Cisco Crosswork Hierarchical Controller benefits

The foundation for the converged SDN transport network

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Executive Summary

Intelligent automation is a pre-requisite for CSPs to remain profitable and relevant. Without it, 5G and edge service will be operationally more expensive. Cisco Crosswork enables this automation.

Communication Service Providers (CSPs) are demanding lowered CAPEX spend on networks, lowered OPEX spend on running and maintaining their networks and improved customer experience from their networks. The whitepaper is aimed at senior decision makers within a CSP. It looks at how Cisco Crosswork Hierarchical Controller can automate the management of IP/Optical transport networks delivering quantitative benefits for all operators, be they mobile, fixed broadband or enterprise focused.

CAPEX Currently, many CSPs deal with time-sensitive applications and volatile traffic by massively overprovisioning their networks. This expensive, "heavy iron" approach may have worked in the past. But its costliness impacts profitability in the long run, especially as the gap between peak and mean traffic levels rises with dynamic network consumption patterns. Existing static and siloed approaches to planning the network will lead to increased CAPEX spend, not matched by revenue growth. Cisco Crosswork Hierarchical Controller can enable the CSP to right-size their network in line with service growth and SLA commitment.

OPEX Rapidly changing network demand patterns are impacting both end-user applications and existing SLAs. As network traffic continues to grow, network congestion and degraded network performance are occurring more frequently. Existing processes that rely heavily on complex and error-prone manual configurations are showing their limits, with increasing operational costs and the inability to scale. Cisco Crosswork Hierarchical Controller can enable the CSP to automate operational processes and scale these in line with service growth.

Revenue Businesses and end users now have very low tolerance for poor quality. CSPs are being constantly evaluated on their performance, and users have new tools for making those evaluations or sharing their appreciation. If unsatisfied with a service, they can easily complain on social media — potentially impacting the reputation of the CSPs — or simply just turn to a competitor. Existing approaches to network resilience do not support this more dynamic and demanding set of services and customers. Cisco Crosswork Hierarchical Controller can enable the CSP to effectively manage network resilience for all types of service.

Appledore Research have identified annual benefits, from deploying Cisco Crosswork Hierarchical Controller at a national mobile/fixed operator, of **$41.1 million per year**. The operator is a national network that supports 17.5 million mobile subscribers, 900,000 fixed broadband subscribers, 3500 SME customers and 700 large enterprise customers. The annual benefits represent **0.27% of this operator's annual revenue and 1.03% of its Opex**. It represents more than **$2 of annual benefit for each operator subscriber.**

Cisco Crosswork Hierarchical Controller was formerly Sedona Netfusion. As part of the Cisco Crosswork portfolio, it will importantly retain its vendor neutrality within a wider Cisco automation portfolio.

Benefits Summary

In simple terms the benefits analysis for Cisco Crosswork Hierarchical Controller (figure 1) are split as follows:

- CAPEX savings of around $8.9 million per year

- OPEX savings from design activities of around $1.8 million per year

- Opex savings from troubleshooting activities of around $5.9 million per year

- Revenue growth opportunities of around $24.6 million per year

Figure 1: Annual benefits from Cisco Crosswork Hierarchical Controller split by benefit category
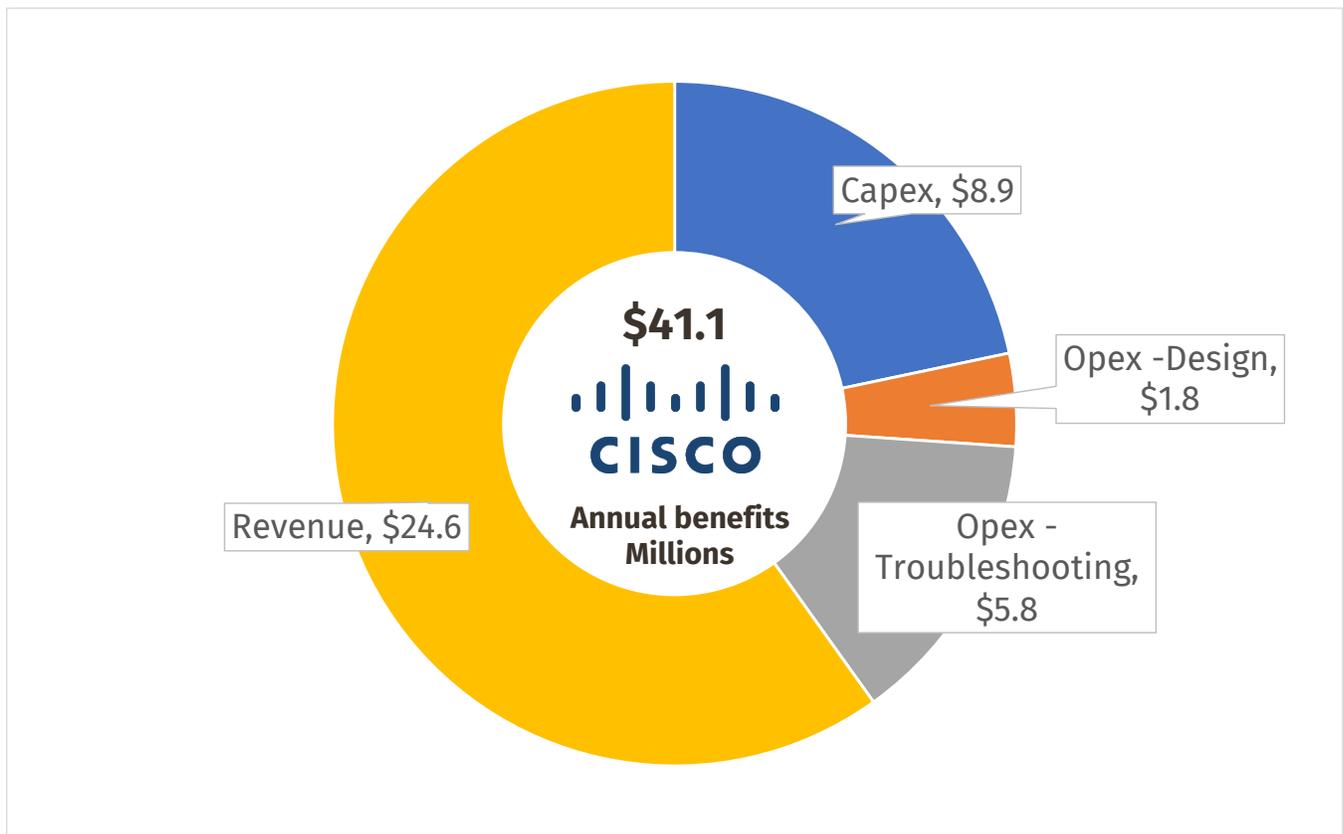
Source: Appledore Research

Based on a taper of benefits in first six months, we estimate an accumulated benefit of $113 million over a three-year ROI period (Figure 2).

The breakdown of CAPEX savings and revenue growth are given in figure 3 and 4.

Figure 2: Accumulated benefits over three years

	Year 1	Year 2	Year 3
■ Revenue	18.5	43.1	67.7
■ Opex -Troubleshooting	4.3	10.1	15.9
■ Opex -Design	1.4	3.2	5.0
■ Capex	6.7	15.6	24.5
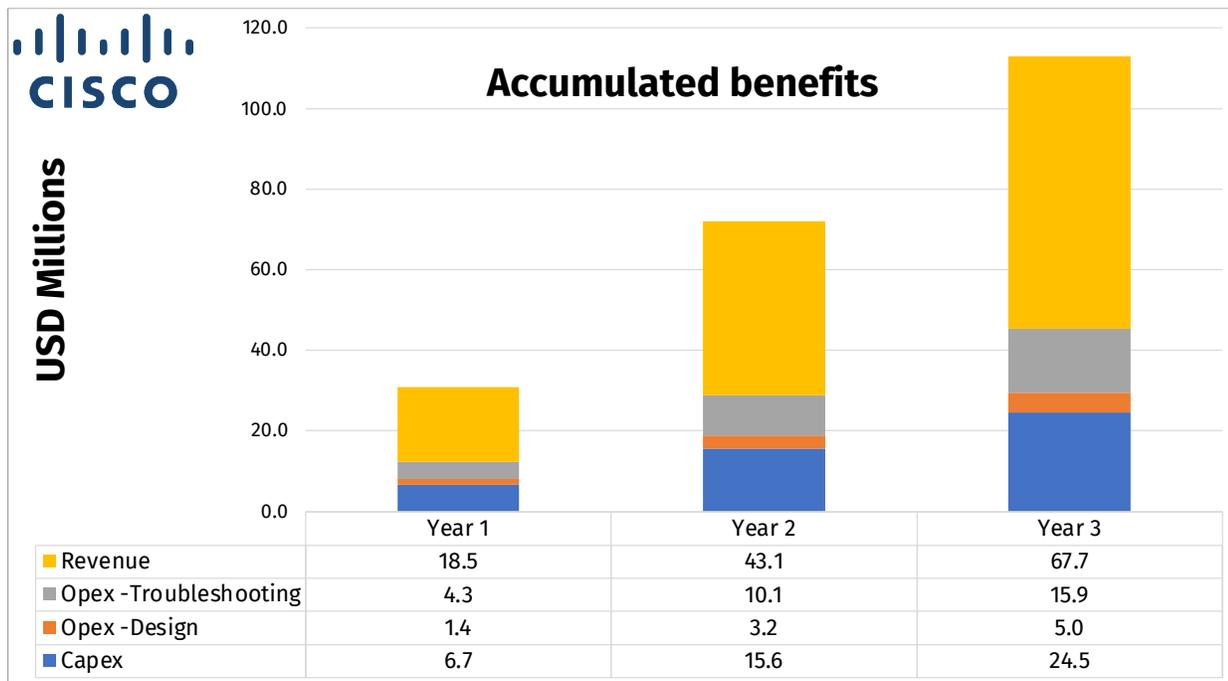
Source: Appledore Research

Figure 3: Annual CAPEX benefits by category

Optimized parts warranty, $513,310

Multi Layer Restoration, $854,031

$8,919,202

Annual CAPEX saving

Optimized procurement (Cheaper equipment), $4,811,228

Optimized Planning (Hotter Network), $2,740,633
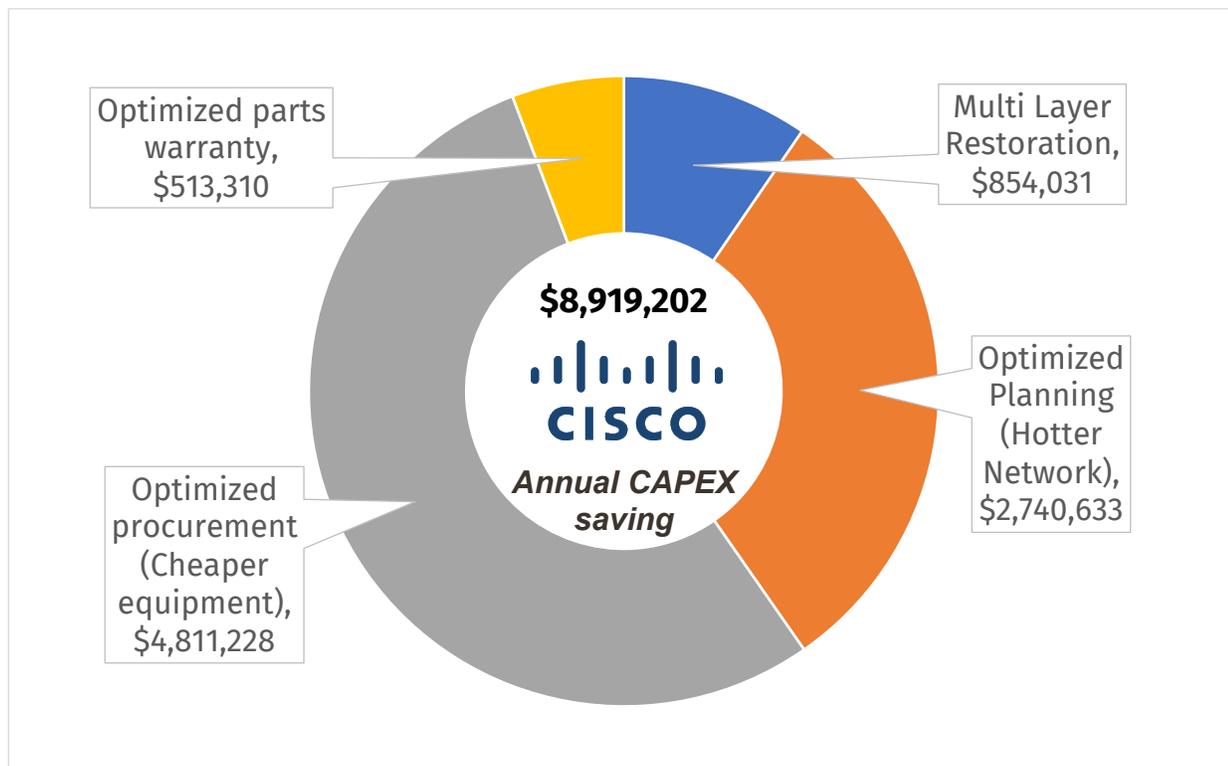
Source: Appledore Research

Figure 4: Annual Revenue Impact by category
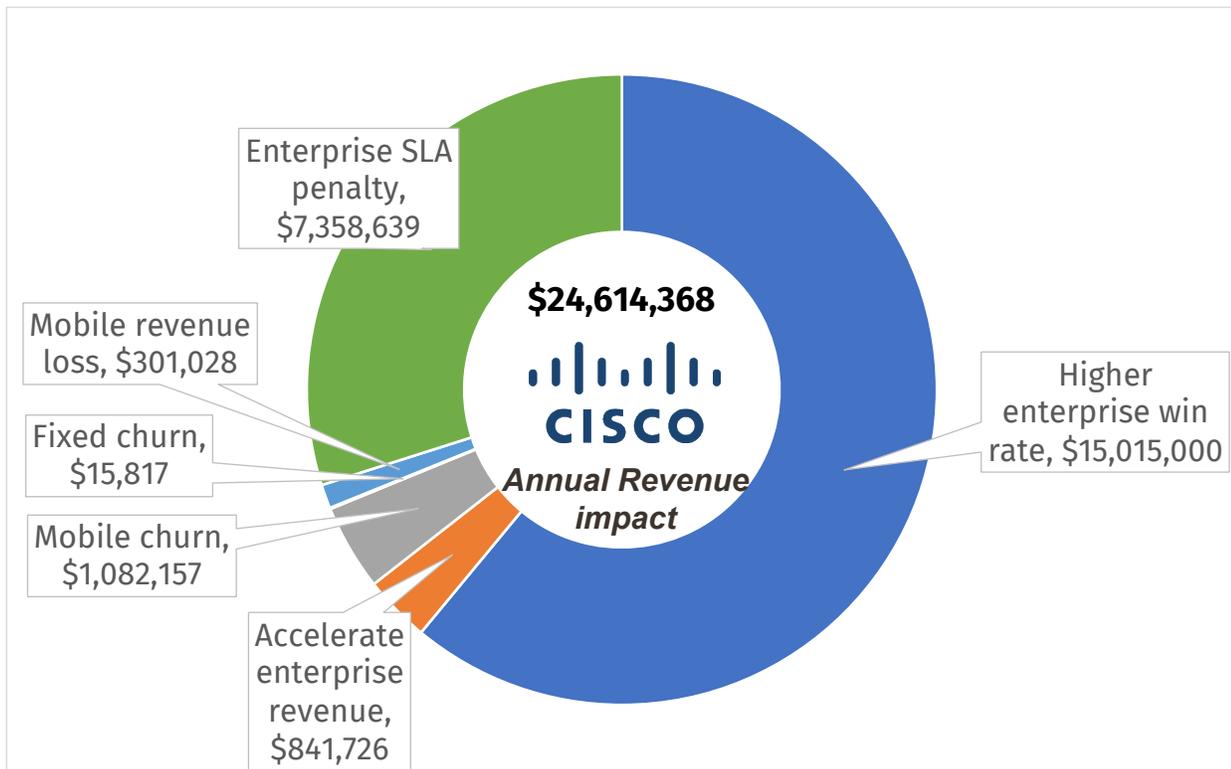
Source: Appledore Research

Full details about the benefits analysis and the model used are given in the annexes at the end of this document.

All figures in the document are expressed in USD ($).

Now part of Cisco Crosswork portfolio

Cisco [Crosswork Hierarchical Controller,](#) formerly Sedona Netfusion, is now part of a wider portfolio of Cisco products focused on automation and autonomy in converged SDN transport networks. The Sedona acquisition forms part of Cisco's ambition to lead the "Internet for the Future" with silicon, routing, optical and automation. Cisco [Routed Optical Networking](#) aims to enable simplified, converged IP and optical networks, with pluggable coherent optics and automation that can operate at mass-scale with less cost. Crosswork Hierarchical Controller will complement Cisco Crosswork Network Controller helping customers operate an efficient multi-vendor network and leverage the advances provided by Cisco's Routed Optical Networking.

Why Cisco Crosswork Hierarchical Controller?

In carrying out the ROI analysis for Cisco Crosswork Hierarchical Controller a large number of system capabilities were identified that can ultimately affect earnings drivers. These have been summarized in the next sections few functions and their user stories that we believe uniquely distinguish Cisco Crosswork Hierarchical Controller.

Support for automation

"Closing the loop, between fulfilment and assurance, is critical for automation"

Supporting services with demanding SLAs (in terms of hard latency limits and high resiliency, such as some of the 5G services) automation is critical. Cisco believes that closing the loop, between fulfilment and assurance, is critical for this automation. They have recognized the need for both assurance and fulfilment to share the same underlying management framework, maximizing the opportunity for common automation and ensuring that all engineers and operations staff have a common view of the transport network.

Cisco Crosswork Hierarchical Controller can ensure that proactive and automatic remedial actions can occur when an SLA is no longer valid, not when it is violated by a fault. For example, when a service is rerouted due to a failure or maintenance activity, and no longer meets the latency SLA needed for the application to work properly, a new optimal path should be automatically found for it and the service rerouted to meet the SLA. If no such path can be found, Cisco Crosswork Hierarchical Controller can raise a warning, so that the operations team is immediately aware of the issue and can proactively engage with customer, rather than waiting for the customer to complain.

Inventory accuracy

"An accurate inventory is a pre-requisite of network automation"

Cisco Crosswork Hierarchical Controller reads and derives all network inventory data from the network itself. It is not based on manually fed, and therefore erroneous and outdated, inventory systems. This enables closed loop operation, without manual intervention, since the likelihood of performing actions that are of touch with the actual network state is all but eliminated.

Understanding the device-level inventory is insufficient for network automation. Only with an accurate understanding of how everything connects to everything else, namely a layered topology model of the network.

Cisco Crosswork Hierarchical Controller derives this topology from the network as well, using sophisticated algorithms for the automatic stitching together of the IP and optical switching layers discovered from the network. This enables it to have a fully accurate picture of the transport network at all layers and across all vendor domains.

Figure 5: Cisco Crosswork Hierarchical Controller visualizing and managing across complex dependencies abstracted across multiple cloud technology layers
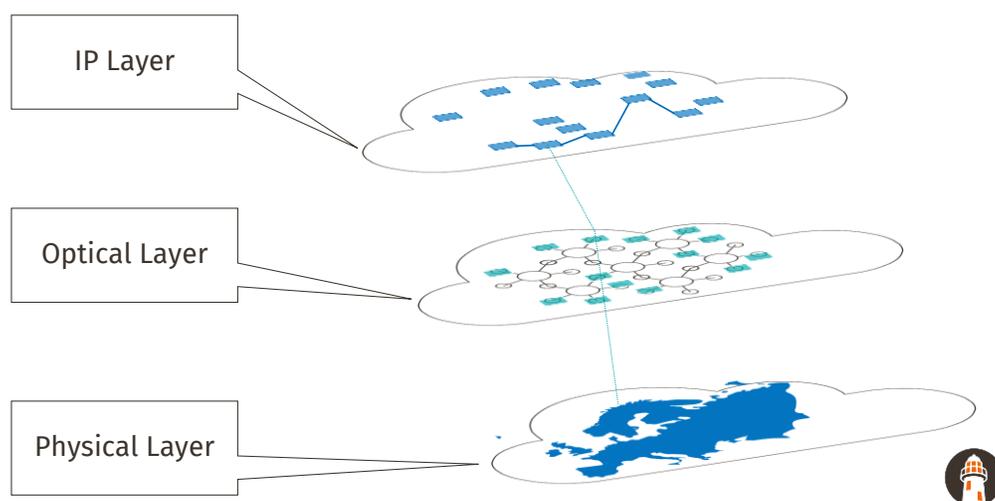
Source: Appledore Research

By contrast typical cross layer inventories, used by many operators are often 70% or less accurate. This lack of accuracy manifests itself in all processes associated with the transport network:

- Cross layer designs can often not be correctly protected, with consequences for SLA breach during network failure

- Cross layer designs can often be found to be not implantable and requiring rework

- Cross layer designs can often be found to require the dispatch of field force and truck rolls

- Lack of trust in network accuracy means that planning and operational staff take more conservative decisions in terms of levels of capacity overbooking in network with higher CAPEX.

Enabling proactive management of network

"Only through proactive management of the network can operators achieve and maintain the tight SLAs demanded by new 5G applications"

Networks inherently change due to the design of new services, troubleshooting remedial actions and network growth.

In a largely manually driven operational environment, with siloed planning, design and troubleshooting teams, it is highly likely that over time service implementations will diverge from their original optimal design. This can manifest itself in two distinct ways, both of which ultimately result in forms of customer service degradation or faults:

- First, network change (or even lack of visibility at time of design) can lead to designs where the resilience of the service is not in place, with catastrophic consequences in the event of a network failure.

- Second, network maintenance or network evolution can cause service designs to become sub-optimal with higher levels of latency and higher hop counts, or usage of hotspots. In the event of network failure these can become sub-optimal with SLA breaches.

Without an accurate view of the complete transport network, the typical operator is not able to identify these problems in advance, meaning that remedial action is reactive at time of the fault, with costly audits afterwards to address network vulnerability.

Cisco Crosswork Hierarchical Controller, with its complete and accurate view of the transport network, and automated analysis of this network, can enable proactive identification of both network vulnerabilities and the opportunity for service optimization to meet SLA. This can be achieved on a regular, even daily basis feeding into a reduction of high priority faults as well as a reduction in SLA costs and customer churn costs.

Vendor independence

"Cisco Crosswork Hierarchical Controller remains network vendor independent"

The transport network is a potentially highly competitive market with the opportunity for procurement from multiple vendors across IP and optical switching layers. However, often the overlaid management systems provided by these vendors can lock in vendor choice (it's too difficult to add in another management system and its associated processes). This can manifest itself in a premium price from incumbent vendors. Cisco Crosswork Hierarchical Controller was developed independently of network vendors, including Cisco, by Sedona. Retaining this vendor independence is seen as a critical capability for the Cisco Crosswork Hierarchical Controller. With continued independence from vendor and overlay management systems, the solution can continue to remove this premium allowing true vendor choice in any procurement. Continued vendor independence allows Cisco Crosswork Hierarchical Controller to work well with all vendors without fear of competition with their main business.

Vendor independence also allows Cisco Crosswork Hierarchical Controller to better align with the CSP goals and optimize the network without a conflict of interest that equipment vendors would have, were they to implement the optimization function.

Customer viewpoint

"Cisco Crosswork Hierarchical Controller supports the voice of the operator"

The multi-layer/multi-vendor transport network has many opportunities for more efficient hotter networks. However, this is not necessarily in line with the interests of the transport network equipment vendors. where hardware sales form the NEP major source of revenue, and with management systems usually bundled with hardware sales, it is possible that these management systems will not be best incentivized to give the optimum network utilization. As part of Cisco Crosswork, the Sedona NetFusion solution can remain completely vendor independent, with no hidden hardware agenda and can maximize the efficiency of the whole transport network. Cisco Crosswork Hierarchical Controller can better align with the CSP goals and optimize the network without a conflict of interest that equipment vendors typically have.

Warranty

"Cisco Crosswork Hierarchical Controller supports the operator in only taking warranty and parts assurance where it is actually needed"

Warranty and spare parts SLA management is a key ongoing cost for a transport network operator. Network vendors will charge by default for warranty and spare parts based on the hardware purchased rather than its usage.

Without an accurate view of the network and the services that run on it, it is often easier for an operator to warrant the whole network and to be conservative in terms of network locations where this warranty and/or high SLA spare parts supply is not required. Cisco Crosswork Hierarchical Controller, with its complete view of the transport network and the services (and SLAs) associated with them, can allow an operator to tailor warranty and spare parts SLA management to the actual risk in the network. It also allows this to be changed iteratively as the network evolves, rather than based on a static historic view of the network.

5G demands automated and efficient transport networks

5G presents a revolutionary opportunity for Communications Service Providers (CSPs) to increase earnings, accelerate service innovation and reduce costs. Next generation networks, including 5G, are characterized by their increasingly dynamic nature. However, this comes at the cost of increased operational complexity and network capacity variability. By leaving things as they are, CSPs are faced with either an exponentially rising operational and capital cost, as more services are introduced or instead will be forced to limit service innovation to allow existing operational processes to continue working; effectively "nailing down" the new technology.

Figure 6: 5G and Next Generation Networks; increasingly dynamic networks.
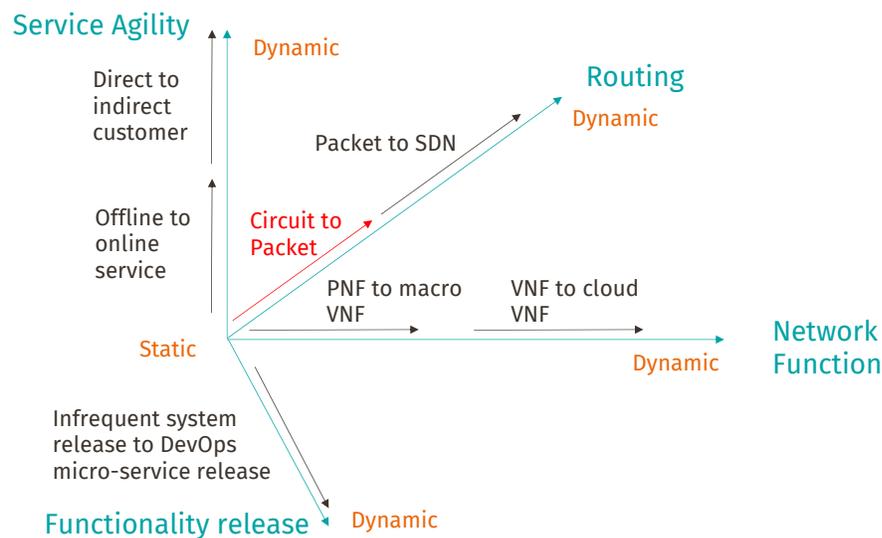
Source: Appledore Research

5G will require operationally efficient, automated and dynamic transport networks to enable the new opportunities offered by 5G. Cisco Crosswork Hierarchical Control can enable this efficient transport network.

The reality of most 5G deployments today is that they remain 4G+, with increased RAN capacity enhancement tied to an existing 4G EPC. However, this will change in the future with:

- The introduction of cloud native 5G standalone core.

- The disaggregation of RAN with vRAN, and ultimately Open RAN.

- The increasing placement of edge computing loads onto which 5G traffic will need to terminate.

This will drive a set of changes to the transport network that are illustrated in the figure below.

Figure 7: The transformed 5G/Edge transport network

Today's Transport Network

Low meshing
High Tree
Low dynamics

Highly meshed network

Metro separated limited interconnection

Semi-static long-lived connections

Majority of traffic NS tree from metro to core

Some meshing
Mostly Tree
Low dynamics

Increasing traffic EW traffic from metro to metro or via regional

Tomorrow's 5G/Edge TransportNetwork

5G Increasingly dynamic connections

Metro and regional networks highly meshed to support 5G/edge

5G Metro interconnection growing EW traffic

Metro, Regional, National, Edge

Source: Appledore Research

Today's 5G transport network

The existing transport network largely supports semi-static services for 4G, fixed broadband and enterprise services. These services mainly travel from the edge of the network to the center of the network (North-South in data center terms). Early versions of 5G will continue this network structure, but with increasing needs for more capacity and the need to support more densely distributed microcells.

The underlying regional and metro networks provide a simple access tree structure with high degrees of meshing only occurring in the national/core network. In this scenario transport complexity is largely limited to the national/core network, allowing existing siloed, operational processes to remain possible (if not optimal as is seen in our analysis above).

Tomorrow's 5G network

In the longer term, 5G will move away from this edge to central routing, with the distributed functions throughout the network (to support latency and other requirements). 5G will also increasingly deploy multiple network slices across the transport network dedicated to specific new use cases. This will increase the complexity of managing and sizing the transport network. 5G will also introduce more edge node to node connectivity (East-West traffic in data center terms) which adds complexity and diversity to routing in the network.

The future 5G transport network will need to support connectivity services that are increasingly dynamic, and where increasing amounts of traffic travel between edge locations (East-West in data center terms). To support this, the underlying regional and metro networks will become increasingly complex and meshed, with increasing levels of direct interconnection between metro and regional networks. In this scenario, network complexity is across the whole transport network. Operational processes need to scale to this new level of complexity. Capital expenditure continues to need to be optimized

The future of 5G requires the move to an integrated and agile transport network, with new processes and approaches. Automating the wrong siloed manual process goes nowhere and will block benefits, it is very easy to fall back on existing network operational approaches and lock new technologies, like 5G, into the processes of the past.

Cisco Crosswork Hierarchical Controller can provide the foundation for this automated and efficient 5G transport network. In particular, it can enable an operator to scale their operational processes without the need to grow headcount and/or limit the benefits of 5G.

Conclusion

Cisco Crosswork Hierarchical Controller is a strong solution that can enable CSPs to efficiently build and operate transport networks. It delivers strong customer experience throughout the business. Cisco Crosswork Hierarchical Controller has demonstrable benefits in terms of direct network CAPEX savings, as well as engineering and operational OPEX savings. A strong transport network, enabled by Cisco Crosswork Hierarchical Control, can also produce significant opportunities for revenue growth.

Cisco Crosswork Hierarchical Controller is a necessary foundation for future dynamic 5G and edge networks, providing efficient dynamic transport networks, underpinned by automation at scale. As part of Cisco's Crosswork portfolio it will be an important enabler of truly autonomous converged SDN transport networks.

For further information on Cisco Crosswork Hierarchical Control see cisco.com/go/crosswork

As with all ROI analysis, a generic analysis can take you only so far. ROI analysis is all about you the customer and your context and ambition. Behind this generic analysis is a strong ROI model that can be tailored to your exact circumstances. Cisco Crosswork Hierarchical Controller ROI analysts can work with you to better understand your transport network situation and the potential benefits that Cisco Crosswork Hierarchical Controller can bring to your business.

Annex - ROI methodology and model

The whitepaper looks at the benefits from adopting Cisco Crosswork Hierarchical Controller to support multi-layer and multi-domain management of the transport network. The benefits analysis is based on Appledore's 3D ROI model which maps systems and capabilities to how they affect business processes and business functions and ultimately performance metrics and earnings drivers.

The whitepaper focuses on the benefits of Cisco Crosswork Hierarchical Controller and does not consider the costs of implementing the Cisco Crosswork Hierarchical Controller solution.

Figure 8: Appledore 3D ROI model
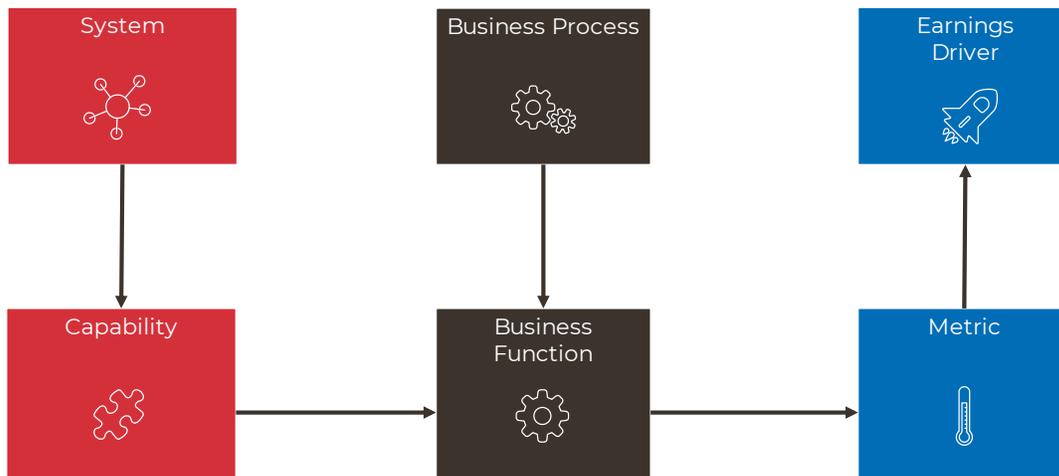
Source: Appledore Research

The following figure illustrates the underlying flow that drives this typical operator benefits analysis for Cisco Crosswork Hierarchical Controller.

Figure 9: Benefits analysis flow
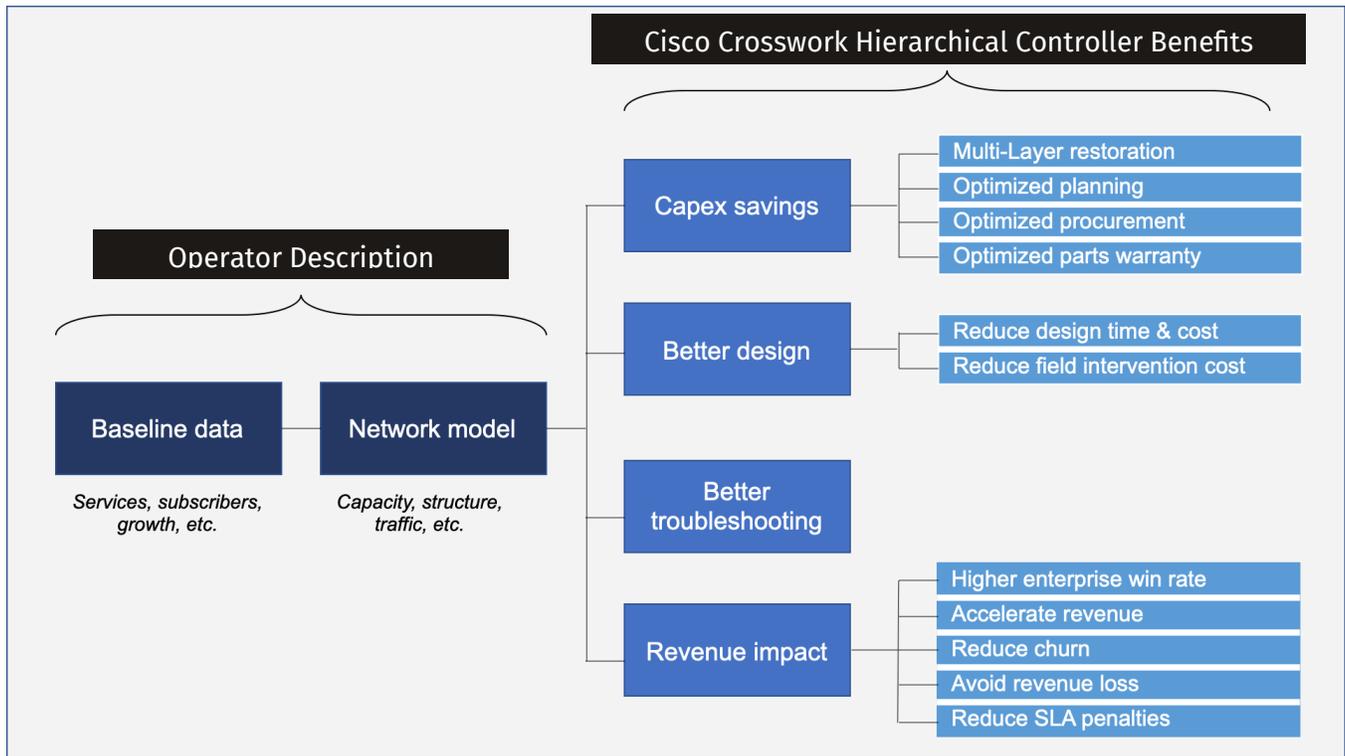
Source: Cisco Crosswork

Business background

The benefits analysis is based on a real-world benefits analysis for a typical large European mobile/fixed operator. Numbers were derived from a network model based on information provided in company financial reports, from interviews with the Cisco Crosswork Hierarchical Controller team, and from general industry metrics which form part of the Appledore 3D ROI.

The Cisco Crosswork Hierarchical Controller benefits analysis is based on a network capacity demand model that was seeded from operator financial reporting and generally available government and regulator information. In making this published benefits analysis we have used publicly available figures from UK and Vodafone UK. These are combined with industry metrics from Appledore 3D ROI experience and Cisco Crosswork Hierarchical Controller experience.

In making the benefits analysis the following figures have been used to calculate the overall return and Net Present Value (NPV):

Cost of Capital	5%	
Start Month for benefit	1	months
Number of Months for full benefit	6	months
Benefit Period	36	months

The following figures for operational costs have been used in the benefits calculation

| Ops labor cost (weighted average)	$36,000	USD/year
Eng. labor cost (weighted average)	$60,000	USD/year
Reactive Truck roll cost	$500	USD

Customers, Services and Growth model

The benefits analysis is based on a typical operator providing four generic types of service: Mobile; Fixed Broadband; SME WAN and Large enterprise WAN. Figures for mobile service and fixed broadband are primarily based on average figures for year (Q3 19/20 – Q2 20/21) for Vodafone UK presented in Vodafone Group's H1 20/21 report. Figures for enterprise customer numbers are based on the typical operator having approximately 10% penetration of UK enterprise market, using UK government and regulator figures from Ofcom Communications Market Report 2019. The analysis does not use non-public knowledge of the real Vodafone UK network.

	Mobile	Fixed BB	SMEs	Enterprises
Subscribers	17,500,000	900,000	3,500	700
Subscriber growth/year	2.0%	5.0%	0.0%	0.0%
Subscriber data growth/year	25.0%	18.0%	20.0%	

These figures are used to drive estimates for the amount of transport network capacity that is required to support mobile, fixed broadband and enterprise services.

Network Structure Model

Figure 10: Today's typical network and service structure
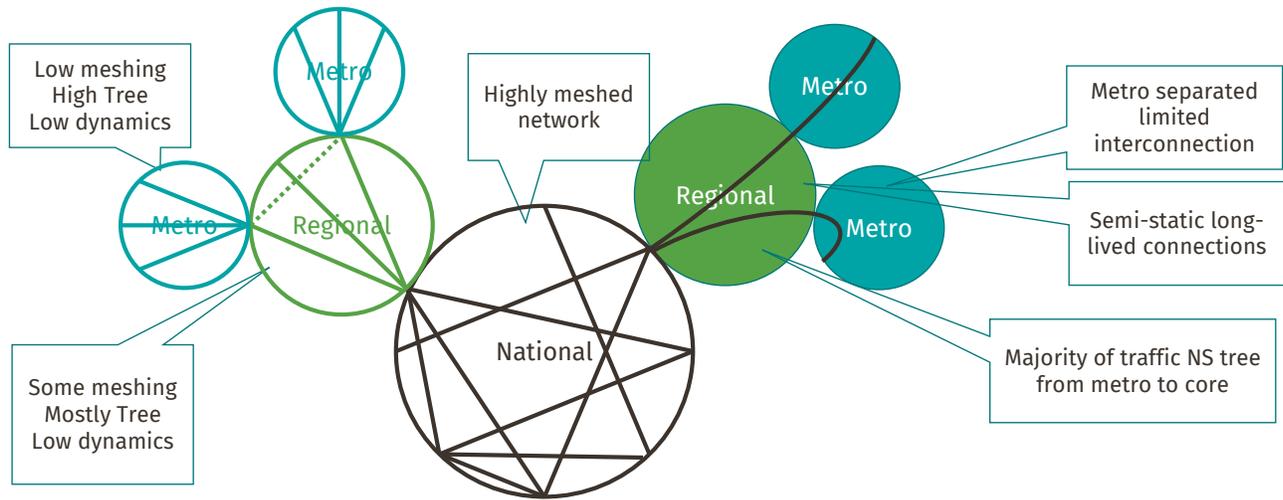
Source: Appledore Research

The benefits analysis is based on a simplified network model, with three levels of network. A highly meshed national or core network and predominantly tree networks in the regional and metro networks. The national and regional networks are assumed to have both optical switched and IP networks, with the metro networks assumed to be IP only connectivity. Network capacity (and cost) is based on IP ingress ports into each network level, and internal optical backhaul ports within each level. The model does not account for intermediate device costs within each level and is therefore conservative in estimation of benefits.

	National	Regional	Metro	Total
Total network traffic (GBps ports)	52,513	62,956	101,179	216,648
Annual traffic increase (GBps ports)	5,678	10,195	19,453	35,326

Network Costs	National	Regional	Metro
Cost per 1Gbps tributary capacity	*$200*	*$150*	*$750*
Cost per 1 Gbps optical uplink capacity	*$150*	*$150*	*$150*

Annex – CAPEX Business benefits

In this section we outline specific CAPEX benefit calculations for our typical CSP, based on a real-world network scenario described above.

Figure 11: Annual CAPEX benefits by category

Optimized parts warranty, $513,310

Multi Layer Restoration, $854,031

$8,919,202

Optimized Planning (Hotter Network), $2,740,633

Optimized procurement (Cheaper equipment), $4,811,228

Annual CAPEX saving
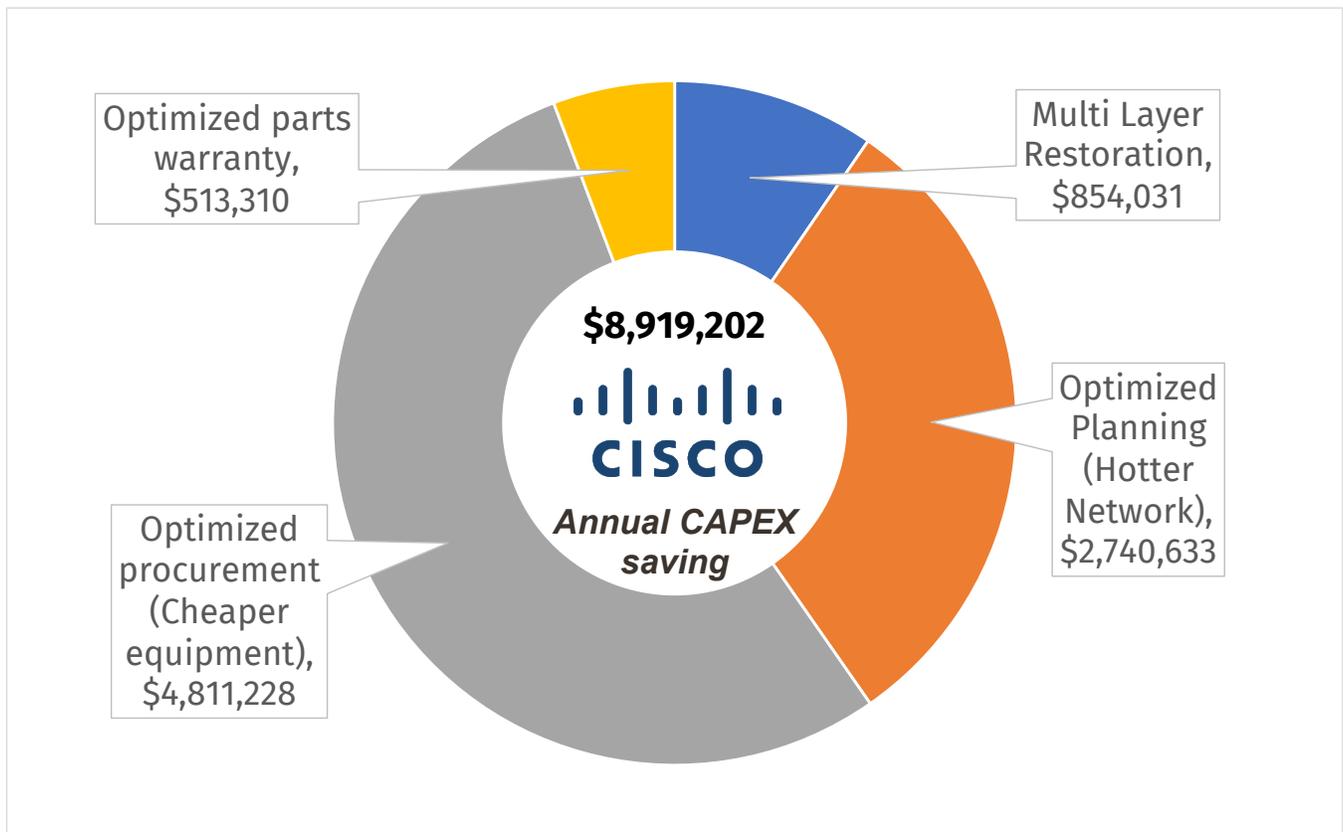
Source: Appledore Research

Multi-layer restoration

In an IEEE paper, potential savings for applying multi-layer packet and optical protection were described for Deutsche Telekom and Telefonica. In the figure below, the savings due to different levels and combinations of cross layer protection are shown. Multi-layer bypass optimization (MLBO); Multi-layer restoration from optical failure (MLR-O); Multi-layer restoration from MLR from IP port failure (MLR-P).

An average saving of port capacity of 34% was identified as being possible, by introducing proper coordination of IP and switched optical layers restoration strategies. A further 15% saving of port capacity was possible with the introduction of advanced floating port restoration strategies between IP and optical.

Figure 12: Relative number of interfaces needed when designing a network
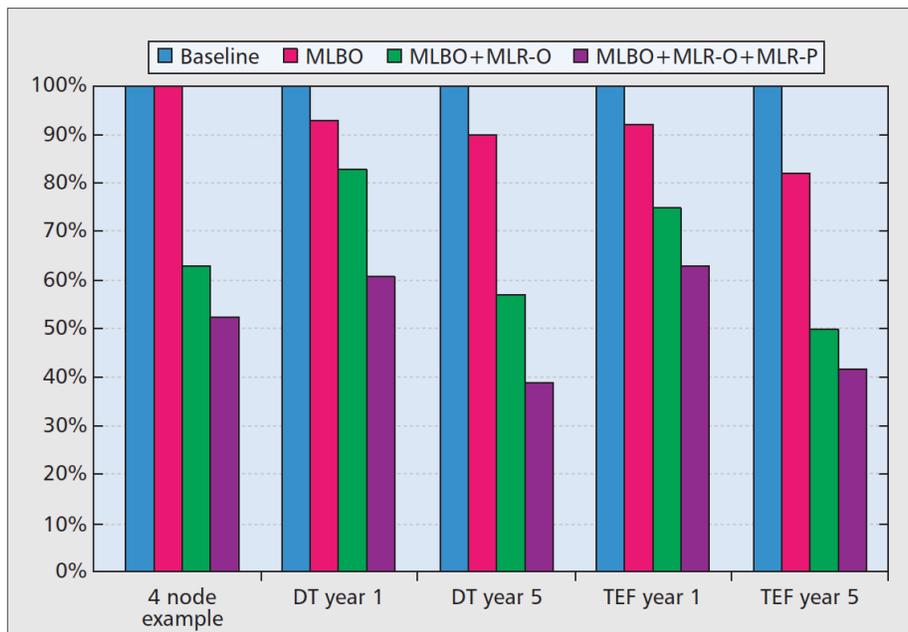
Source IEEE

Floating port backup provides higher utilization by freeing up device resources, with one spare backup port protecting N live ports. Floating port restoration gives CAPEX saving beyond those

For purposes of the ROI, we have limited the benefits to simple coordination of multi-layer protection (baseline to MLBO+MLR-O). Benefits would be approximately 1.5 times if full floating port could be implemented. Cisco Crosswork Hierarchical Controller supports this, however the operational barriers to CSPs trusting this form of protection are felt to be too high currently, meaning the additional benefit is academic in most operators worldwide.

Based on the better coordination of IP and optical restoration strategies in network growth, Cisco Crosswork Hierarchical Controller can enable an operator to achieve savings of $854,031 per year.

Optimized cross-layer planning

Cisco Crosswork Hierarchical Controller, by enabling a complete and accurate view of the network and the services that run across it, enables an operator to trust the overbooking of capacity onto that network. It also enables an operator to adopt a more agile proactive approach to capacity increase in line with service demand. Through this trust and proactive approach an operator can lower CAPEX by running network hotter. Google claimed that with an international inter-data center SDN network it could achieve 80% underlying capacity utilization. In comparison many operator networks are often only 40% utilized, leaving a large opportunity for network heat. Based on an increase of 5% in network utilization in network growth, Cisco Crosswork Hierarchical Controller can enable an operator to achieve savings of $2,740,633 per year.

Optimized procurement

As noted above, Cisco Crosswork Hierarchical Controller's continued vendor neutrality can drive lower equipment costs. Based on customer experience, Cisco Crosswork Hierarchical Controller believe that vendor neutrality (and the ability to avoid incumbency lock in) can drive savings of between 10 and 20%. With a 15% saving in network cost, based on network growth, Cisco Crosswork Hierarchical Controller can enable an operator to achieve savings of $4,811,228 per year.

Optimized parts warranty

As noted above, Cisco Crosswork Hierarchical Controller can better align the warranty and part management for a network with the services and topology of the network. The ability to align warranty with areas of risk and to reduce it in areas of available alternate capacity saved 0.4% of the total installed base cost. Based on the network growth, Cisco Crosswork Hierarchical Controller can enable an operator to achieve savings of $513,310 per year.

Annex – OPEX Business benefits

In this section we outline specific OPEX benefit calculations for our typical CSP, based on a real-world network scenario described above.

Engineering Order – Better design and implement cost

Cisco Crosswork Hierarchical Controller can reduce the design and implementation time and effort to achieve an engineering order and gives an engineering cost saving of $1,558,860 per year. In estimating opex savings we have assumed that a CSP will initiate new network engineering orders in line with capacity growth, driven by customer metrics.

Lower operational cost comes from:

- Automated design for all orders, replacing the need to manually design an order based on referencing multiple systems.

- Automated implementation of designs on SDN enabled networks.

- No need for redesign and implementation of orders due to inaccurate inventory making original design wrong.

Engineering Order – Lower field intervention

By providing a complete and accurate view of current network across layers, Cisco Crosswork Hierarchical Controller enables engineering teams to increase the likelihood of achieving a solution without a truck roll and field work. A typical truck roll costs about $500. Using ticket information for a typical transmission network and assuming a 10% avoidance of truck rolls gives an operational saving of $245,104 per year for engineering orders.

Operational trouble shooting - Better triage

Cisco Crosswork Hierarchical Controller enables the effective triage of Priority 1 and 2 tickets and the reduction of the actionable tickets by enabling rapid correlation of fault information and root cause analysis across layers and domains. This reduces the number of triaged tickets by nearly 13,000 per year with a saving in operational cost of triage of $584,950 per year.

Operational trouble shooting - Better remedial design and implement cost

Cisco Crosswork Hierarchical Controller can reduce the design and implementation time and effort to achieve a remedial design and gives an operational cost saving of $1,847,097 per year. In estimating opex savings we have assumed that a CSP will initiate new network engineering orders in line with capacity growth, driven by customer metrics.

Lower operational cost comes from:

- Automated design for all changes, replacing the need to manually design an remedial design based on referencing multiple systems.

- Automated implementation of remedial designs on SDN enabled networks.

- No need for redesign and implementation of changes due to inaccurate inventory making original design wrong.

Operational trouble shooting - Lower field intervention

By providing a complete and accurate view of current network across layers, Cisco Crosswork Hierarchical Controller enables operations teams to increase the likelihood of achieving a solution without a truck roll and field work. A typical truck roll costs about $500. Using ticket information for transmission network and assuming a 10% avoidance of truck rolls gives an operational saving of $3,338,550 per year for operational changes.

Annex – Revenue benefits

In this section we outline specific revenue benefit calculations for our typical CSP, based on a real-world network scenario described above.

Figure 13: Annual Revenue Impact by category
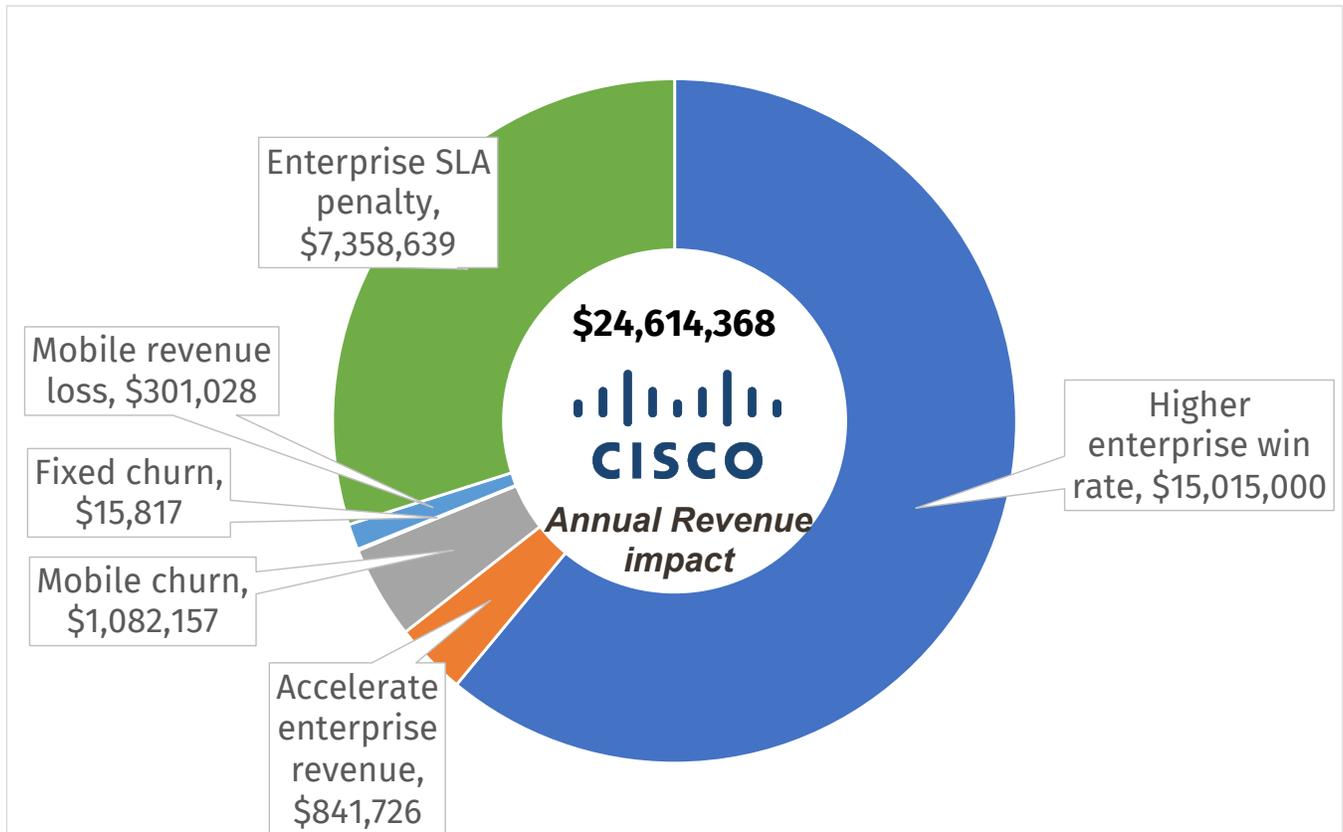
Source: Appledore Research

Increase revenue

Cisco Crosswork Hierarchical Controller's ability to fully automate the delivery of transport services enables an operator to provide online "Network as a service". Reducing the time between a service lead and service delivery increases the conversion rate for leads and enables increased market penetration. Based on a doubling of enterprise lead conversion, this gives an increase in revenue of $15,015,000 per year. This represents the most significant benefit from the implementation of Cisco Crosswork Hierarchical Controller. It reflects the major impact that automation can have on service delivery, and therefore the direct effect on customer provider choice.

Reduce enterprise SLA penalty payments

Priority 1 and priority 2 tickets are visible to customer in terms of experience of the network. For enterprise customers this results in service SLA penalty payments. Using industry estimates for SLA penalties (per event and per hour of service impact) we have estimated the lost revenue due to a typical network fault. Cisco Crosswork Hierarchical Controller by more rapidly diagnosing and

remedying Priority 1 and 2 tickets; and by reducing truck rolls and their associated lengthy MTTR gives a reduction of SLA payments figure of $7,358,639 per year.

Accelerate revenue

Cisco Crosswork Hierarchical Controller's ability to fully automate the delivery of transport services enables an operator to provide a service much quicker. Through faster delivery of enterprise services Cisco Crosswork Hierarchical Controller enables the revenue from a service to be recognized earlier. This gives an increase in revenue of $841,726 per year.

Reduce revenue loss through Churn reduction

Priority 1 and priority 2 tickets are visible to customer in terms of experience of the network. These therefore have an indirect effect on customer churn. Using industry churn averages and costs we have estimated the lost revenue due to customer churn (costed using customer acquisition cost and one year's ARPU). Cisco Crosswork Hierarchical Controller by more rapidly diagnosing and remedying Priority 1 and 2 tickets; and by reducing truck rolls and their associated lengthy MTTR gives a churn avoidance figure of $1,082,157 per year for mobile subscribers. In addition, this gives a smaller churn avoidance figure of $15,817 per year for fixed subscribers, where the churn dynamics are less.

Reduced revenue loss from lower MTTR

Priority 1 and priority 2 tickets are visible to customer in terms of experience of the network. These therefore have an indirect effect on the customer's ability to consume service. Using averages for customer phone usage we have estimated the lost revenue from a customer not being able to use service during a Priority 1 ticket and having 50% capability during a Priority 2 ticket. We have assumed that a Priority 1 or 2 ticket will affect the whole network associated with a regional area. Using this we derive a revenue loss figure of $301,028 per year for mobile subscribers, which represents revenue from services that were unable to be consumed during the network problem.

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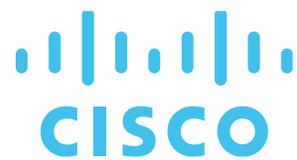
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