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Knowledge is Power: Streamlining Network Design and Enhancing Visibility

An Exploratory Study

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Introduction

Many service providers and network operators today are facing the problem of not knowing the actual state of their network. Typically, there are design guidelines and documentation, but often the guidelines are not fully implemented, and the documentation doesn't reflect the reality in the network. As time passes, the problem often escalates to the point where engineers wanting to make changes must first log in to each individual device to see how they are really connected and configured. Only then can they perform the intended changes, which must be done manually. This is an error-prone, inefficient, and costly way of working.

Network documentation problems can be solved by implementing a modern network inventory management solution, and by using a network orchestrator to increase automation. But the greatest benefit can be achieved when both solutions are integrated and work together in harmony. An integration of this kind ensures that the network design is implemented and documented automatically.

The powerful combination of network inventory and orchestrator

The combination of documentation and management of the infrastructure resources with FNT Command and the BECS® Network Orchestrator from PacketFront Software provides unprecedented control over your network assets. This means you can trust that your planning is implemented correctly in the network, and your inventory and the network are always in sync.

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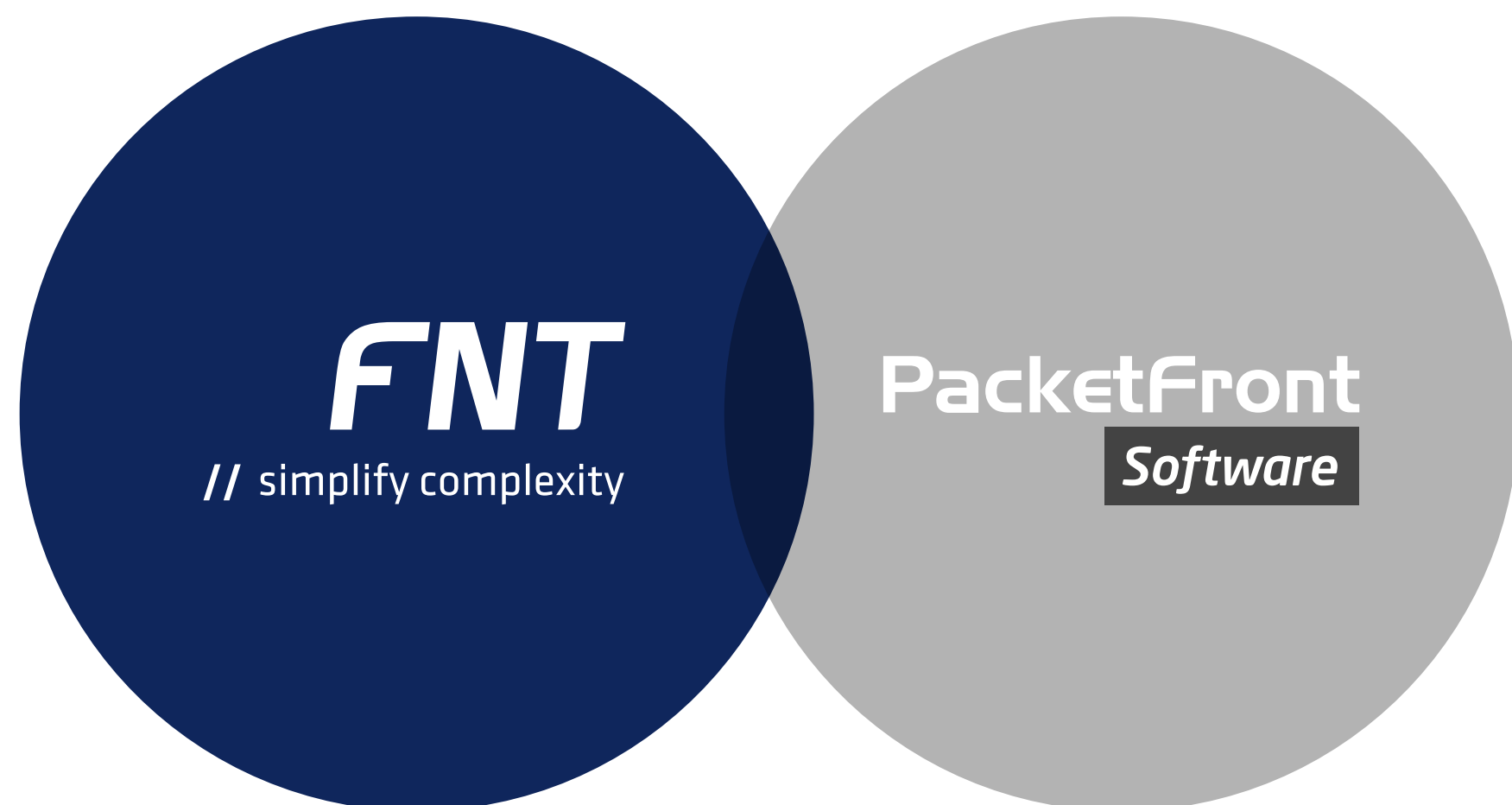
With FNT and PacketFront Software, you can trust that your planning is implemented correctly in the network.

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3 examples of improving network infrastructure management and orchestration

① Use Case: New Device Installation

In the planning phase, the design is done in FNT Command. A complete digital blueprint of the new network element is created, chassis is filled with modules, patch cables are created, physical and logical interface configurations are captured. The network engineer can download digital models of the devices from the FNT Component Library and start planning the network right away. The FNT Component Library currently contains more than 75,000 predefined assets and is constantly being updated and extended.

As soon as the network element is live and connected the BECS® Network Orchestrator detects and configures it based on the FNT Command design. Any deviations from the plan are flagged, making them clearly visible.

A network is typically in constant change and keeping the inventory up to date can be extremely challenging if done manually. With FNT Command and BECS® the network synchronization process can be automated to reduce human effort and manual, error-prone processes. For example, new or replaced line cards or devices can be detected by BECS® Network Orchestrator and reported to FNT Command. When this happens, FNT ReconEngine – a module of the FNT Command Platform which enables synchronization and reconciliation of FNT inventory data with relevant element and network management systems – comes into play. FNT Command uses FNT ReconEngine to automatically verify whether the reported change is acceptable and, if so, updates the inventory.

BECS Network Orchestrator automates firmware management by making sure that all existing and new devices are running the correct software version.

② Use Case: Firmware Inventory

It is important to automate firmware management and inventory for security reasons, and also because vendor licenses are often tied to device firmware. BECS® Network Orchestrator automates firmware management by making sure that all existing and new devices are running the correct software version. Any upgrades are automatically reported to FNT Command, which keeps the firmware inventory up to date. Using FNT Command's powerful reporting capabilities, this firmware information can be incorporated into inventory reports and dashboards.

③ Use Case: Service Provisioning Automation

BECS® Network Orchestrator is built for automating the provisioning of complex services, such as VPNs spanning multiple parts of the network. Since it is an automation tool, BECS® needs a correct and actual network inventory to perform service availability checks against. Checking service availability against the inventory is more reliable than doing so against the network. This is because inventory stores not only the actual, but also the planned state of the network. Once the availability check is done, the information about selected network paths can be pushed to FNT Command directly via the open APIs and can be combined with other network information, such as the cabling and transmission layer, for a full end-to-end view of the service delivery path.

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FNT Command

FNT solutions simplify the management of highly complex digital infrastructures to enable telecom providers and network operators to efficiently manage their networks. The cloud-ready FNT Command Platform records hybrid telecommunications, data center and IT infrastructures as a digital twin and documents them across all levels, from buildings to digital services. FNT's solution includes integrated documentation, planning and visualization capabilities to manage physical, logical and virtual resources in one consolidated solution.
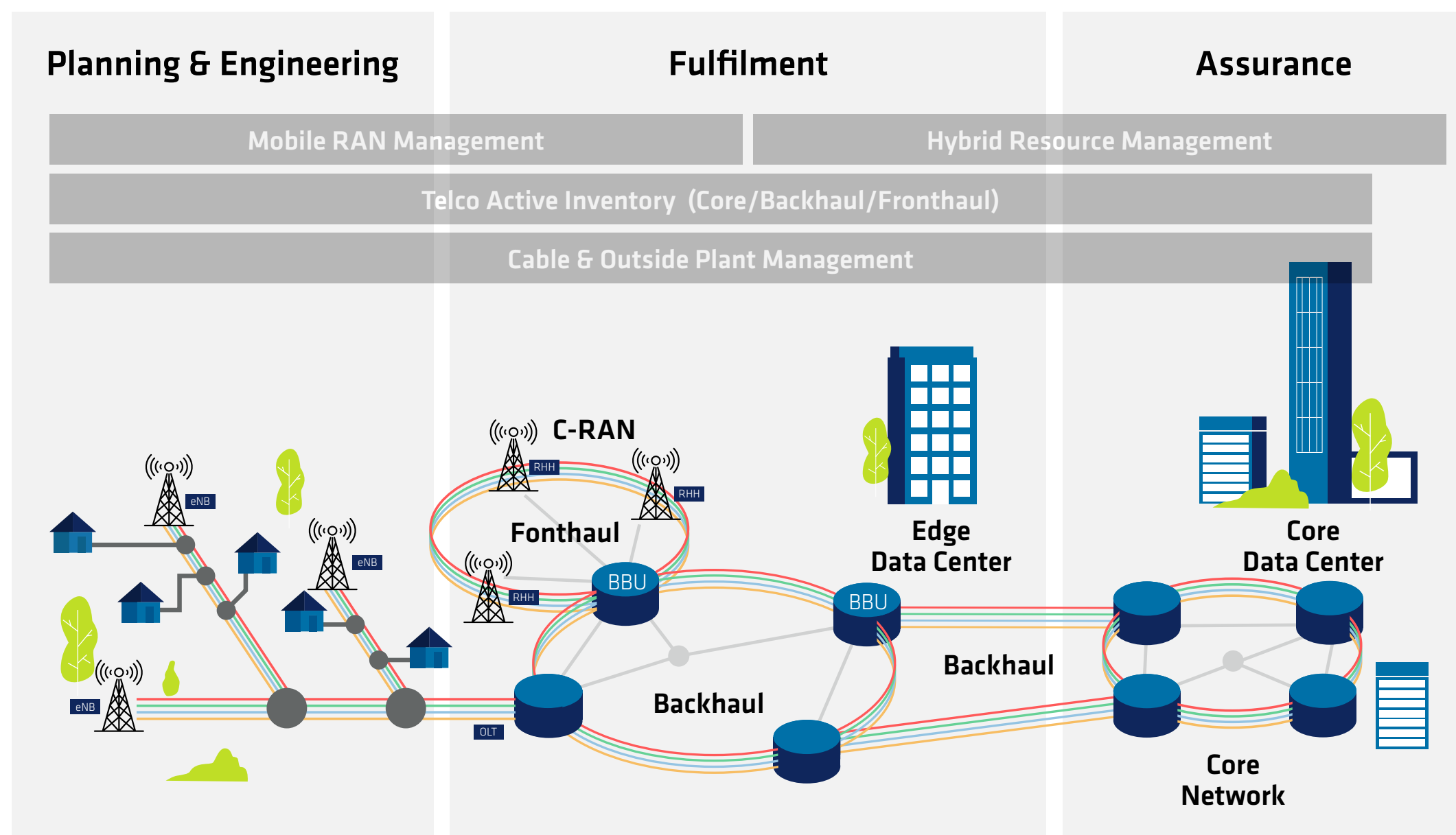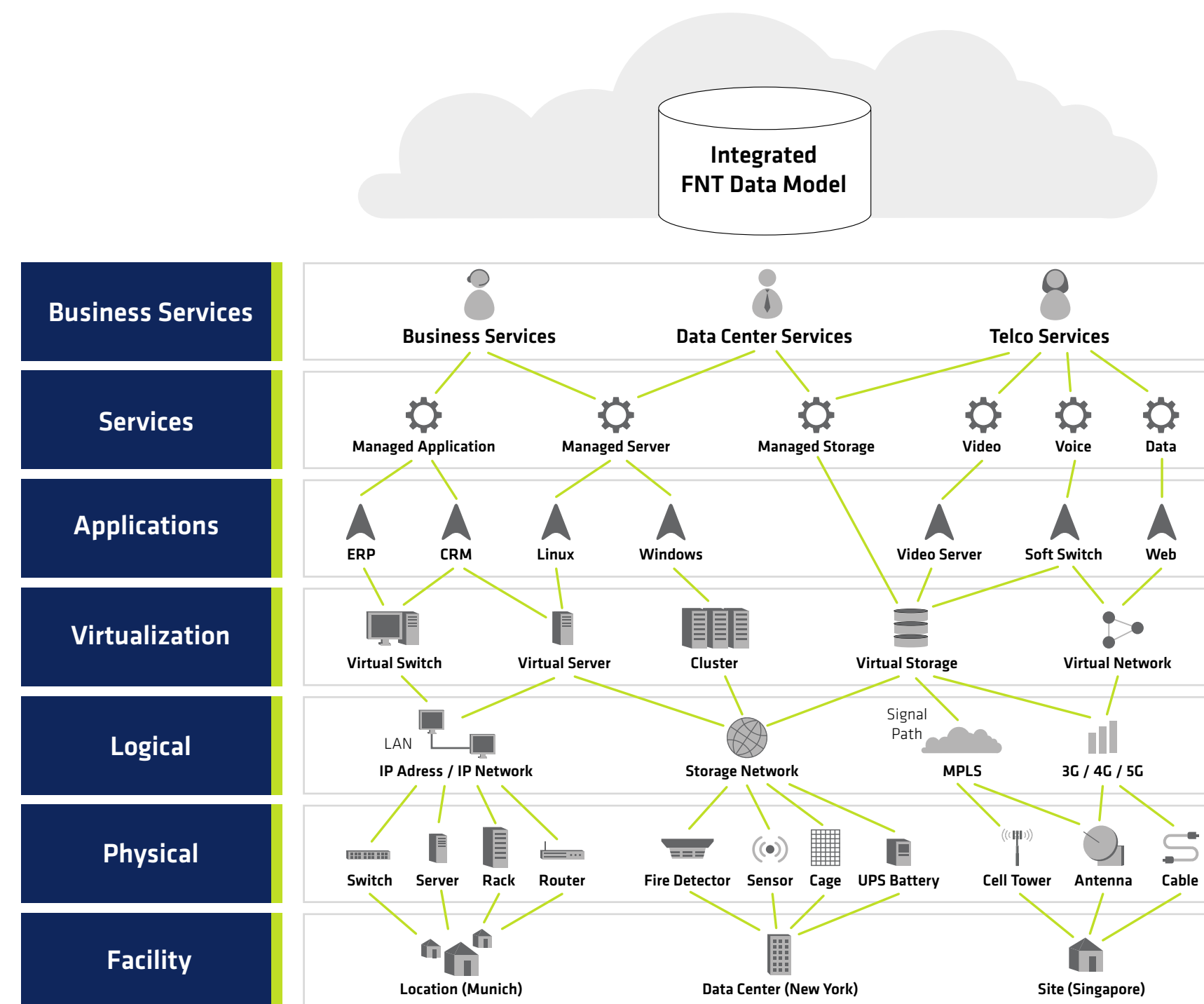
*This single source
of truth includes
all relevant resource
information.*

Thanks to the proven unified FNT data model, which covers locations, devices, networks, virtualization, data centers and services, FNT Command Platform is future-proof and network virtualization-ready. The FNT data model and functionalities can be flexibly extended and integrated with other systems, providing the foundation for a modern OSS/BSS architecture. This single source of truth includes all relevant resource information for the planning and engineering, service fulfilment and service assurance processes of telecom providers.

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**Integrated
FNT Data Model**

| Business Services | Business Services | Data Center Services | Telco Services |

| Services | Managed Application | Managed Server | Managed Storage | Video | Voice | Data |

| Applications | ERP | CRM | Linux | Windows | Video Server | Soft Switch | Web |

| Virtualization | Virtual Switch | Virtual Server | Cluster | Virtual Storage | Virtual Network |

| Logical | LAN — IP Adress / IP Network | Storage Network | Signal Path — MPLS | 3G / 4G / 5G |

| Physical | Switch | Server | Rack | Router | Fire Detector | Sensor | Cage | UPS Battery | Cell Tower | Antenna | Cable |

| Facility | Location (Munich) | Data Center (New York) | Site (Singapore) |

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Gain Transparency of your complete Network Resource Base

- Document locations, Telco PoPs and mobile sites.

- Reconcile all active transport (xWDM, IP/MPLS and Ethernet) as well as access (mobile RAN, FTTX) networks within one single database.

- Manage all cable and passive assets in combination with GIS-based location intelligence.

- Use partner-ready integration framework which includes generative open APIs, ETL, Reconciliation and Notification functions to integrate FNT Inventory in OSS landscape.

Support Engineering and Fulfilment Processes

- Plan network expansions and rollouts based on accurate actual documentation.

- Automatically create work orders for the field personnel to execute planned tasks.

- Enable cross-media and cross-technology auto routing functionality on duct / pipe, cable / fiber, and circuit layers.

- Perform resource availability checks and reservations and provide the resulting datasets to Provisioning.

Optimize Operations

- Instantly identify affected services in case of outages across passive, active and virtual network layers

- Identify customers affected by maintenance windows to inform them in advance.

- Provide data enrichment to optimize Incident and Fault management processes.
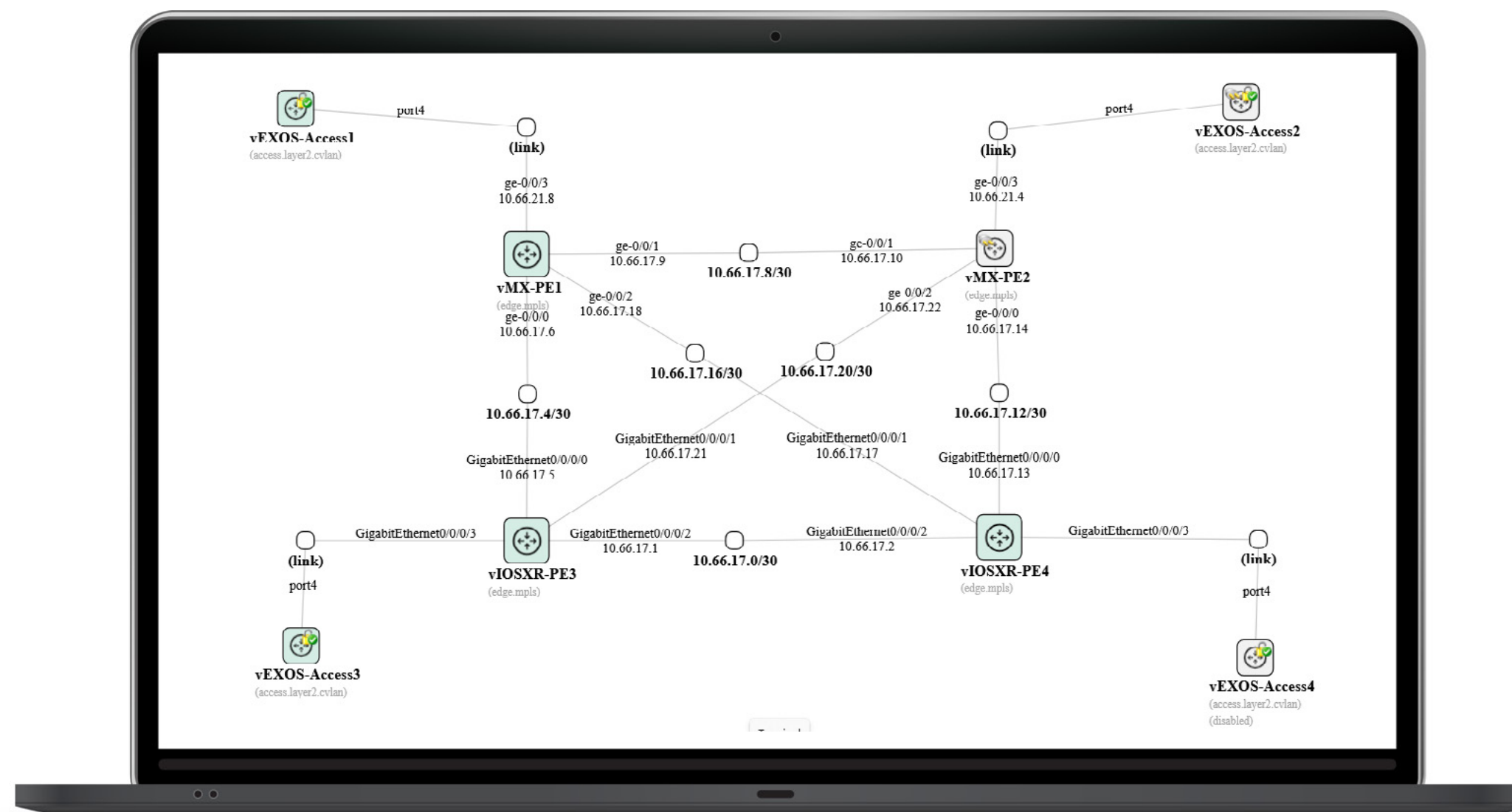
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BECS Network Orchestrator

PacketFront Software

PacketFront Software has provided automation solutions to operators and enterprises for more than 20 years with the aim to make network operation easy. The solutions enhance the agility, competitiveness, and profitability of customers by providing strong orchestration solutions for complex multi-vendor networks.

BECS® is an intent-based Network Orchestrator. Its highly scalable architecture makes it a perfect choice for both Tier 1 carriers as well as those operating smaller networks. It streamlines the management and significantly reduces the costs when building and operating a network. Furthermore, it simplifies the complexities of multi-vendor environment management from core network down to CPEs.

Besides cost savings, the increased automation of service delivery introduced through BECS® positively impacts customer satisfactioan, which leads to increased customer retention and reduced churn.

Service Orchestration
Ready service model: VPN, Internet, VoI?...

Resource Orchestration
What resources are to be used and where?

Network Orchestration
Network Topology: what elements are affected by each change

Element Automation
Communication with network elements: CLI, SNMP, TR-069, NETCONF

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At the heart of BECS® is a hyper-efficient core, in which the network topology, service and element models are defined. Together with functions such as resource management (VLANs, IP addresses etc.) BECS® creates unique configuration for each device in real time. This ensures a solid foundation for the system, providing a reliable and robust framework to build upon. Built on top of the core are "element managers" that communicate seamlessly with various vendors' devices using applicable protocols, such as CLI, SNMP, TR-069, APIs and Netconf.

Our dedicated customer success professionals ensure smooth deployment of the BECS® platform. The result is highly auto-mated workflows for day-to-day operation of your network. These workflows assist customer support, operations and net-work engineers eliminating many of the routine tasks and radically shorten the Time-To-Revenue.

Network consolidation

BECS® converts simple service API calls to complex network topology and hardware dependent configuration and pushes them to devices. This means BECS® harmonizes your network, and you can use the same business processes even if the underlaying network(s) can take many shapes and forms.

Network Security

One of the biggest new pieces of legislation applicable for operators is the updated Network and Information Systems directive (NIS2). PacketFront Software has implemented and will continue to imple-ment support for NIS2, not only when it comes to functionality, but also to comply with organizational requirements set for suppliers.

The result is highly automated workflows for day-to-day operation of your network.

Bringing value to the customer together

This exploratory case study shows how the combined FNT and PacketFront Software solutions can help streamline network automation and gain visibility into network assets, which empowers users to expand the product portfolio and stay ahead of the competition.

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About FNT

FNT GmbH, headquartered in Ellwangen (Jagst), Germany, simplifies the management of highly complex digital infrastructures in companies and public authorities with its FNT Command Platform. With the cloud-enabled "software made in Germany", IT, telecommunications and data center infrastructures can be efficiently recorded as digital twins and documented across all levels from buildings to digital services. The software also offers open interfaces and numerous functions for planning, implementing and automating transformations and changes in an integrated manner. FNT's customers include more than 500 companies and government agencies worldwide, including more than half of the DAX-40 listed corporations. FNT operates offices in several locations in Germany as well as in New York, Singapore and Timisoara and has an international partner system with market-leading IT service providers and system integrators.

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