MEF

The Case for Standardized and Automated Inter-Provider Business Interface

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Disclaimer

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1   Abstract

This paper is aimed at those decision makers within ICT-SPs (Information and Communications Technologies Service Providers including traditional telcos, MSOs, MNOs, cloud operators and other entities involved in wholesale supply of data services) and their wholesale data services partners that are discussing adoption of standardized and automated inter-provider business interfaces.

The paper explains the market drivers for inter-provider business automation resulting from enterprise customer demands from their service providers, and how those market drivers are passed through to wholesale partners of the service providers.

The concept of standardized and automated inter-provider business interfaces for different business activities is explained, and how they are essential to meet enterprise expectations.

The business outcomes of investment by service providers and wholesale partners in standardized and automated business interfaces are laid out together with quantitative examples for wholesale partners.

2   Introduction

Enterprises of all types and sizes, are increasingly adopting dynamic, application-oriented data services for their growth in a digital economy.

In parallel, data service providers are able to take advantage of new technological approaches like programmable networking (SDN and SD-WAN) and virtualized resourcing (NFV) to create and deliver those dynamic data services to their enterprise customers within their own network footprints. Furthermore, those service providers are increasingly using MEF's Lifecycle Service Orchestration (LSO) paradigm to seamlessly extend their on-demand data services outside their own network and product footprint and across partner networks in order to achieve larger geographical and product footprints.

ICT-SPs (e.g., Telcos, MNOs, MSOs, Cloud providers) have been buying wholesale data services from wholesale partners for decades in order to extend the service providers' footprint and serve their customers' off-net sites with managed data services. Until recently, those wholesale data connectivity services have been typically fixed bandwidth connections with multi-year fixed-term contracts. The business interactions with wholesale partners were designed accordingly and little to no emphasis was placed on inter-provider automation – until now. With the dramatic increase in enterprise demand for on-demand, customizable data services, inter-provider business automation has become a high priority topic for ICT-SPs.

3   Market Drivers

Enterprises are redistributing their IT applications and infrastructure out of the enterprise premises into the cloud, and are increasingly taking advantage of low latency, high bandwidth data connectivity as well as the dramatic decrease in the cost of edge computing (MEC and IoT) to reshape their businesses.

In the medium to long term, enterprises will be addressing markets that require hyper-automation – for example for IoT, Industry 4.0, autonomous driving, and smart cities. These trends are evidenced in the analyst reports from Allied Market Research and Global Market Insights among many others.[1]

3.1   Enterprise Service Expectations

Enterprise customers expect a one-stop-shop environment that allows ordering of managed connectivity, compute and storage services in an integrated manner through a single interface point. These on-demand data services are a combination of compute/application-on-demand and storage-on-demand services in the cloud as well as connectivity-on-demand services in the wide area network (WAN). On-demand data services need this combination to work efficiently and seamlessly across geographical and operational boundaries.

Some ICT sectors have introduced automated lifecycle management for services such as compute and storage but rely on manually delivered fixed-bandwidth dedicated connectivity, or always-on best effort Internet to realize data transport. The lack of corresponding rapid delivery for on-demand inter-provider managed connectivity services is a major barrier to achieving the goal of truly global, agile, enterprise IT environments. Combination of cloud-to-telco services or telco-telco services, even if both sides have an automated lifecycle management platform, is managed manually, and in some cases not even through a "one-stop-shop" arrangement which adds to overhead and creates service operations, administration and monitoring complexity.

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[1] The global multi-cloud management market was valued at US$ 1,198.4 million in 2016, and is expected to reach $6,816.5 million by 2023, growing at a CAGR of 28.4% from 2017 to 2023. Source: Allied Market Research.

Global virtual private network market slated to grow from US$ 17 billion to US$ 54 billion by 2024. Source: Global Market Insights.

3.2   Enterprise Requirements for Service Providers

These enterprise expectations translate into a set of the following requirements from their service providers. On-demand data services need to reach any location and any type of endpoint regardless of the type of underlay data connectivity infrastructure available. The services must be adaptable in real-time to policies configured by the enterprise, and their performance and path (for regulatory purposes) throughout the end-to-end service must also be visible in real time through a single 'pane of glass' portal. Moreover, each stage of the lifecycle for the service, including commercial and business aspects, must be fast enough to support timelines mandated by the business requirements.

These emerging enterprise requirements are an opportunity for service providers to transition to high margin, highly differentiated services that leave behind commoditized, low-margin fixed-bandwidth fixed-term services.

2019, Diagram provided by Amartus Limited
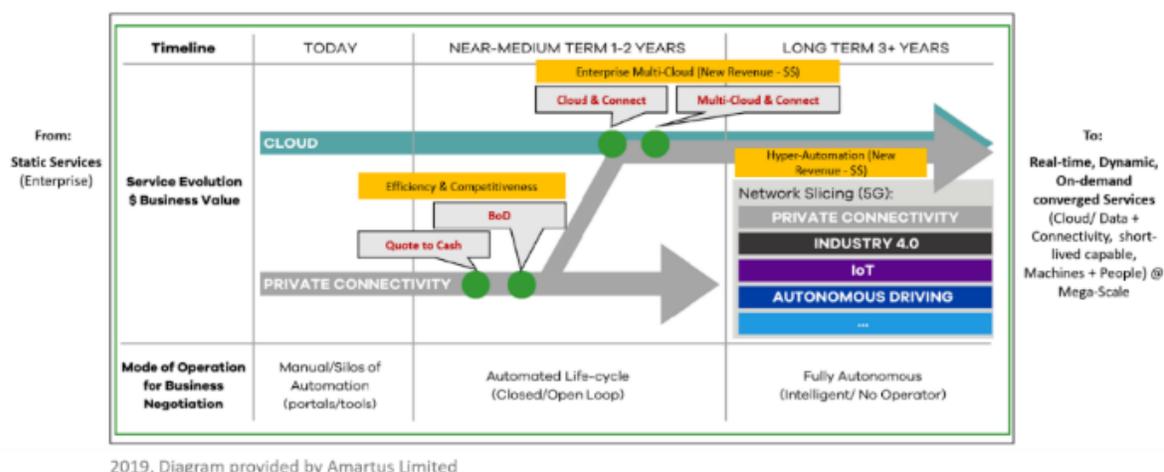
Figure 1: Opportunity for Service Providers

ICT-SPs are embracing frictionless commerce, providing real/near-real time business and technical negotiation of inter-carrier connectivity services to remain relevant for enterprise CIOs. The automated multi-domain platform that enables delivery of on-demand data services (including connectivity, storage and compute) should include a commercial layer that offers value to all stakeholders (e.g., telcos, clouds, MNOs etc.).

3.3   Service Provider Requirements for Wholesale Partners

Similarly, these requirements from ICT-SPs lead to requirements from their respective wholesale supply-chain partners. ICT wholesale partners involved in a wholesale supply chain need to be able to exchange lifecycle information such as service availability, quotes, orders, usage data, billing, and settlement with their ICT-SP customers within timelines that make on-demand type of services feasible.

4   Standardized and Automated Inter-Provider Business Interface

To meet these respective requirements, ICT-SPs and their wholesale partners must automate their business interactions with each other.

4.1   Business Functionalities

This business-to-business interface between service providers and their wholesale partners is where service providers check with their partners such things as whether the partner can provide service to a particular location ("serviceability"), whether the partner can provide the service with specific capabilities ("product offering qualification"), and whether the partner has the service available at that given moment ("inventory"). Additional business interactions include quoting, ordering, ticketing, usage and SLA records (that may affect fees and credits), as well as invoicing, reconciliation and settlement.

LSO Sonata: Business Functionality

Figure 2: LSO Sonata Business Functionality

4.2   Manual Intervention

These and other business functionalities are already available to service providers from all wholesale partners today. However, these core business functionalities include extensive manual/human intervention – both on the wholesale partner side and on the ICT-SP side. Manual intervention results in lengthy, and often error-prone, interactions that last days, weeks or even months. Long business interactions like these are perhaps acceptable for the era of basic, fixed bandwidth long-term contract services. However, they are completely unfit for purpose in the era of highly dynamic, rapidly changing data services that is emerging today where business interactions may last no longer than a few minutes or sometimes even seconds.

4.3   Automated and Proprietary

In recent years, service providers and wholesale partners have migrated some of those manual processes to software based automated machine-to-machine interfaces - otherwise known as Application Programmable Interfaces ("APIs"). Such machine-to-machine interfaces have often been developed on a bilateral ad-hoc basis resulting in diversity and inconsistency that is difficult to manage and scale.

Take for example, two large service providers called Service Provider X and Service Provider Y. They have been buying and selling wholesale data connectivity from one another for many years and have gradually replaced manual mutual access to their business functionalities with automated, software-based access. However, the IT departments may have, at large cost, developed that automated access specifically for the X-Y relationship and only for specific types of services (e.g. MPLS-based IP VPNs, Carrier Ethernet). The automated access they developed often won't work for new services that are being introduced by the service provider and won't scale for business interaction with other wholesale partners. As dozens of new services get introduced into the service providers' product portfolios and with as many as a few hundred potential wholesale service partners around the globe, these one-off proprietary automated interfaces specific to two partners are not scalable.

4.4   Automated and Standardized
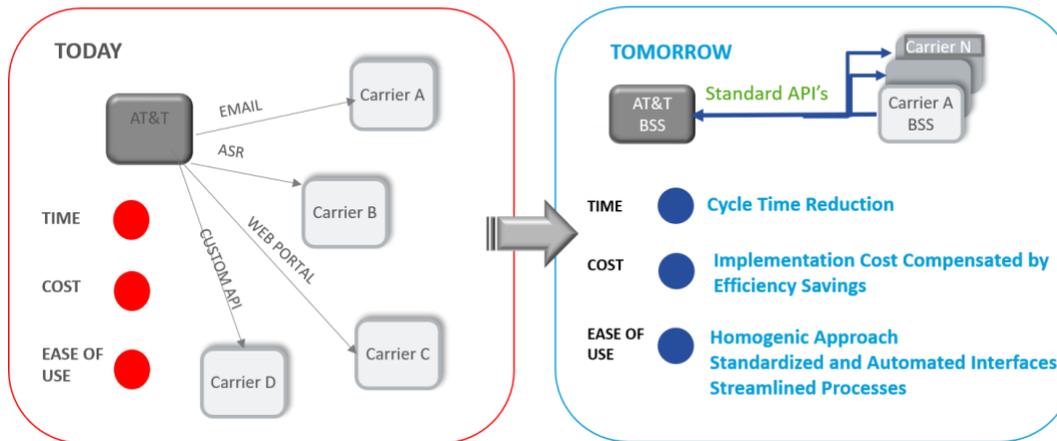
Figure 3: Transition from manual and proprietary business interactions to standardized, automated business interactions

This is where standardized machine-to-machine business interfaces between service providers and wholesale partners become so important. They enable service providers to invest in these automated interfaces and reuse them for large numbers of wholesale partners and for many current and future on-demand data services. Conversely, wholesale partners can invest once in a standardized automated business interface and appeal to a much larger range of potential service provider customers.

This standardization work has been undertaken by the MEF-Forum ("MEF"). MEF has defined the conceptual interface reference points ("IRPs") in the ecosystem where business and operational interactions take place. The name provided for the abstract business IRP in the ecosystem between service providers and wholesale partners is called "LSO Sonata". MEF is currently standardizing automated, software-based (APIs), access to business functionalities between service providers and wholesale partners at LSO Sonata for a range of services starting with wholesale Carrier Ethernet services.

The objective of MEF is not only to continue standardizing for more business activities and services, but to increase adoption of these LSO Sonata APIs to replace existing manual or proprietary business interfaces between service providers and wholesale partners.

5   Business Decision

Implementing standardized automated business interfaces by a service provider or wholesale partner is a business decision based on an assessment of the value and the associated costs. It is often taken in the context of existing BSS-OSS transformations underway or being contemplated within the organization, making consideration of alignment with industry standards for business interfaces even more complex.

However, it is practical to first focus on automating existing static services and a limited set of value generating business functionalities, incrementally introducing automation of additional business functionalities and support for new on-demand services as they come on-stream.

6   Business Outcomes for Service Providers and Wholesale Partners

The benefits of enabling standardized and automated inter-provider business interfaces fall into four main categories – increased revenues, reduced OPEX, acceleration of the service lifecycle, and increased customer loyalty.

6.1   Increased Revenues

Automation of inter-provider business activities creates opportunities to offer to enterprise and wholesale customers on-demand global data services - a key component of the lucrative enterprise multi-cloud IT solution - with resulting new revenue streams. It also creates for the service provider opportunities to tap into potential hyper-automation of various industry vertical markets with global network slicing and industry specific connectivity solutions resulting in additional new revenue streams.

6.2   Service Lifecycle Acceleration

With automation comes acceleration of processes. The elimination of manual steps and the associated queuing and holding time shortens the duration of lifecycle process steps. Examples can be automated quoting based on an on-line catalogue that may take less than a second, compared with a manual process where a quote is obtained via exchange of emails and a manual lookup. Another example is invoice dispute resolution which is typically a lengthy manual process which may take weeks, in contrast to the numerous Proofs of Concept that have demonstrated automated dispute resolution within seconds. Even in cases where only partial automation exists – automated tools can accelerate human interactions and assist in decision-making resulting in acceleration of processes.

6.3   Reduced Operational Expenses

Automation improves operational efficiency and timeliness, reduces errors, allows for faster fault isolation and recovery, and allows better use of human resources resulting in OPEX savings for the service provider and wholesale partner.

6.4   Increased Customer Loyalty

The enterprise experience is improved by making service delivery almost instantaneous even when that service spans multiple provider network footprints. Meeting these emerging enterprise

expectations with standardized inter-provider automation will result in retaining and growing service provider revenue based on improvement of the customer experience for inter-provider connectivity services.

7   Example ROIs

To illustrate the business benefits for the wholesale partner in adopting standardized LSO Sonata APIs, two example ROI analyses are provided – one for international wholesale providers, and the second for local access wholesale providers. These examples are purely illustrative and only cover certain aspects of the business analysis. However, they may provide a useful starting point for internal discussions within service providers to analyze the business case for standardizing and automating their inter-provider business interfaces.

7.1   Example ROI: Automation by International Wholesale Provider

The following is a simplified ROI example based on an international wholesale provider. The ROI calculation for each provider depends on their pre-existing annual revenue / order position and the level of internal operations and network automation they may already have in place. The international wholesale provider is chosen for this example because their major business involves inter-provider negotiation, so they stand to gain the most from automation. This is in contrast to the local access wholesale provider whose international wholesale business is only a percentage of their overall business (see separate example).

The example below assumes work has been undertaken to automate the provider's internal operations and network before inter-provider automation is added. It looks first at the ROI for automation of the provider's existing 7k orders per annum order base only, and then at revenue acceleration and net new business potential for existing and new service offerings (only possible with automation).

The ROI in this example is: ROI and savings realized within Year 1.

Overall Assumptions:

- Undertake implementation of both Seller & Buyer LSO Sonata compliant automation

- LSO Sonata used by Provider to Buy/Sell Access Services only (not Transit) from/to other Providers

- 5% margin increase attributed to automation (reduce human resource etc.)

- 6 months of significant investment to implement/develop LSO Sonata requiring 10 Full Time Equivalent (FTE) Headcount, reducing to 4 FTE for maintenance /upgrades etc. thereafter

- Significant potential for revenue acceleration, to grow revenue for existing/new service offerings

- Benefits of automation realized after initial 6 months of implementation

- To simplify the ROI all revenue for an order is recognized in the year the order is received. Realistically revenue will be recognized in step with the delivery of the service.

7.1.1 Existing 7k orders per annum static inter-provider connectivity orders fulfilled (average)

Assumptions:

- Annual revenue = 7k Access Service orders per annum x €500 per month/per order x 12= €42M

- Costs only cover work to adapt/extend provider's existing B-OSS to implement LSO Sonata – **assumes Provider has a modern BSS with suitable capabilities that can support LSO Sonata (not true for all providers)**

- Simplification: annual B-OSS software license same as current levels (cost neutral)

		Cost	Saving	Annual	Aggregate
				Sub-total	Total
Year 1	**Integration & Dev costs**				
	10 FTE @ 120K p.a. first 6 months of year	€600,000			
	4 FTE @ 120K p.a second 6 months	€240,000			
	Opex efficiency				

	5% of €42M annual revs, second 6 months of year		€1,050,000		
				€210,000	€210,000
Year 2	**Integration, Dev & Maintenance costs**				
	4 FTE @ 120K p.a. full year	€480,000			
	Opex efficiency				
	5% of €42M annual revenue		€2,100,000		
				€1,620,000	€1,830,000
Year 3	**Integration, Dev & Maintenance costs**				
	4 FTE @ 120K p.a. full year	€480,000			
	Opex efficiency				
	5% of €42M annual revenue		€2,100,000		
				€1,620,000	€3,450,000

Table 1: Example International Wholesale Provider existing orders on

Assumptions

Y1 first 6 Months FTE (Full Time Equivalent)	10	Headcount
FTE thereafter	4	Headcount
FTE Cost	€120,000	Euro
Opex Efficiency	5%	Increase in margin due to automation
Annual revenue	€42,000,000	7,000 Orders x €500 pm (avg. fee) x 12 (months)

Outcome: ROI realized in Year 1 with savings of Euro 210 k and savings of Euro 1.62 M per annum thereafter.

7.1.2 Net New Revenue Existing/New Service Offerings

Assumptions:

- Improved quote to order conversions leading to faster time to revenue and additional new orders (revenue)

- Enables new revenue generating offerings (on-demand) only possible with LSO Sonata automation

- First to market with new service offerings leading to year on year increase in orders

- Average €500 revenue per month per order (baselined on average Access Service order)

- Renewed/replacement orders yield same revenue (may be higher/different spec)

Period	Services	Phase	Base Orders	Net New Orders	Additional Revenue	Annual Additional Revenue	Orders Total
Year 1 (2nd half)	Existing Static Connectivity	Faster, Quote to Order conversion	7,000	500	€1,500,000		7,500
	BoD	Early Adopters		1,000	€6,000,000	€7,500,000	8,500
Year 2	Cloud & Connect	Early Adopters		1,000	€6,000,000		9,500
	BoD	Early Majority		2,000	€12,000,000	€18,000,000	11,500
Year 3	Network Slicing	Early Adopters		1,000	€6,000,000		12,500
	Cloud & Connect	Early Majority		2,000	€12,000,000		14,500
	BoD	Late Majority		2,000	€12,000,000	€30,000,000	16,500

Table 2: Example international wholesale provider revenue growth potential

Outcome: Significant year on year revenue growth potential due to automation.

7.2   Example ROI: Automation by Wholesale Local Access Provider

The following is a simplified ROI example based on a Wholesale Local Access Provider who provides the last-mile of connectivity for inter-provider services in specific geographical locations. The ROI calculation for each provider depends on their pre-existing annual revenue / order position and the level of internal operations and network automation they may already have in place. The majority business for a typical last-mile wholesale local access provider is for on-net services supplied to retail provider partners operating in the regions served. Only a percentage will be last-mile services sold to international wholesale providers for inter-provider services. The ROI calculation in this example looks at a cost-effective means to implement the LSO Sonata compliant functionality needed for inter-provider service negotiation between wholesale providers only. It assumes the Provider does not have an existing BSS that can be readily extended/adapted to providing LSO Sonata or that the cost of doing so is not economically viable given the volume of business involved.

The solution in the example below assumes minimal upfront costs (integration, customization & licensing) by adopting a vendor-supplied standalone LSO Sonata compliant solution that would allow the provider to participate in the eco-system and is capable of being integrated over time if and, when business volume can justify it and internal automation can support it. It first looks at automation for the provider's existing 500 per annum inter-provider order base only, and then at the net new business potential to grow orders for existing inter-provider services and new orders based on new service offerings only possible with automation.

The ROI in this example is: Break-even in less than 12 months.

Overall Assumptions:

- Vendor supplied LSO Sonata seller side automation, enabling partners to buy services

- 5% margin increase attributed to automation

- Assumes 1% of provider's revenue from orders for vendor supplied LSO Sonata Software solution licensing & support fees (% is illustration only, depends on vendor)

- Significant potential to grow existing revenue

To simplify the ROI all revenue for an order is recognized in the year the order is received. Realistically revenue will be recognized in step with the delivery of the service

7.2.1 Existing 500 orders per annum static last-mile inter-provider connectivity orders fulfilled (average)

Assumptions:

- Annual revenue = 500 orders per annum x €500 per month/per order x 12 = €3M

- Not economically viable to adapt provider's existing B-OSS to support LSO Sonata or provider doesn't have a suitable B-OSS

- Provider adopts vendor-supplied inter-provider LSO Sonata compliant automation solution:

  o Fully functional, initially deployed to operate standalone (independent of B-OSS)

- No, or minimum, upfront cost/effort for integration or licensing, ready to begin transacting with partners in a matter of days, pay per use based on service turn-ups

- Capable of being integrated over time if & when business justifies it and internal B-OSS (North – South) is capable.

- Levels of automation:

  - Level 1: Standalone LSO Sonata Solution < 2 weeks

  - Level 2: Basic B-OSS integration, key function(s) only (e.g. support synchronous response for qualification/quote requests) < 1 month

- Only need to consider costs of providing (staff & licensing) LSO Sonata inter-provider for wholesale inter-provider automation, assume automation for retail partners (where applicable) will be covered by separate retail provider business case.

- Significant automation benefits realized after Level 1 completion (majority), further incremental benefits after Level 2

- Vendor provides forward compatibility under annual licensing & support. Service provider has some recurring annual cost for maintaining / integrating upgrades.

Note: It is assumed that full-blown adaptation of the provider's existing B-OSS is not an option considering the high cost involved. Further incremental B-OSS integration may be justified as business value is realized (determined on a case-by-case basis).

Period		Cost	Saving	Annual Sub-total	Aggregate Total
Year 1	Config, Integration & License/Support costs				
	Level 1 team	€30,000			
	3 @ Avg. €1000 per day for 10 day each				

Year	Description				
	Level 2 team	€60,000			
	5 @ Avg. €600 per day for 20 day each	€60,000			
	Software Licensing & Support				
	1% of €3M annual revenue	€30,000			
	Opex efficiency (pro-rated post Level 1 completion)				
	5% of €3M annual revenue 11 months pro-rated		€137,500		
				€17,500	€17,500
Year 2	Config, Integration, Maintenance & License/Support costs				
	Level 1 team	€30,000			
	3 @ Avg. €1000 per day for 10 day each	€30,000			
	Software Licensing & Support				
	1% of €3M annual revenue	€30,000			
	Opex efficiency				
	5% of €3M annual revenue		€150,000		
				€90,000	€107,500
Year 3	Config, Integration, Maintenance & License/Support costs				
	Level 1 team	€30,000			
	3 @ Avg. €1000 per day for 10 day each	€30,000			
	Software Licensing & Support				
	1% of €3M annual revenue	€30,000			
	Opex efficiency				
	5% of €3M annual revenue		€150,000		
				€90,000	€197,500

Table 3: Example last-mile wholesale provider existing inter-provider orders only

Assumptions

Level 1 Team Size	3	Headcount
Level 1 Team Member Cost (per day)	€1,000	
Level 1 Project Duration (days)	10	
Level 2 Team Size	5	Headcount
Level 2 Team Member Cost (per day)	€600	
L2 Project Duration (days)	20	
Opex Efficiency	5%	Annual Increase in margin due to automation
Vendor S/W Licence Fee (as % of revenue)	1%	Annual Software License/Support fee
Annual revenue	€3,000,000	500 Orders x Euro 500 pm (Avg fee) x 12 (mths)

Outcome: Year 1 saving of €17.5k per annum, savings of Euro 90k per annum thereafter.

7.2.2 Net New Orders – Existing/New Service Offerings

Assumptions:

- Improved quote to order conversions leading to faster time to revenue and additional new orders (revenue)

- LSO Sonata enables on-demand negotiation for connectivity services that underpin a range of new services for end customers resulting in new revenues generating orders

- First to market with new service offerings leading to year-on-year increase in orders

- Average €500 per month per order (baselined on Access Service order average)

- Renewed orders yield same revenue (may be higher/different spec)

Period	Services	Phase	Base Orders	Net New Orders	Additional Revenue	Annual Additional Revenue	Orders Total
Year 1 (11 months)	Existing Static Connectivity	Faster, Quote to Order conversion	500	92	€550,000		592
	BoD	Early Adopters		100	€600,000	€1,150,000	692
Year 2	Cloud & Connect	Early Adopters		100	€600,000		792
	BoD	Early Majority		200	€1,200,000	€1,800,000	992
Year 3	Network Slicing	Early Adopters		100	€600,000		1,092
	Cloud & Connect	Early Majority		200	€1,200,000		1,292
	BoD	Late Majority		200	€1,200,000	€3,000,000	1,492

Table 4: Example last-mile wholesale provider revenue growth potential

8   Summary

New revenue streams, service lifecycle acceleration, OPEX reduction and increased customer satisfaction are attainable for both retail and wholesale providers of data services through adoption of a standardized automated inter-provider business framework.

Examples show how ROIs within 12 months can be achieved through upgrading existing BSS-OSS system to support automation, or through use of third-party intermediate solutions that suit both large and small service providers.

Once a decision in principle has been made to automate its inter-provider business interfaces, a companion document to this one, also issued by MEF, called 'Business and Operational Aspects of LSO Sonata Implementation', describes the various factors to be taken into account until implementation has been completed.

9   About MEF

An industry association of 200+ member companies, MEF has introduced the MEF 3.0 transformational global services framework for defining, delivering, and certifying assured services orchestrated across a global ecosystem of automated networks. MEF 3.0 services are designed to provide an on-demand, cloud-centric experience with user- and application-directed control over network resources and service capabilities. MEF 3.0 services are delivered over automated, virtualized, and interconnected networks powered by LSO, SDN, and NFV. MEF produces service specifications, LSO frameworks, open LSO APIs, software-driven reference implementations, and certification programs. MEF 3.0 work will enable automated delivery of standardized Carrier Ethernet, Optical Transport, IP, SD-WAN, Security-as-a-Service, and other Layer 4-7 services across multiple provider networks. For more information, visit https://www.mef.net/ and follow us on LinkedIn and Twitter @MEF_Forum.

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