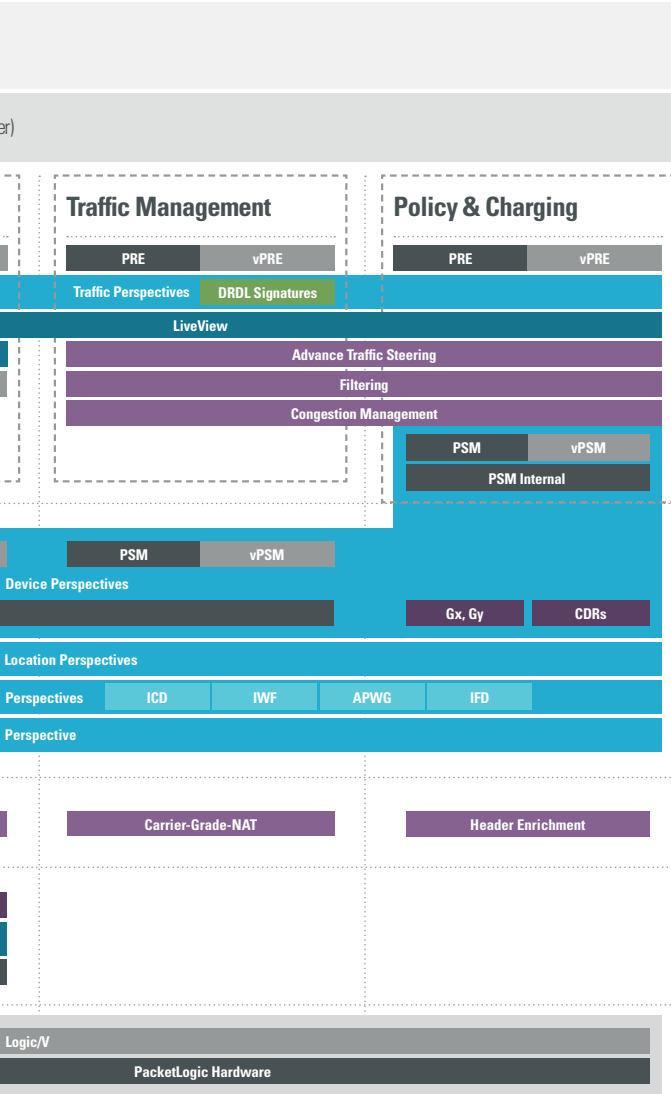
PACKETLOGIC/V

PacketLogic/V enables flexible deployments of Procera PacketLogic solutions using high performance COTS hardware environments and software virtual machine environments. Components run as individual Virtual Network Function Components (VNFC) that are part of an ETSI-defined Virtual Network Function (VNF) environment. Procera provides all use cases in virtualized form with no feature or performance compromise. A 2 rack unit COTS server has been tested to run up to 155 Gbps throughput on 4 channels. Operators can achieve greater flexibility and hardware independence with this virtualized deployment option.







Platform	# Rack Units	# Interfaces	Throughput
PacketLogic 7000	1	11GbE	5 Gbps
PacketLogic 8000	2	24GbE or 12 10GbE	24 Gbps
PacketLogic 9000	2	32GbE or 16 x 10GbE	120 Gbps
PacketLogic 20000	14	36 x 10GbE and 4 x 40GbE or 4 x 100GbE and 8 x 10GbE	600 Gbps
PacketLogic/V	-	As many as supported by COTS Hardware	155 Gbps

Product Map

















SOLUTIONS	PRO·ID	PRO·VIEW	PRO·ACT
PERSONA	Development Manager (OEM)	Service Provider CIO (Big Data Analytics Owner)	Service Provider CTO (Network Owner)
CONTENT	<p>NAVL</p> <p>NAVL</p>	<p>eEvolution</p> <p>vPRE</p> <p>Traffic Perspectives DRDL Signatures</p> <p>LiveView</p>	<p>Insights & Reporting</p> <p>PRE vPRE</p> <p>Statistics</p> <p>PIC vPIC</p>
ADD-ON PERSPECTIVES		<p>vPSM</p> <p>PSM vPSM</p> <p>Subscriber & PSM Monitor Only</p> <p>Route, Topology / Content Score</p>	
ADD-ON ACTIONS		IPFIX	
ADD-ON VISUALS		<p>Insights Data Access</p> <p>Engineering Insights ScoreCard</p> <p>Insights Storage</p>	
PLATFORM	Empowered by PacketLogic™	Packet	Packet



Map Key

-  **Base Packaging**
-  Signature Libraries
-  Perspectives
-  Visualization
-  Integrations/Actions
-  Platforms

Abbreviation Descriptions

-  **DRDL** Datastream Recognition Definition Language
-  **NAVL** Network Application Visibility Library
-  **ICD** Internet Content Database
-  **IWF** Internet Watch Foundation Database
-  **APWG** Anti Phishing Work Group
-  **IFD** Internet Filtering Database
-  **IPFIX** Internet Protocol Flow Information Export
-  **Gx** Diameter interface between Procera and 3rd party Policy server
-  **Gy** Diameter interface between Procera and 3rd party Online Charging server
-  **CDRs** Call Detail Records
-  **PRE** PacketLogic Realtime Enforcement
-  **PSM** PacketLogic Subscriber Manager
-  **PIC** PacketLogic Intelligence Center
-  **vPRE** virtual PacketLogic Realtime Enforcement
-  **vPSM** virtual PacketLogic Subscriber Manager
-  **vPIC** virtual PacketLogic Intelligence Center

ABOUT PROCERA NETWORKS

Procera Networks engineers software that identifies applications in data traffic to drive insights, provide intelligence and enable action in real-time.

Procera's PacketLogic platform with deep packet inspection, provides more value from data traffic in mobile and fixed broadband networks by bringing structure and data enrichment to intelligence from all broadband traffic. Solutions include insights reporting, traffic management and policy enforcement and enables operators to actively enhance their subscriber experience. Procera's solutions are deployed in over 600 networks on all continents.

For more information, visit proceranetworks.com or follow Procera on Twitter at @ProceraNetworks



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