Mobile Backhaul Offer

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Global Service Provider Segment
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Service Provider Architecture
Cisco Service Provider
Service Centric Network

CXO Value Proposition
Industry Use Cases
Customer Value Journey
CX Lifecycle
Customer-Centric Multi-Domain Reference Architecture
Architectural Use Cases & Offers

Partner Ecosystem
Software Licensing Models

CIO/CXO/LoB
Telco Architect
Engineering & Operations

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Major Service Provider trends demand an Agile Infrastructure to survive.

Top Challenges Facing Service Providers:

- Flattening revenue
- Exponential traffic
- Complexity and Scale
Service Provider: Service Centric Network Value and Offers

- Industry expertise
- CXO messaging
- X-arch sales plays
- Reference architectures, journey, and offers

Agile Infrastructure
Cut costs, deliver services faster, increase adaptability & trust
- Topology Re-architecture
- Operations Re-Architecture
- Network Services Re-Architecture
- Workforce Re-Architecture

Next Gen Subscriber Services - TBD
Telco Data Center - Q3FY20
Service Centric Network - August 2019

- Simplifies network architecture, optimizes routing, and leverages SR/MPLS to align E2E traffic management with application needs
- Optimize the Network Architecture
- Expose Network Services Capabilities
- Automate all Aspects of the Network Lifecycle

Mobile Backhaul
Trusted Intelligent Peering
Software Defined Transport Network
Service Provider: Service Centric Network - Mobile Backhaul
Service Provider: Mobile Backhaul Value Proposition

Cisco Mobile Backhaul provides clear value to Service Providers.

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<tr>
<th>Lowers Cost</th>
<th>Future-proofs the network</th>
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<td>- Next-generation equipment lowers power consumption and cooling requirements.</td>
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<td>- Compact size leads to less real estate costs.</td>
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<td>- Network automation increases overall operational efficiency and reduces human errors.</td>
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<td>- Foundation for superior technologies in software-defined networks (SDN), segment routing and IPv6 - paving the way for the Service Centric Network.</td>
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<td>- Security hardening and trustworthiness embedded in every Cisco product</td>
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<td>- Automated network deployment and operation</td>
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<th>Supports Growth</th>
<th>Smart investment</th>
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<td>- Higher bandwidth equipment capable of supporting new-era services like augmented reality (AR), virtual reality (VR), and 5G business-to-business (B2B).</td>
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<td>- Key automation features that shorten deployment phase and time to revenue.</td>
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<td>- Choice of Cisco positively impacts service provider (SP) business outcomes: cost and growth</td>
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<td>- Commercial models (Vortex, EAs) that provide the right balance between CapEx and OpEx for SP in deals</td>
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Service Provider: Mobile Backhaul Overview

Cisco Mobile Backhaul Offer

1. Automation / Security
   - NSO + Crosswork + WAE + EPN Manager
   - Firewall + Duo + Stealthwatch + ISE

2. Network Infrastructure
   - IOS XE/XR
   - Fixed and modular cell site routers, pre-aggregation and aggregation routers

3. Services / CX
   - Plan, design, implement at scale with automation
   - Brownfield XE->XR migration

Target customers

This offer is appropriate for a number of customer situations:

- **Aging inefficient installed base**
  - Cisco (XE to XR upgrade)
  - Competitor (take out)

- **4G growth or 5G pre-build**
  - Continued 4G growth needs and added capacity for 5G deployments

- **Greenfield environments**
  - New start-up mobile providers

Business case

- Proof of concepts (POCs) and demos
- Commercial construct
- Validated design
5G Converged Transport Network Overview

- E2E Service Provisioning (NSO) and Path Computation with SLA (SR-PCE/WAE)
- Feature-rich service stack in L3VPN & EVPN
- Automatable & Programmable Segment Routing Transport

Platform:
- NCS 540
- NCS 560
- NCS 550
- ASR 9900
- NCS 5500

Network Elements:
- D-RAN
- LTE
- 5G NR
- C-RAN
- 5G NR
- Cloud RAN
- 5G NR
- RRU #1
- RRU #2
- RRU n
- Carrier Ethernet
- xPON

Access:
- Pre-Agg
- Midhaul
- Pre-Agg
- Midhaul
- Access
- Pre-Agg
- Access

Backhaul:
- Pre-Agg
- Midhaul
- Access
- Pre-Agg
- Access

Aggregation:
- Backhaul
- Edge
- Central DC
- Peering
- SR Core
- Internet

DCI:
- NCS 1004
- NCS 2000
- NCS 5500
- ASR 9900
- NCS 5500
Transport Network Fabric Evolution

Centralized Management, Leaner & Highly Scalable

Traditional Unified MPLS
- Operational complexity
- Integrated HW & SW
- Underlay scaling issues

Current SR-MPLS deployment with controller
- SR MPLS: optimised & leaner routing
- Centralised management & orchestration
- Distributed control plane
- Underlay scale issues

Future SRv6 deployment with controller
- All of SR-MPLS features plus
- Further simplification & enhanced scaling
- Programmable control plane
- Service chaining
- Massive underlay scale
Why Segment Routing

Leverage EVPN & L3VPN rich features
SR-TE steering for SLA-bound services
SRv6 service chaining for Far-Edge Enterprise serverless computing
NaaS with Flex Algo & EVPN slicing

Data plane monitoring & cumulative metric-bound SPF for SLA assurance
Massive SRv6 underlay scaling
TI-LFA & micro-loop avoidance for increased network availability
Tree-SID for leaner Multicast delivery

New Revenue
Automatable Architecture
Optimized TCO
Proven Integration

SRv6 in Transport, DC & Compute
E2E service turn-up with NSO & Traffic Engineering with SR-PCE/WAE
SRv6 network programmability & XR automation capability

Cisco leadership in SR
SR/MPLS deployment with over 200+ customers worldwide
Proven brownfield MPLS integration
Seamless SRv6 transition
Key Segment Routing + Automation Use Cases

Agile Service Provisioning
- Automatic network & services provisioning with NSO
- Outcome: Decrease time to revenue & increase service agility

Bandwidth & Path Optimization
- Sweat network links & optimize service network path
- Outcome: Run costly links hotter & increased user experience

Egress Peer Engineering
- BGP-aware SLA service for latency-sensitive Cloud SaaS app
- Outcome: Optimal service experience based on cost, latency & loss

Bespoke Services Provisioning
- SR/ACI + Automation network slicing
- Outcome: Network-as-a-Service revenue model
Built upon Cisco’s best-in-class
- Routing, Automation platforms
- Security: Protect Network, Applications, Customer Data
Service Provider: Mobile Backhaul Case Example

Winning solution
- Single vendor MBH
- WAN transport with NCS5500, Central DCs with ACI, Regional/Edge DC with Nexus9K, NFVI with Cisco VIM

How we won
- Executive-level engagement, Bridging
- Early engagement, consultant work with top talent in Cisco influencing future architecture design
- Proven ability and expertise of global deployment (especially, RJIO)
- End-to-end arch: IP transport, DC Fabric, NFVI, Virtualized Packet Core and Automation
- Substantial Capex optimization via CFP2 DCO differentiation

Cross-architecture 4G/5G MBH

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Service Provider: Mobile Backhaul License / Commercial Models

Vortex Flexible Consumption Model

Customer benefits

- Pay for use
  - Network ports

- Portability
  - Gen #1 line card
  - Gen #2 line card

Customer benefits:

- Reduce upfront capital up to 36%
- Utilize capital efficiently
- Protect your investment
- Embedded automation

Customer benefits:

- Pay for capacity only when needed
- Licenses float to where there is demand—plan your network, not your box
- Take licenses with you—separate capacity planning from hardware lifecycle planning
- Add features when needed without fear of being stranded on older hardware

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Service Provider: Mobile Backhaul Business Outcome Engagement

Commercial modeling

Please engage the Cisco sales teams to achieve the business outcome that you want.

- Customer-facing business cases

Benefits:
- Demonstrate lower upfront cost
- Year-by-year cost projections
- Model and compare multiple scenarios

TCO Summary Cumulative

Vortex TCO model for fixed NCS Nodes
- Supports: NCS5501, NCS5502, NCS55A1-24, NCS55A2-36 & NCS55A2z

Vortex TCO model for modular NCS Nodes
- Supports: NCS5504, NCS5508 & NCS5516

Vortex TCO model for NCS540 & NCS560
For more information

- For more information on mobile transport, backhaul, segment routing, please go to www.cisco.com/go/5g-transport
- For more information on the Cisco Knowledge Network Sessions and Programs please go to: https://www.cisco.com/c/m/en_us/network-intelligence/service-provider/digital-transformation/knowledge-network-webinars.html