# VPN MPLS SERVICES

Is your network management system efficient to support increasing number of customers and services without increasing the organization?

Background

Virtual Private Network (VPN) services contribute a major part of a service provider's revenue. These services are often bundled with add-on services, which increase the complexity of the service provisioning process. The common solution to manage customer growth and the increasing number of customized services is to expand the number of technical and administrative resources. However, expanding the organization and at the same time staying ahead of the competition does not go hand in hand. Service providers must meet higher commercial and technical requirements with shorter time-to-market and lower production cost.

In all markets, and especially in the telecom sector, competitors attack with cost-leadership and highly customized solutions to gain customers. Customers' price expectations on low-end services push service providers to cost based pricing. With this in mind, new customers can cover only a part of a company's objectives of higher ROI and increased revenue. Selling new innovative services to existing customers and making the organization more efficient need to be equally important factors.
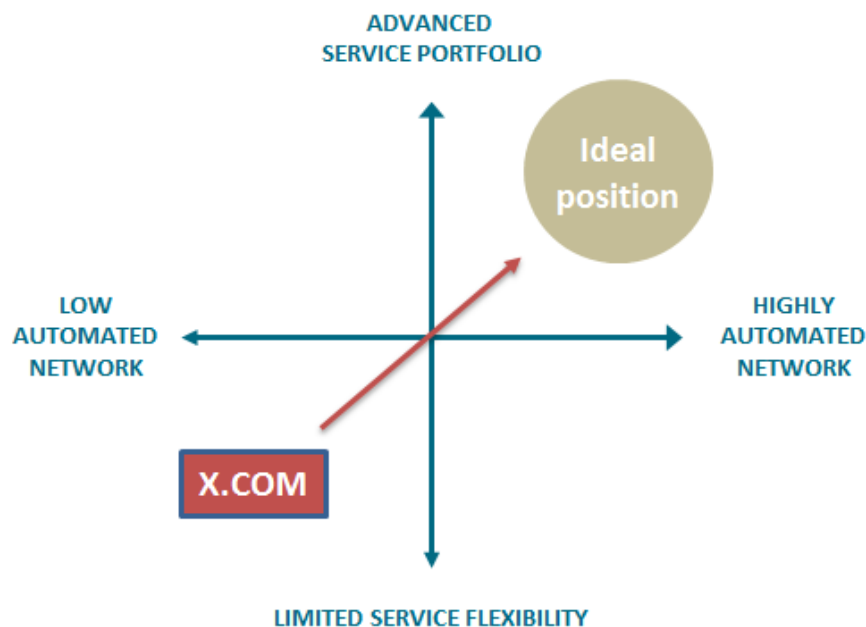
Total Cost of Ownership (TCO)

A technical solution's TCO gives high scores in a vendor evaluation process. Questions such as price per unit, life time/deprecation time and support are often important components of the equation. However, hardware related costs are easy to calculate but not the only area to focus on. The cost of controlling the network and services is a major factor when calculating the TCO. This part of the TCO is also harder to estimate as the costs are often hidden in long lead-times, errors, general personnel costs, ongoing development projects and consultancy fees.

Operators' Network Management Systems are often internally developed by a few individuals and supported by consultants. The development of the systems is typically driven to solve specific tasks where the coordination of data and logical awareness between the systems are seldom accomplished. This means that a change in one area leads to costly changes in another area or errors and mismatches.

The ever ongoing development of new features in combination with lack of documentation and key competence moving to new companies makes this type of management systems very costly. A poor network operation affects the whole organization and the company's ability to provide innovative services and short time to market.

The key for keeping the TCO to a minimum is to have a commercial Network Management System that fully automates all changes in your network.
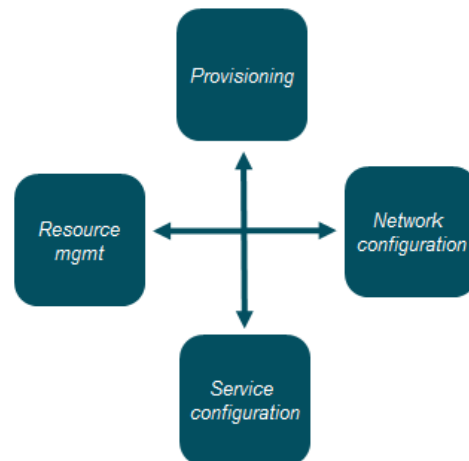
How lack of efficient operations effect your organization

Sales, where it all starts.

Individual and customized solutions are becoming daily requests from potential customers. Sometimes these requests are not covered by your standard products. Even your existing customer base asks for changes, such as service moves, adding new offices, increased bandwidth and new services, keeping you busy. How fast can you deliver?

Product management and operations,

The customized solutions and changes in the existing customer base are often dependent on a specific hardware type and functionality. For this reason implementing a new or customer specific service, or even simple service move, can become a challenging task a in a multi-vendor environment. In addition an introduction of a new service often includes integration with several OSS and BSS systems making the service implementation a costly and time consuming process leading to long lead times.

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The network, where it all ends

All customer requirements will at the end turn up at the network department. The normal way to expand the network and its' services is to manually configure the network elements via CLI interface. The drawback is the individual configuration style and people making mistakes. The risk for network configuration erosion is gradually increasing. Another problem is the lack of documentation, which leads to a situation where all modifications in the network have to start with an investigation and even small changes take time and effort.

Solution

In order to deal with all the described challenges a network operator must increase the level of automation to minimize human interventions and simplify the operations on a large scale. New services and changes can be implemented fast and cost efficient.

<u>Challenge</u>
Stay ahead of the competition while keeping costs to a minimum

<u>Solution</u>
BECS provides end-to-end automated service configuration.

<u>Benefits</u>
Customized services,
Complete network control and full documentation,
Cost efficient operations

BECS, the Automated Network Management Solution

BECS is a network management system for configuration and service provisioning developed by PacketFront Software. BECS automates all configuration and resource management in your network. One change in BECS can update a complete network within seconds.

How does BECS reduce your costs?
By automating as much as possible, you gain many advantages. Automation enables shorter lead times when it comes to Order-to-Revenue. It also decreases the amount of errors in your network with a magnitude as BECS removes complex steps from your decision making process hence simplifying the operations of your network.

Element configuration
Zero Touch configuration in Multivendor environment – BECS can perform a base configuration of an element from any vendor without any manual interaction. This can be used to configure for example Access Elements and Customer Premises Equipment, meaning that the installation process of a new PoP or a customer can be greatly simplified.
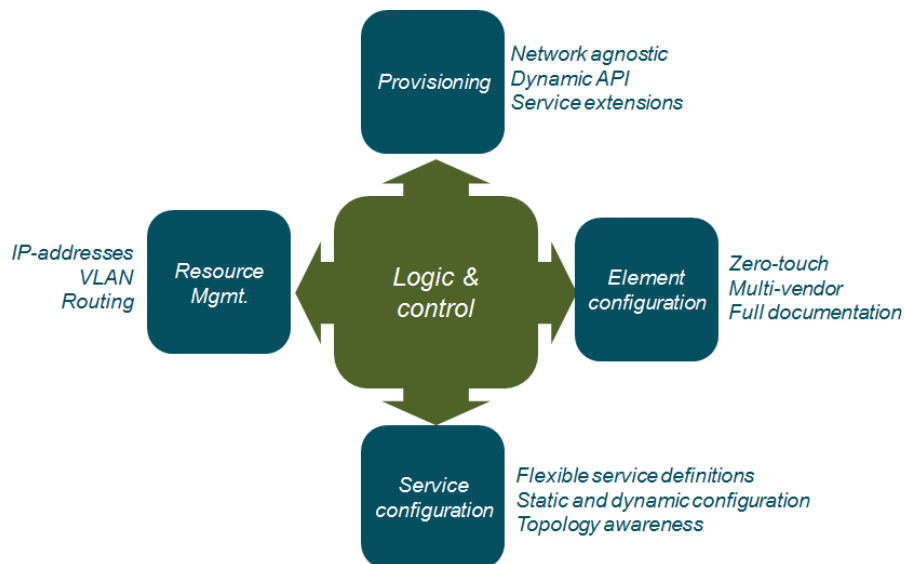
Resource management
By letting BECS handle resource automation, a very common source of errors is removed. For example an IP address or VLAN can not be accidentally used in several location because someone forgot to update the internal inventory system used for resources.

Service configuration

Thanks to BECS topology awareness, it knows about dependencies in service activation. This means that BECS automatically activates configuration in required all network layers and elements. It also means that it will remove configuration from all affected network elements when services are deactivated. Services are defined in BECS by using different service functions as building blocks. This creates generic service definitions that can be activated on any vendor platform. The hardware specific configuration templates associated with the service definitions make sure that the correct configuration is applied on each vendor platform.

Service Provisioning

The open and simplified API allows any northbound system to quickly and easily integrate towards BECS. BECS will expose a service catalogue of all available technical services and the provisioning system can activate these services with simple API calls without any knowledge of the affected hardware platform(s) or the network topology.

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Use-cases of BECS automation:

Company: Acme Inc.
Locations: 10
Service: L2 VPLS VPN

Use-case: Add a new VPN end-point (Service Provisioning)

Adding a new location to an existing VPLS VPN is not difficult. The task is to update all existing 10 locations with the new location and at the same time create the new location and add all other 10 locations to that one. However, it is also very easy to make mistakes and maybe miss one line in one of the locations, hence breaking the full mesh configuration. This becomes even more of a problem the larger the VPLS domain is.

Using BECS, it is very simple and always error-free to add new locations. BECS knows which locations are tied together in the broadcast domain. If you add a new one, BECS will automatically create the new location and add it's 10 peers while at the same time update all existing peers to include the new location. This is done in a completely automated fashion and can be provisioned by a northbound provision system through the open API or via the BECS GUI.

Use-case: Move a VPN endpoint (Service Provisioning)

Moving a VPN end-point is not uncommon. It can be due to different circumstances such as the customer is moving location or the network operator has to move the service to another CO or PE for any reason. When doing this, one has to create the new location, remove the old location and update all other existing locations to not include the old configuration. As was seen in the previous use-case "Add a new VPN end-point", the task in itself is not difficult, but mistakes are very easy to make. It is a very common scenario that some old configuration is not removed, either by mistake or due to lack of documentation, leading to what we call configuration erosion; old configuration left behind.

When using BECS, this whole process is completely automated. Using either the API or the BECS GUI, one can easily just drag-n-drop the service from the old location to the new one and BECS will automatically update all locations at once as well as remove old configuration. This also works when moving the service from a port in one vendor's equipment to a port in another vendor's equipment.

Use-case: Add a new PE router (Plan and Build)

Adding a new PE into your network is a common operation although not perhaps a daily task. It is usually done in a manually by editing a template of a standardized PE configuration. One just makes sure to update all the different unique resources that are used, such as IP addresses, VLANs and routing information. The configuration has to be synchronized and coordinated as part of the configuration is done before the equipment installation and part after the installation. The task of assigning resources is dependent on that several processes do not fail, e.g. up-to-date configuration of the resource inventory. A common mistake is a configuration of a resource that is already in use or reserved.

In BECS, this is a process that takes less than a minute. It can also be done before, during or after the network element has been deployed physically. Depending on the capabilities of the equipment, such as BOOTP/DHCP support during boot, the deployment can be done without a single line of configuration. BECS will automatically assign all resources that should be used, making sure no collision happen and will make sure that the configuration is complete and correct. No matter if you

add 1 or 100 elements, BECS will do this without a breeze. If other elements needs to be updated, such as Route Reflectors, they will be reconfigured automatically as well.

Use-Case: Deploying Customer Premises Equipment

Deploying Customer Premises Equipment is a timely and tedious process. The installation must be coordinated and the CPE's are configured in advance to make sure the service can be delivered. It is important that correct resources are used before installation as the equipment will not come online otherwise. Due to this often an experienced engineer has to do the installation. Many times he has to be in contact with the operations team as well during the installation process, meaning that several people have to be coordinated in order to succeed with the delivery.

Using BECS, this process can be fully automated, even leaving the whole process of installation to the customer if one so desired. Most Customer Premises Equipment on the market support a BOOTP/DHCP boot procedure where the equipment will ask for its configuration from the network. BECS will automatically detect the booting equipment and will create a unique configuration that the CPE will download using different methods, such as HTTP or TFTP. This means that the whole process of service provisioning, delivery and installation can happen at different times and even in different order. Different teams don't have to be synchronized and involved at the same time.

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