

## Routing Trends

# Similar to switching, 1Q23 routing growth acceleration driven by backlog drawdowns

Industry Overview

### Elevated growth, driven by drawdown of backlog levels

The Service Provider (SP) routing market ex-China grew 19.6% YoY in 1Q23, above the 3.5% growth recorded in 1Q22, in-line with the peak rates of 12%-27% seen in early 2021. Improvements in the supply chain are driving accelerated backlog drawdowns, and growth is also supported by investments in mobile xHaul and coherent optical routing. The Core routing market typically underperforms the Edge routing market and 1Q23 saw a similar trend with Core routing up 16.8% YoY vs. 20.6% growth in Edge. We expect the routing growth to moderate by 1Q24 and note that between 2012-2020, the routing market exhibited almost no growth, with capacity demands absorbed by price erosion and product enhancements. We exclude China from our analysis as most Western vendors do not sell into the region.

### Core routing up 16.8% YoY, above historical levels

The Core routing market is mostly driven by bandwidth demand, and we believe the market remains challenged longer-term with price erosion outpacing bandwidth-related unit growth. However, the segment grew 16.8% YoY in 1Q23, above 1Q22's 9.3% growth, supported by backlog drawdown, as well as 400G deployments, Cloud provider demand, and capacity additions by Cable MSOs and SPs. Cisco continues its share recovery, with an impressive 570bps YoY increase in market share in 1Q23. Juniper's market share continues to deteriorate, down from 24.8% in 1Q22 to 18.3% in 1Q23, while Nokia grew its share from 2.7% to 3.8%, respectively. Huawei (ex-China) continues to lose share, from 9.6% in 1Q22 to 8.7% in 1Q23, as FX headwinds are impacting the company's overall gain in the last few quarters and Western countries continue to impose restrictions on routing projects with Chinese vendors. Additionally, Huawei has been reluctant to migrate towards the coherent optical routing trend.

### Edge growth driven by bandwidth demand/service element

The Edge routing market grew 20.6% YoY to 75% of the total market ex-China, supported by bandwidth demand and a large service element. We believe better availability of components will continue to drive growth, but we expect the market to decelerate to low-single digit growth once backlog levels are depleted, likely in 4Q23, as COVID-related buildouts and 5G projects are slowing down and/or being delayed. Cisco's market share continues to decline, going from 32.1% in 1Q22 to 30% in 1Q23, with Nokia as a close second player with 29.4% share. Juniper continues to recover from previous share losses, with 2Q23 share at 16.4% vs. 13.1% last year. Like the Core market, Huawei (ex-China) continues to lose share globally, down from 18.5% in 1Q22 to 16.1% in 1Q23. Small players that only participate in 5G aggregation, such as Ciena and Ericsson, show share gains, albeit off a low base, increasing from 1.4%/1% in 1Q22 to 2.9%/1.6% in 1Q23, respectively.

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### Glossary

MSO = Multiple System Operator

SP = Service Provider

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# Routing Market Overview

We present the total market data first, followed by the Core and Edge segments. Note: figures are ex-China.

## Total Routing Market Trends

### Exhibit 1: Snapshot of the Total Routing Market ex-China

The total routing market ex-China grew 19.6% in 1Q23, supported network capacity expansion

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23		CY19	CY20	CY21	CY22
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec					
Revenue (\$mn)	\$2,104	\$2,255	\$2,216	\$2,366	\$1,733	\$2,099	\$2,126	\$2,553	\$2,213	\$2,355	\$2,384	\$2,713	\$2,291	\$2,534	\$2,606	\$2,851	\$2,741					\$8,940	\$8,511	\$9,665	\$10,282
QoQ % Chg	-17.2%	7.2%	-1.7%	6.8%	-26.8%	21.1%	1.3%	20.1%	-13.3%	6.4%	1.2%	13.8%	-15.5%	10.6%	2.8%	9.4%	-3.9%								
YoY % Chg	4.1%	4.9%	-1.9%	-6.9%	-17.6%	-6.9%	-4.1%	7.9%	27.7%	12.2%	12.1%	6.2%	3.5%	7.6%	9.3%	5.1%	19.6%					-0.3%	-4.8%	13.6%	6.4%
Revenue Share																									
Huawei	12.8%	15.7%	16.1%	17.8%	16.7%	17.6%	10.5%	24.2%	15.3%	18.0%	17.3%	18.7%	16.2%	19.5%	14.8%	17.1%	14.3%					15.7%	17.6%	17.4%	16.9%
Cisco	41.5%	37.9%	37.2%	34.5%	36.0%	36.3%	39.9%	28.3%	38.3%	39.2%	39.7%	36.9%	39.7%	35.0%	38.4%	35.8%	39.4%					37.7%	34.7%	38.5%	37.1%
Nokia	23.9%	24.1%	24.1%	25.8%	24.7%	24.0%	27.2%	26.5%	25.4%	23.0%	24.4%	23.7%	23.6%	21.9%	21.9%	25.4%	23.0%					24.5%	25.7%	24.1%	23.2%
Juniper	17.6%	18.4%	18.2%	17.8%	17.9%	19.0%	19.9%	17.5%	16.7%	16.0%	15.7%	17.8%	16.1%	17.8%	19.9%	16.3%	16.9%					18.0%	18.5%	16.6%	17.5%
ZTE	2.3%	2.0%	2.5%	2.3%	2.0%	1.0%	0.6%	1.7%	2.4%	2.0%	1.1%	1.2%	1.0%	0.8%	0.7%	1.6%	1.6%					2.3%	1.3%	1.6%	1.0%
Ciena	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	2.0%	1.7%	1.4%	2.2%					0.0%	0.0%	0.0%	1.5%
Ericsson	0.6%	0.6%	0.6%	0.7%	1.3%	0.9%	0.8%	0.7%	0.8%	0.7%	0.7%	0.6%	0.8%	1.5%	1.5%	1.5%	1.2%					0.6%	0.9%	0.7%	1.3%
Alaxala	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.1%	0.6%	0.6%	0.3%	0.0%	0.5%					0.0%	0.0%	0.1%	0.3%
Infinera	0.4%	0.4%	0.2%	0.4%	0.5%	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%					0.3%	0.3%	0.2%	0.0%
Other	0.9%	0.9%	0.9%	0.9%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%					0.9%	0.9%	0.9%	0.9%

Source: Omdia

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### Exhibit 2: Total Routing ex-China as a Percentage of the Total Global Routing Market

The China routing market continues to decline, with total routing ex-China growing from 78.1% in 1Q22 to 81.3% in 1Q23 of the total global routing market

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	CY19	CY20	CY21	CY22	
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec					
Total ex-China as % of Global	72.0%	69.0%	72.1%	69.4%	71.8%	65.4%	72.6%	71.8%	77.6%	72.4%	76.5%	73.7%	78.1%	75.5%	79.8%	80.3%	81.3%					70.5%	70.3%	74.9%	78.4%

Source: Omdia

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### Exhibit 3: Core and Edge Routing ex-China as a Percentage of the Total Routing Market ex-China

Edge routing continues to remain the largest segment of the total routing market, with a 75% contribution in 1Q23

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	CY19	CY20	CY21	CY22	
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec					
Core as % of Total (ex-China)	26.1%	23.5%	22.8%	22.4%	23.8%	23.3%	23.9%	19.6%	24.2%	23.8%	23.4%	23.1%	25.6%	22.4%	22.5%	21.8%	25.0%					23.6%	22.4%	23.6%	23.0%
Edge as % of Total (ex-China)	73.9%	76.5%	77.2%	77.6%	76.2%	76.7%	76.1%	80.4%	75.8%	76.2%	76.6%	76.9%	74.4%	77.6%	77.5%	78.2%	75.0%					76.4%	77.6%	76.4%	77.0%

Source: Omdia

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## Core Routing Market Trends

### Exhibit 4: Snapshot of the Core Routing Market ex-China

Core routing was 25% of the total routing market ex-China in 1Q23, up 16.8% YoY

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23		CY19	CY20	CY21	CY22	
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec						
Revenue (\$mn)	\$548	\$530	\$505	\$529	\$412	\$490	\$508	\$500	\$536	\$560	\$557	\$628	\$586	\$569	\$585	\$621	\$684						\$2,112	\$1,910	\$2,281	\$2,360
QoQ % Chg	-4.2%	-3.4%	-4.7%	4.9%	-22.2%	19.0%	3.8%	-1.7%	7.3%	4.4%	-0.5%	12.6%	-6.7%	-2.9%	2.9%	6.1%	10.2%									
YoY % Chg	17.2%	-8.5%	-15.5%	-7.5%	-24.9%	-7.5%	0.7%	-5.6%	30.2%	14.3%	9.6%	25.6%	9.3%	1.6%	5.0%	-1.1%	16.8%						-4.7%	-9.6%	19.4%	3.5%
Revenue Share																										
Huawei	11.5%	19.5%	16.4%	18.0%	13.4%	11.4%	14.1%	17.3%	10.3%	12.0%	12.5%	16.9%	9.6%	12.2%	10.7%	15.4%	8.7%						16.3%	14.1%	13.1%	12.0%
Cisco	51.9%	39.6%	43.5%	44.6%	49.9%	48.5%	49.2%	43.4%	57.9%	58.2%	56.7%	55.0%	61.8%	59.6%	63.2%	58.3%	67.5%						45.0%	47.7%	56.8%	60.7%
Nokia	7.9%	8.7%	9.0%	9.7%	8.3%	7.9%	4.1%	5.9%	3.0%	2.8%	3.1%	3.0%	2.7%	2.8%	4.0%	4.8%	3.8%						8.8%	6.4%	3.0%	3.6%
Juniper	26.4%	30.2%	28.7%	24.9%	26.0%	31.0%	31.8%	30.9%	26.3%	25.5%	26.5%	23.7%	24.8%	24.4%	21.0%	19.4%	18.3%						27.5%	30.1%	25.4%	22.3%
ZTE	1.8%	1.5%	1.9%	2.4%	1.8%	0.8%	0.4%	2.1%	2.1%	1.1%	0.8%	1.1%	0.6%	0.6%	0.6%	1.7%	1.3%						1.9%	1.2%	1.2%	0.9%
Other	0.5%	0.4%	0.4%	0.5%	0.4%	0.4%	0.5%	0.5%	0.4%	0.4%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%						0.4%	0.4%	0.4%	0.4%

Source: Omdia

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### Exhibit 5: Core Routing ex-China as a Percentage of the Global Core Routing Market

Investments in core routing in China remain relatively consistent, with core routing ex-China remaining at ~75% of the global core routing market in the last three quarters

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23		CY19	CY20	CY21	CY22
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec					
Core ex-China as % of Global	66.9%	60.0%	65.9%	57.7%	63.5%	57.6%	67.6%	59.0%	71.7%	63.9%	73.0%	64.6%	72.2%	64.2%	76.1%	74.7%	75.1%					62.4%	61.6%	67.9%	71.6%

Source: Omdia

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## Edge Routing Market Trends

### Exhibit 6: Snapshot of the Edge Routing Market ex-China

The edge routing market ex-China grew 20.6% in 1Q23, supported by moderating but continued spending by SPs and cable companies

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	CY19	CY20	CY21	CY22
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec				
Revenue (\$mn)	\$1,556	\$1,725	\$1,711	\$1,836	\$1,321	\$1,609	\$1,618	\$2,054	\$1,677	\$1,795	\$1,827	\$2,085	\$1,706	\$1,965	\$2,021	\$2,230	\$2,056				\$6,828	\$6,601	\$7,384	\$7,922
QoQ % Chg	-20.9%	10.9%	-0.8%	7.3%	-28.1%	21.8%	0.5%	27.0%	-18.4%	7.1%	1.7%	14.1%	-18.2%	15.2%	2.8%	10.4%	-7.8%				1.1%	-3.3%	11.9%	7.3%
YoY % Chg	0.2%	9.9%	3.0%	-6.7%	-15.1%	-6.7%	-5.5%	11.8%	26.9%	11.6%	12.9%	1.5%	1.7%	9.5%	10.6%	7.0%	20.6%							
Revenue Share																								
Huawei	13.2%	14.6%	16.0%	17.7%	17.7%	19.5%	9.3%	25.8%	16.9%	19.8%	18.8%	19.2%	18.5%	21.6%	16.0%	17.5%	16.1%				15.5%	18.6%	18.7%	18.4%
Cisco	37.8%	37.4%	35.4%	31.6%	31.7%	32.6%	36.9%	24.6%	32.1%	33.3%	34.5%	31.5%	32.1%	27.9%	31.2%	29.6%	30.0%				35.4%	31.0%	32.8%	30.1%
Nokia	29.6%	28.8%	28.6%	30.5%	29.8%	28.9%	34.5%	31.5%	32.5%	29.3%	30.9%	29.9%	30.7%	27.5%	27.1%	31.1%	29.4%				29.4%	31.3%	30.6%	29.1%
Juniper	14.5%	14.7%	15.1%	15.7%	15.4%	15.3%	16.1%	14.3%	13.6%	13.1%	12.4%	16.0%	13.1%	15.9%	19.6%	15.5%	16.4%				15.0%	15.2%	13.9%	16.1%
ZTE	2.5%	2.1%	2.7%	2.2%	2.1%	1.1%	0.6%	1.6%	2.5%	2.2%	1.2%	1.2%	1.1%	0.9%	0.7%	1.6%	1.7%				2.4%	1.4%	1.8%	1.1%
Ciena	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	2.6%	2.1%	1.7%	2.9%				0.0%	0.0%	0.0%	2.0%
Ericsson	0.8%	0.8%	0.8%	0.8%	1.7%	1.2%	1.1%	0.9%	1.0%	0.9%	0.9%	0.8%	1.0%	1.9%	1.9%	2.0%	1.6%				0.8%	1.2%	0.9%	1.7%
Alaxala	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.1%	0.8%	0.7%	0.3%	0.0%	0.7%				0.0%	0.0%	0.1%	0.5%
Infinera	0.5%	0.5%	0.3%	0.5%	0.6%	0.4%	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%				0.4%	0.4%	0.2%	0.0%
Other	1.1%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.1%				1.0%	1.0%	1.0%	1.0%

Source: Omdia

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### Exhibit 7: Edge Routing ex-China as a Percentage of the Global Edge Routing Market

The China edge routing market is a more mature market, with new implementations slowing; as a result, edge routing ex-China grew from 80.4% in 1Q22 to 83.6% in 1Q23 of the global edge routing market

	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	CY19	CY20	CY21	CY22
	19-Mar	19-Jun	19-Sep	19-Dec	20-Mar	20-Jun	20-Sep	20-Dec	21-Mar	21-Jun	21-Sep	21-Dec	22-Mar	22-Jun	22-Sep	22-Dec	23-Mar	23-Jun	23-Sep	23-Dec				
Edge ex-China as % of Global	74.0%	72.4%	74.1%	73.6%	74.8%	68.2%	74.3%	75.9%	79.7%	75.5%	77.7%	77.0%	80.4%	79.5%	81.0%	82.0%	83.6%				73.5%	73.3%	77.4%	80.7%

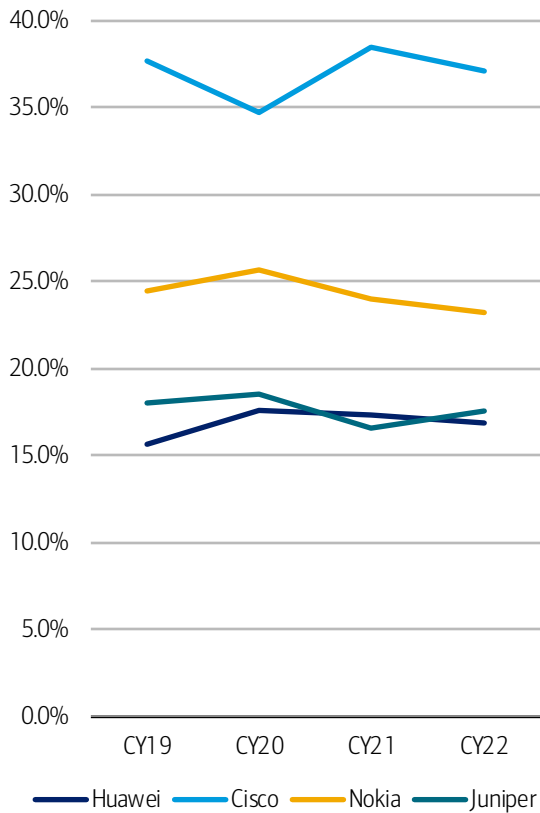
Source: Omdia

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**Exhibit 8: Total Routing Market Overview ex-China**

Cisco lost market share from 38.5% in 2021 to 37.1% in 2022

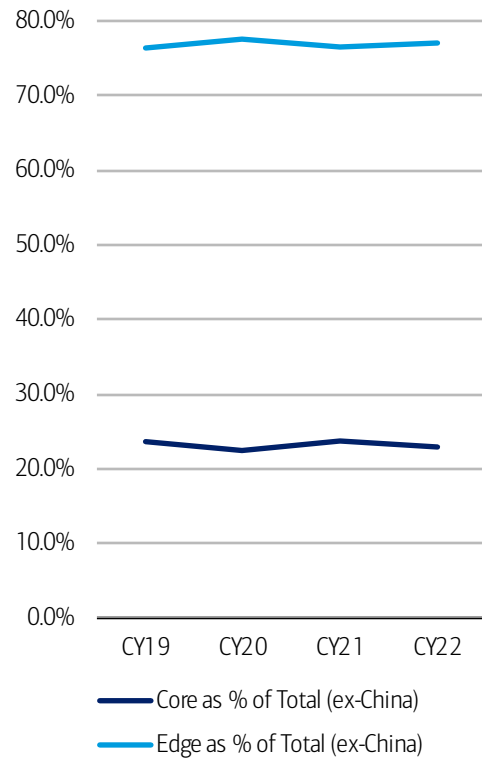


Source: Omdia

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**Exhibit 9: Percentage of Total Routing Market ex-China**

In 2022, edge routing ex-China grew to 77% of total routing ex-China

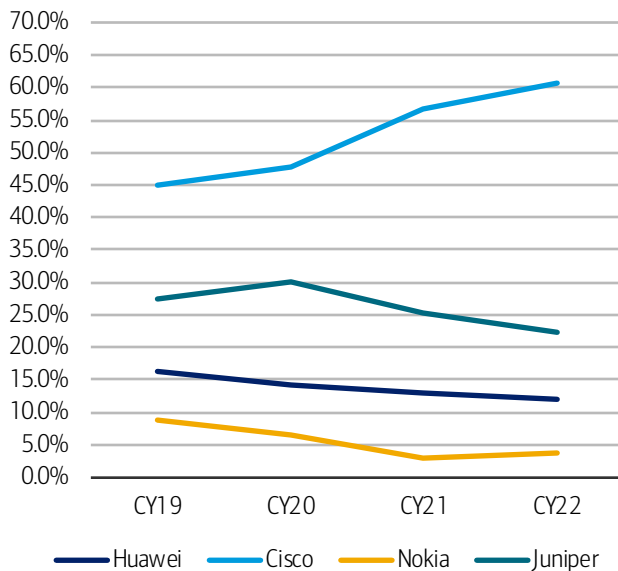


Source: Omdia

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**Exhibit 10: Core Routing Market Overview ex-China**

Juniper lost market share in 2022, while Cisco and Nokia gained share

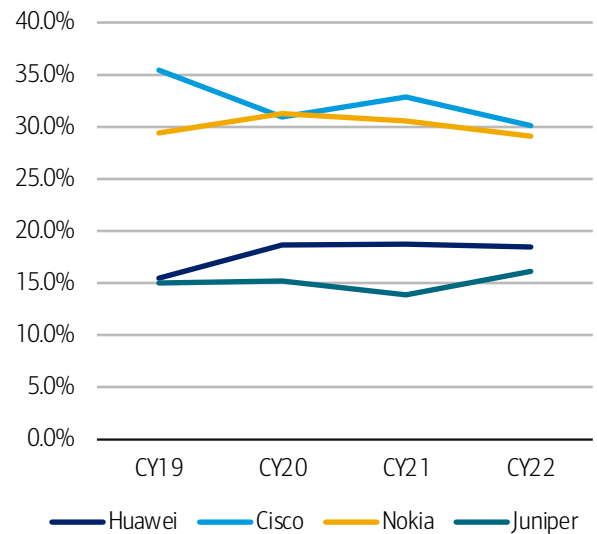


Source: Omdia

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**Exhibit 11: Edge Routing Market Overview ex-China**

Cisco lost the incremental market share it gained from 2021, down to ~30%



Source: Omdia

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