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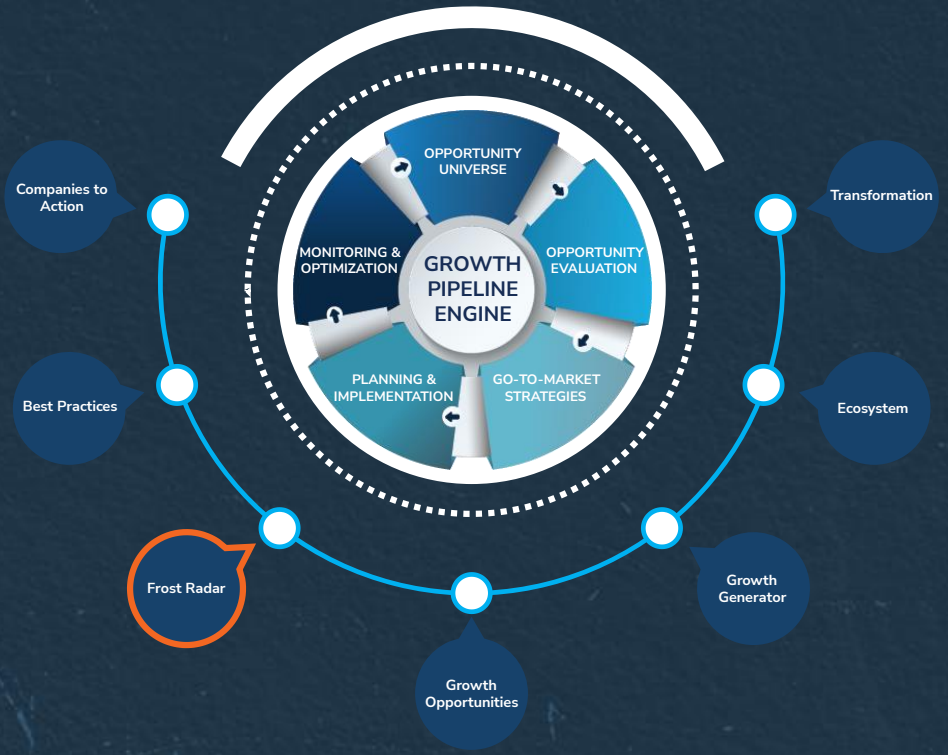
Frost Radar™: 5G Network Infrastructure, 2026

A Benchmarking System to Spark Companies to Action - Innovation That Fuels New Deal Flow and Growth Pipelines



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Strategic Imperative and Growth Environment

Strategic Imperative

- Frost & Sullivan defines 5G network infrastructure to include radio access networks (RAN); transport networks; and core networks, which may include one or more edge networks. The 5G network infrastructure industry includes public networks run by communications service providers (CSPs) and private 5G networks utilized by enterprises in many industry verticals. 5G RAN includes traditional RAN, the newer open and virtual RAN, and artificial intelligence on RAN (AI-RAN).
- 5G core and edge networks are now entirely cloud-based, and the 5G RAN is quickly moving to the cloud. The industry is exploring open interfaces and new architectures for the 5G RAN (which Frost & Sullivan refers to as open and virtual RAN), enabling new suppliers to compete. The O-RAN Alliance drives the direction of open and virtual RAN. The 5G RAN industry includes high-power macro cells and lower-power small cells. The 5G transport network ties together the RAN, the edge, and the core and is also cloud-based.
- 5G introduces many disruptive technologies, from new chips and devices to new network architectures, that will affect all areas of network infrastructure. Evolution in all the technologies that support 5G network infrastructure is constant.
- The promise of 5G for consumers and for enterprises is huge. It is equally impactful on CSPs and their suppliers (in a good way). Growth opportunities abound.
- Functions from the core network and from the RAN are moving to edge networks to reduce latency and enable new use cases.
- While CSPs are investing heavily in 5G, how financially successful the 5G era is for them remains to be seen. This will depend largely on how they monetize the technology and how successful they are with the enterprise segment, which has the potential to grow significantly.

Strategic Imperative (continued)

- Device and infrastructure suppliers are succeeding now with CSP investments, but new business models need to be created for the providers themselves to cash in.
- The consumer market, which has been the bread and butter for CSPs, will remain important, but profit margins will remain low.
- The business and enterprise market will become essential to the success of CSPs. Network slicing and private wireless networks will be areas of focus. Slicing will become more widespread as 5G networks become stand-alone (SA), utilizing a 5G core network. Considering the financial importance that the business and enterprise market holds for CSPs, Frost & Sullivan remains surprised by how long it has taken CSPs to transition to 5G SA. (The number of CSPs moving to 5G SA is finally increasing.)
- While the last few years saw some slowing of the 5G rollout globally, it is continuing to roll out faster than 4G did more than a decade ago. Frost & Sullivan is predicting a return to growth in this market.
- A greater impact to 5G has come from the United States pushing to block Chinese suppliers from competing in parts of the world. This primarily affects leading network infrastructure providers Huawei and ZTE. Some suppliers have tried to take advantage of the situation, with Samsung increasing market share in certain countries and NEC also looking to expand outside of Japan.
- Emerging technologies, such as AI, non-terrestrial networks (NTN), and network APIs, are reshaping the 5G infrastructure market. Beyond the hype, AI-driven network automation is becoming a reality. A new movement—AI-RAN and the AI-RAN Alliance—seeks to automate the RAN and repurpose it for AI workloads. Frost & Sullivan will present a detailed analysis in an upcoming growth opportunity analysis of 5G network infrastructure.

Growth Environment

- Frost & Sullivan believes that CSPs altogether invested just over $60 billion in 2025 on their mobile and wireless network infrastructure, depending on what is included. This investment will increase at a compound annual growth rate of approximately 2.3% over the next five years. The majority of that spend will be on the RAN, with smaller spend on transport and core networks. 2025 saw a continued flattening of CSPs' network infrastructure spend worldwide, specifically related to public cellular networks. Some of that slowdown will be offset by growth in private cellular networks.
- While the 5G era is underway, investments in 2G, 3G, and 4G networks continue. 4G networks remain in the majority and will for the next few years, so investment is still considerable but is already declining. Investment in 5G networks will accelerate and become dominant. Investment in 2G and 3G networks is limited and is declining.
- Frost & Sullivan studies related to this independent analysis:
  - 5G Network Infrastructure, Global, 2026–2030 (KC51-65, to be published May/June 2026)
  - 5G Open and Virtual RAN Market, Global, 2025–2029
  - 5G Transport Network Infrastructure Market, Global, 2025–2029
  - Private 5G Network Market, Global, 2025–2029

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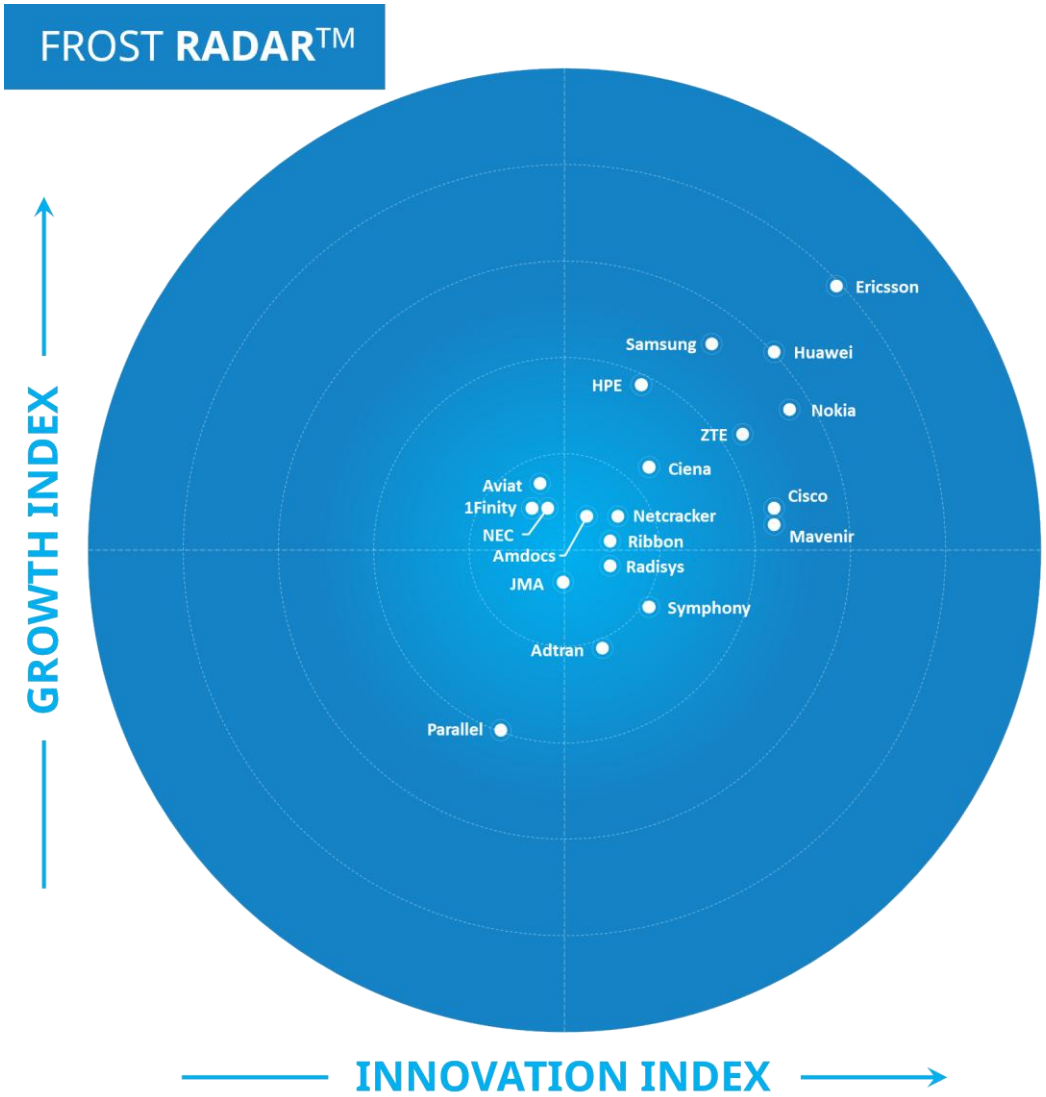
Frost Radar™

5G Network Infrastructure

Frost Radar™: 5G Network Infrastructure



Frost Radar™ Competitive Environment

- From a field of more than 100 industry participants globally, Frost & Sullivan independently plotted the top 20 companies in this Frost Radar™ analysis. These companies either lead the market overall, lead a segment, or are thought leaders in certain segments.
- The 5G network infrastructure industry is emerging and built upon the established 4G network infrastructure space; therefore, it is unsurprising that leaders from 4G place highly here.
- The architecture of 5G brings the possibility of many suppliers working together in each area of network infrastructure: RAN, core/edge networks, and transport networks. In other words, the core network is likely not from a single supplier, but from many suppliers each providing one or more network functions. This opens the arena to new suppliers. Increased competitive intensity raises the level of innovation.
- The Frost Radar™ measures growth rates in addition to absolute revenue and combines them with several other factors to measure companies' performance on the Growth Index. The Frost Radar™ measures innovation for each company by assessing its product portfolio, the scalability of its innovations, the efficacy of its R&D strategy, and several other factors.
- In this analysis, Ericsson is the Growth and Innovation leader, followed by Huawei and Nokia. All were leaders in 4G network infrastructure and continue to lead in 5G network infrastructure. Their offerings include RAN, transport networks, and core/edge networks.
- ZTE also ranked highly. ZTE was in a similar position with 4G network infrastructure, and has had strong initial success in 5G, particularly in China. Huawei and ZTE dominate in China but are limited by political forces in other parts of the world.
- Samsung also has had strong initial success with 5G, moving into new countries and regions and offering itself as an alternative to the leaders, particularly in locations where there is resistance to Chinese suppliers, such as the United States.

Source: Frost & Sullivan

Frost Radar™ Competitive Environment (continued)

- Ericsson, Huawei, Nokia, ZTE, and Samsung hold a combined market share of more than 90%. Most of the rest either focus on a limited part of the infrastructure market or are smaller suppliers (or both).
- Mavenir ranks highly in innovation. This is notable given that it is much smaller than the top five. Mavenir supports core/edge networks and is actively involved in the open and virtual RAN movement. The company, however, has ceased offering the radio for the RAN because it proved to require too much capital.
- Cisco offers core/edge solutions and transport solutions and also ranks highly in innovation.
- HPE increased its 5G network infrastructure solution offerings by acquiring Juniper Networks. The combined companies now offer transport and core/edge network solutions. HPE continues to offer the "infrastructure for the infrastructure," providing hardware that underlies the telco cloud and software network functions for core and edge networks.
- Ciena is strong in growth while only supporting transport networks.
- A number of smaller suppliers focus on open and virtual RAN but are thought leaders in the space, including Rakuten Symphony and Radisys.
- 2024 and 2025 brought changes to this market that impact this and future Frost Radar™ analyses:
  - Fujitsu spun off a new company, 1Finity, that supports this market.
  - HPE acquired Juniper Networks.
  - Mavenir stopped producing radio hardware but is still very much involved in the software supporting open and virtual RAN.

Frost Radar™ Competitive Environment (continued)

- NEC, like Mavenir, is moving out of producing the radios for RAN. NEC remains committed to producing software solutions that support open and virtual RAN.
- Casa Systems, Infinera, and Affirmed Networks will not be covered by this analyses or any future analyses. Casa filed for bankruptcy and no longer exists. Infinera was acquired by Nokia. Affirmed Networks, a Microsoft Company, will be impacted by Microsoft's strategic decision to no longer provide edge/core network functions, but instead focus on Azure, its cloud platform.

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Frost Radar™

Companies to Action

1Finity, a Fujitsu company

INNOVATION

- In July 2025, Fujitsu spun off 1Finity to focus on network infrastructure. Its solutions are built on a foundation of open standards, virtualization, and environment sustainability. 1Finity has positioned its Green 5G solutions as a key market differentiator.
- 1Finity's product portfolio in the context of this Frost Radar™ includes both RAN and transport solutions. The company's RAN solutions include support for open and virtual RAN.
- 1Finity has been successful selling open radio units (RU) in Japan, the United States, and Europe.
- The company invests in R&D to support its innovation pipeline, though not at the level of most of its competitors. Overall, Fujitsu invests less than 3% toward R&D.
- 1Finity/Fujitsu's traditional strengths have been in the Japanese market, but the company has begun challenging competitors in other locations, including the United States and Europe.
- The company is global and has proven its ability to scale its innovations to the global market.

Source: Frost & Sullivan

1Finity, a Fujitsu company (continued)

GROWTH

- 1Finity's strength in network infrastructure started in the transport network. It also was strong in hardware associated with the RAN (the radio and the antenna).
- With the move toward software in the cloud, 1Finity maintains its strength in transport while also entering the nascent open and virtual RAN realm. Virtualization is one of the company's foundations.
- The majority of 1Finity's market share and revenue growth come from Japan. With its expansion outside the Japanese market, its growth pipeline has expanded.

1Finity, a Fujitsu company (continued)

FROST PERSPECTIVE

- The network infrastructure industry had become somewhat insular, dominated by a few network equipment providers. Moving it toward the cloud and to being much more software focused has dramatically changed it and introduced new suppliers, which is always healthy.
- Fujitsu had some presence in 4G network infrastructure, and the door is now open to expand that presence with 5G and the 1Finity spin-off company.
- Competing globally means that 1Finity must focus outside its strength in its home market. The company has been successful in the United States and should build upon that success to enter other regions, such as in Europe or Asia. 1Finity has begun to make inroads into Europe.
- 1Finity is one of the few open RAN suppliers to make inroads into otherwise single-supplier open RAN deals. The company is a supplier of open RUs to AT&T, along with primary supplier Ericsson.

Adtran

INNOVATION

- Adtran's product portfolio is focused on transport networks in the context of this Frost Radar™. The company supports a number of industries, including CSPs and mobile networks.
- Adtran in 2021 announced its acquisition of ADVA and completed it in mid-2022. Adtran now has a more diverse customer base (both geographically and in customer type) and a broader portfolio.
- The company invests strongly in R&D to fund its innovation pipeline. For 2025, Adtran invested almost 19% of revenue toward R&D.
- With the ADVA acquisition, Adtran expanded its international reach considerably. In previous years, as much as 70% of revenue came from the United States. In 2025, revenue from outside the United States stood at nearly 56%, showing that the company can scale its innovations to a global audience.
- In addition to its transport network solutions, the company has timing and synchronization solutions through its subsidiary Oscilloquartz. Timing and synchronization is a key part of 5G network infrastructure requirements.

Adtran (continued)

GROWTH

- In the context of this Frost Radar™, Adtran remains relatively small, even when compared with other transport-only suppliers, though the 2022 acquisition essentially doubled its revenue.
- While growth slowed for the company overall and in its Access and Aggregation reporting segment in 2024. it returned overall in 2025, including in Access and Aggregation.
- The company's geographic reach had been limited, but it now has strength in both the United States and Europe. Adtran had some success in 4G, giving it a customer base on which to build its 5G transport successes.

Adtran (continued)

FROST PERSPECTIVE

- The network infrastructure industry had become somewhat insular: a limited number of suppliers dominated by a few network equipment providers. Moving it toward the cloud and to being much more software focused has changed it and introduced new suppliers, which is always healthy.
- Adtran is in a position to take advantage of the opening. While it did compete in the 4G market (to a limited extent), the door is open to grow the company's involvement with 5G if it chooses to head in this direction. 2024 was a slow year for the company, but revenue levels bounced back in 2025.

Amdocs

INNOVATION

- Amdocs is better known for its business and operational support systems but has long had ties to the core network, particularly around charging and policy.
- The company offers a full 4G/5G core (with partners). This core network can also be used with private cellular networks.
- Amdocs is involved with the Telecom Infra Project (TIP) Open Core Network group that is working to develop an open, cloud-native, and converged core that supports 3GPP 4G and 5G core for licensed, unlicensed (e.g., Wi-Fi), and shared spectrum networks.
- The company supports open and virtual RAN. In particular, Amdocs is using its orchestration and system integration expertise in its open RAN solution offering, in which the company provides the service management and orchestration layer with the RAN intelligent controller (RIC) and validates and integrates other supplier components.
- For its entire portfolio, including areas outside of 5G network infrastructure, the company reports more than 350 customers in approximately 85 countries. This is a strong indication that Amdocs can scale its innovations on a global level.
- The company invests in R&D to support its innovation pipeline, but at a relatively low level in comparison to other infrastructure suppliers. For 2025, Amdocs invested 7.5% of revenue toward R&D.

Amdocs (continued)

GROWTH

- While not as large as the former network equipment providers, Amdocs is a significant global company with more than $4.5 billion in revenue and approximately 29,000 employees. Combined with its large customer base, this provides the company with a strong growth pipeline for its business and operational support system and network infrastructure solutions.
- Amdocs' work with TIP on the Open Core Network and membership with the O-RAN Alliance, which is driving the open and virtual RAN movement, will enable it to increase its market share in 5G network infrastructure—particularly in the RAN areas.
- Open and virtual RAN is a nascent part of the overall RAN industry, but one that Frost & Sullivan is optimistic about. This market will grow substantially, and Amdocs is well positioned to take advantage of that growth.

Amdocs (continued)

FROST PERSPECTIVE

- While it is early in the 5G era, growth opportunities in the 5G network infrastructure space will last for many years.
- Amdocs is well-known to CSPs and has an opportunity to extend those relationships with network solutions. Participating in the nascent open and virtual RAN movement is essential and is an excellent way for Amdocs to show its abilities. While significant sales may be years away, eventually open and virtual RAN will become the norm.
- The market for private cellular networks is growing rapidly, and that growth also should continue for many years.

Aviat Networks

INNOVATION

- The product portfolio from Aviat is focused on transport networks in the context of this Frost Radar™.
- Transport networks include wired (primarily fiber) and wireless options. While most of the transport-only suppliers on this Frost Radar™ provide wired transport, Aviat focuses on wireless transport in support of CSPs and enterprise.
- Compared with other suppliers that offer transport solutions, the company's investment in R&D is not as strong. For 2025, Aviat invested 8.2% of revenue toward R&D.
- Aviat has increased its sales outside of North America: for fiscal 2025, almost 50% of its revenue was international. This provides proof that Aviat can globally scale its innovations.
- As the needs for higher transmit speeds increase, wireless transport has different challenges than wired transport. More capacity requires higher frequencies, but this limits the link distances and can be impacted by rain and wind. Aviat's Multi-Band solution addresses these deficiencies by combining E-band (80 GHz) with traditional microwave (e.g., 18 GHz) in a single unit operating over a single antenna. This provides the increases in capacity of the higher frequencies and provides coverage if weather requires.

Aviat Networks (continued)

GROWTH

- Aviat is focused on wireless transport, which means on a submarket of a submarket. This, combined with the company's relatively small size, limits its potential market share.
- Still, every industry needs experts in niches; this niche appears to be growing, considering that Aviat had five consecutive years of double-digit revenue growth. 2025's growth did not hit double digits but was still strong at approximately 6%.
- Transport networks are essential to 5G—and that includes wireless transport. Aviat has a customer base from 4G, giving it a growth pipeline as the industry shifts to supplying 5G network infrastructure.
- At the end of 2023, Aviat acquired NEC's wireless transport business, which the company claims will increase the scale and reach of its global business. 2025 results appear to confirm this, with growth particularly strong in Asia-Pacific and Latin America.

Aviat Networks (continued)

FROST PERSPECTIVE

- In the past, the entire network infrastructure market—including the transport network segment—was dominated by a limited number of network equipment providers. These suppliers still lead, but the focus is now on software running in the cloud.
- The number of suppliers has increased, which is good for the market. Aviat's focus on wireless transport means that its primary competitors are those very large companies formerly known as network equipment providers.
- Frost & Sullivan recommends a continued focus on this specialty and on continued expansion outside of North America.

Ciena

INNOVATION

- Ciena’s product portfolio is focused on wired transport networks in the context of this Frost Radar™. The company has positioned itself as a provider of high-capacity, automated transport solutions for the 5G era.
- The company invests strongly in R&D to fund its innovation pipeline, reaching almost 18% in fiscal 2025.
- Ciena claims 1,600 customers, which include CSPs (and 85% of the world's largest CSPs). This shows that it has the ability to scale its innovations. The company also reports holding more than 2,200 patents.
- Because network infrastructure has moved toward the cloud and to software, Ciena’s product line has become programmable, automated, and intelligent.
- Ciena’s WaveLogic 6 family continues to push optical performance and spectral efficiency while reducing power needs.

Ciena (continued)

GROWTH

- While Ciena is only focused on the transport network, the company is the largest in this segment. It generates most of its revenue from CSPs. Most of the the company's revenue comes from the Americas.
- Ciena has a strong customer base from 4G, giving it a solid growth pipeline as the industry shifts to supplying 5G network infrastructure.
- Growth slowed slightly in 2024 but returned in fiscal 2025 with an almost 19% jump in revenue. This was primarily driven by the Networking Platforms segment, where optical networking revenue reached almost $3.25 billion.

Ciena (continued)

FROST PERSPECTIVE

- As network infrastructure moves from being dominated by a few suppliers to more open and software- and cloud-based, new suppliers can bring new innovations and new life to the industry.
- Ciena is positioned to take advantage of the opening of the 5G network infrastructure market, having competed successfully with the market leaders during 4G.
- Ciena measures strongly in both innovation and growth in the context of the Frost Radar™.
- A next-step recommendation is to focus on expanding beyond its strength in the Americas. The company generates less than 25% of its revenue in the Europe, Middle East, and Africa (EMEA) and Asia-Pacific regions combined; the goal should be to increase that percentage.

Cisco

INNOVATION

- Cisco's product portfolio includes transport network and core/edge network solutions. While the company does not provide RAN solutions, it has been active in the open and virtual RAN movement and has partnered with a number of open and virtual RAN suppliers.
- The company has a significant enterprise customer base but also supports CSP networks.
- Innovations for enterprise benefit CSP customers and vice versa. This is particularly true in the small but fast-growing submarket of private cellular networks.
- The company invests solidly in R&D for the enterprise and CSP spaces. For 2025, Cisco invested more than 16% of revenue in R&D.
- Cisco has proven its ability to scale its innovations globally with 3G, 4G, and now 5G.

Cisco (continued)

GROWTH

- As a leader in 4G infrastructure, Cisco enters the 5G arena with an existing CSP customer base. Perhaps even more importantly, it enters the private 4G/5G network market with a large base of enterprise customers that know and trust the company for their networking needs. Combined, these present the company with a strong growth pipeline.
- The early stages of the 5G era have focused on the RAN, but as 5G matures and moves toward 5G SA, the core networks and the transport networks become key; Cisco should benefit.

Cisco (continued)

FROST PERSPECTIVE

- While Cisco's growth in the 5G network infrastructure market over time will be relatively flat, two submarkets—open and virtual RAN and private cellular networks—should exhibit much stronger growth.
- For open and virtual RAN, Cisco's approach to the nascent submarket with partnerships will enable small RAN suppliers to access larger customers as well as benefit Cisco's bottom line.
- In the private cellular network submarket, Cisco has a large advantage over other suppliers: it already has the customer base. It already offers Wi-Fi solutions and now offers a private cellular networking option.
- 5G was designed with the enterprise in mind. That presents Cisco with an advantage since that customer group has long been its focus as well.

Ericsson

INNOVATION

- Ericsson has proven its ability to scale its innovations globally with 2G, 3G, 4G, and now 5G. The company reports that it has customers in more than 175 countries.
- The company invests significant amounts in R&D; this is essential in an industry in which technology is always evolving. For 2025, Ericsson invested almost 21% of revenue toward R&D.
- Ericsson's product portfolio includes all areas of 5G network infrastructure as well as previous generations of network infrastructure. This includes traditional RAN, open and virtual RAN, and private networks. Ericsson is also promoting network APIs as a road to new innovation around mobile networks and utilizing AI to automate its network offerings. The company is a founding member of the AI-RAN Alliance.
- The company began to offer open and virtual RAN solutions in 2024. Frost & Sullivan believes that this has resulted in significant growth in the open and virtual RAN market and that Ericsson is a leader in this market.
- Ericsson’s strategy continues to center on CSPs’ evolving needs in all areas of the world. However, with its 2020 acquisition of Cradlepoint, Ericsson also is expanding its role with enterprise customers.

Ericsson (continued)

GROWTH

- As a leader in 4G infrastructure, Ericsson enters the 5G arena with a large customer base. The company has done an excellent job keeping its current customers and adding new customers (including significant replacement wins over competitors).
- 2023 and 2024 were down years in network infrastructure, and they impacted Ericsson. However, Ericsson has spent the last few years adjusting its overall strategy to focus on profitability, which enabled it to weather the COVID-19 pandemic and the slowing of the infrastructure market. 2025 appeared to be a transition year for Ericsson. While its Networks segment was slightly down, the company's profits were up significantly.

Ericsson (continued)

FROST PERSPECTIVE

- While the company's turnaround strategy from a few years ago has been successful, the battle to grow and maintain profitability continues and needs a sustained focus.
- The infrastructure market tends to grow slowly on average, and that means some years will feature growth and others will not. The last three years featured slowing growth, highlighting how important profitability and financial stability are to all businesses.
- Frost & Sullivan believes that eventually all RAN will be open and virtual. Ericsson's step into offering open RAN solutions in 2024 will help make this a reality, especially since its first few customers are large and influential CSPs.
- Energy efficiency has been a buzzword for a few years, and Ericsson continues to tout solutions that are smaller and lighter and that save energy, satisfying its customers' needs. This will continue with its traditional RAN solutions and accelerate with its new open RAN offerings. The company reports that it has reduced RAN energy consumption by 40% from 2021 levels.
- The market for private 4G and 5G networks has not grown as quickly as expected, but Frost & Sullivan believes there are still great opportunities to be had. Ericsson must work with its CSP customers to target these new opportunities in the enterprise world.

Hewlett Packard Enterprise

INNOVATION

- HPE acquired Juniper Networks in 2025, which expanded its network infrastructure portfolio considerably. Prior to acquisition, HPE's product portfolio included edge and core network solutions, along with the "infrastructure for the infrastructure": the hardware on which the telco cloud operates and the software that enables the various cloud-based networks to function and be managed. With Juniper on board, HPE now has transport network assets.
- In 2023, HPE acquired Athonet, which provides an edge/core solution that is well suited for private cellular networks. The Juniper acquisition likely improves HPE's private 5G solutions.
- The company invests in R&D to support its innovation pipeline, though not at the level of some of its competitors. HPE invested 7.3% of revenue in support of R&D in 2025.
- HPE's focus in the 5G infrastructure space has been in reducing risk for its customers. This has been done via a number of innovative paths, including Telco Blueprints, offering solutions on a consumption or as-a-service model, and pre-integration of core/edge network function software with multiple suppliers.

Hewlett Packard Enterprise (continued)

GROWTH

- HPE supports the core and edge networks in particular but also provides other essentials that make the 5G network infrastructure work. Now with Juniper on board, HPE's potential market share expands beyond what was available previously.
- The Athonet acquisition helps with growth related to private cellular networks, and the Juniper acquisition will expand its growth profile in the coming years.
- The company has been involved with telecom for decades and has a strong customer base to fuel its growth pipeline. It has proven that it is able to support a global customer base.
- Frost & Sullivan believes that HPE's new corporate strategy, HPE Greenlake, in which everything is available as a service, will drive growth in the 5G infrastructure market, particularly among smaller service providers. The company also has a large number of partnerships that will help with growth.

Hewlett Packard Enterprise (continued)

FROST PERSPECTIVE

- HPE has long been involved with telecom but also has a strong business in the enterprise space that, in many ways, leads the telecom industry in innovation. HPE must leverage its strength with enterprise to advance its standing in the 5G network infrastructure arena. With Juniper, HPE greatly increases its portfolio and stature and becomes more of a competitive threat in both enterprise networking and 5G network infrastructure.
- Frost & Sullivan initially believed this could move HPE closer to the RAN, as Juniper had a well-respected RIC. However, HPE sold Juniper's RIC and Service Management and Orchestration (SMO) assets to Nokia. HPE is focusing on RAN-neutral transport networks. HPE has been a strong proponent of the Open RAN movement and will continue this support.
- The network infrastructure industry is more open with 5G and includes many more suppliers. This increases innovation but also increases risk. HPE's multiple approaches to reduce risk for its customers in this space is a winning proposition. HPE must emphasize this to its current and potential customers.

Huawei

INNOVATION

- With success in previous generations of wireless infrastructure, Huawei has proven its ability to scale its innovations globally. The company reports that it operates in more than 170 countries.
- The company's product portfolio includes all areas of 5G network infrastructure as well as previous generations of network infrastructure. This includes traditional RAN and private networks, as well as AI to automate its networks. The company notably has not been involved in the open and virtual RAN movement and has been publicly opposed to it.
- The company invests significant amounts in R&D; this is essential in a market in which technology is always evolving. For 2025, Huawei invested 21.8% of revenue toward R&D.

Huawei (continued)

GROWTH

- Huawei is significantly larger than its main competitors: it offers consumer and enterprise products in addition to its CSP network infrastructure business. This broader focus can provide the company with advantages in dealing with down years in the network infrastructure market, similar to the last few years.
- As a leader in 4G infrastructure, Huawei enters the 5G infrastructure space with a large customer base.
- Rapid expansion of 5G in China, where Huawei dominates, has kept the company as a revenue leader in 5G network infrastructure.
- The company's growth pipeline, while still significant, is being hurt by political battles over Chinese suppliers and their ties to the Chinese government. The United States continues to push other countries to ban Huawei (and ZTE) in their mobile networks; these efforts have begun to hurt Huawei in some locations, and the company's financial results have begun to be affected.
- The company's focus beyond just network infrastructure has helped it weather the political storm and remain financially stable.

Huawei (continued)

FROST PERSPECTIVE

- Participation in the open and virtual RAN movement moving forward is essential. Frost & Sullivan believes this market will grow significantly in the long term. Huawei is not involved in this area; it is the only leading infrastructure supplier to not be involved with the O-RAN Alliance. (Interestingly, some of Huawei's largest customers are involved with the O-RAN Alliance.)
- Huawei has been actively working with enterprises on private cellular networks. While this submarket is still relatively small, Frost & Sullivan believes it will grow significantly over the next decade.
- The political pressure from the United States did not lessen under the Biden administration, and the second Trump administration has not offered any relief. Frost & Sullivan believes politics should not be such a factor in the 5G network infrastructure market, yet it continues to be.

JMA Wireless

INNOVATION

- JMA Wireless is a small supplier whose product portfolio in the context of this Frost Radar™ focuses on open and virtual RAN. JMA supports a number of industries outside of the CSP market.
- JMA also provides a core network specifically for private 4G and 5G networks.
- The company has a global workforce, proving it has a global reach. However, JMA maintains its core intellectual property in the United States.
- While the company's private status makes its R&D investments unknown, Frost & Sullivan believes it is adequately funding its innovation pipeline.
- The company is involved in standard work important to 5G, including the 3GPP and the O-RAN Alliance. This keeps it at the forefront of innovation, specifically with open and virtual RAN.

JMA Wireless (continued)

GROWTH

- JMA Wireless is a relatively small player in the nascent open and virtual RAN arena and focuses on other industries beyond CSP mobile networks. This means its market share is small at this point. The potential for growth is large, however, at least in the telecom space.
- The company also is involved in private wireless networks. While this is an adjacent market to 5G network infrastructure, it remains promising over the next decade.
- The company prides itself on being a US-based supplier, which opens the door for growth in support of US government needs around private wireless networks.

JMA Wireless (continued)

FROST PERSPECTIVE

- In the past, a few large network equipment providers dominated the network infrastructure market. Moving it toward the cloud and to being much more software focused has changed it and introduced new suppliers and new innovations, which is always healthy. JMA Wireless is one of those new suppliers.
- To take advantage of the potential for huge growth in open and virtual networks in the telecom industry, JMA must focus more of its attention here than on other industries it supports. CSPs already shy away from smaller suppliers; being a small supplier not completely focused on their needs will only add more hesitancy.

Mavenir

INNOVATION

- Mavenir is a medium-sized US company whose product portfolio for 5G network infrastructure includes solutions for RAN and core/edge networks. In the RAN area, Mavenir focuses on open and virtual RAN solutions. After a foray into open RAN radio hardware, which proved to be too capital intensive for a smaller company, it has returned to its roots as a software-only supplier.
- Mavenir claims approximately 300 customers in more than 120 countries for all its solutions, which include those outside of network infrastructure. This provides proof that the company can scale its innovations globally.
- The company is private, so exact R&D investments are not known. However, the company claims almost 60% of its employees are in R&D, which would indicate a significant R&D investment.
- Frost & Sullivan has always ranked Mavenir highly in innovation. The company was an early believer in the value of cloud-native software and claims all its solutions are cloud-native. Mavenir is now progressing toward AI-native solutions.

Mavenir (continued)

GROWTH

- Mavenir is still relatively small, but it has proven the ability to support customers globally. This will become essential as its market share increases.
- Mavenir reports that the revenue from its open and virtual RAN solutions and its edge/core network solutions continues to grow.
- Mavenir is a private company but continues to obtain strong investments from a number of financiers. This is important to enable Mavenir to compete against the large leaders in 5G network infrastructure.

Mavenir (continued)

FROST PERSPECTIVE

- In the past, the number of suppliers in network infrastructure was limited. The move toward software solutions in a cloud environment has opened the door to Mavenir in the core/edge network market and now in the RAN market.
- Open and virtual RAN is a nascent part of the overall RAN market, but one that Frost & Sullivan thinks will grow substantially. Mavenir is well positioned to take advantage of that growth. While the company has great potential, it must remain financially viable while it waits for the market to expand. The move to no longer produce radios greatly improved its financial standing.
- The company is also active in private cellular networks—another submarket in which Frost & Sullivan projects substantial growth over the next decade.

NEC

INNOVATION

- NEC's product portfolio includes all areas of 5G network infrastructure. For 5G RAN, the company offers open and virtual RAN solutions. In previous years, NEC's portfolio included open RAN radios; it recently withdrew from that market, as it could not compete with the leaders (NEC was the sixth-largest supplier of RAN globally).
- While telecom has traditionally been a small part of NEC's success, the company has more than a century of technological experience.
- NEC is large enough to scale its innovations globally but relies on the home market of Japan for approximately 79% of its revenue. While NEC is a technology company, it invests a small amount in R&D versus its network infrastructure competitors.

NEC (continued)

GROWTH

- Prior to 5G, NEC had a limited customer base for 4G, primarily in Japan. With 5G and open and virtual RAN, NEC is looking to grow its market share considerably and expand outside of Japan.
- The company is also looking to provide system integration capabilities to bring together the potentially numerous suppliers that make up an open and virtual RAN solution. (The trend towards single-vendor open RAN solutions has minimized this opportunity.)
- NEC has been actively working with enterprises on private cellular networks. While this submarket is still relatively small, Frost & Sullivan believes it will grow significantly over the next decade.
- The company provides parts of the 5G core network and the open and virtual RAN for Rakuten in Japan. With Rakuten Symphony moving to sell its platform to global CSPs, NEC is looking to capitalize on this expanded exposure to capture a much larger share of the 5G infrastructure market by 2030.
- While NEC views 5G as a long-term growth opportunity, the company pulled back some from planned international expansion until the market becomes more favorable. NEC also sold its wireless transport business to Aviat Networks.

NEC (continued)

FROST PERSPECTIVE

- Frost & Sullivan has been optimistic about the potential for open and virtual RAN in the next decade. One potential issue is that many suppliers trying to enter this market are smaller companies that CSPs may or may not accept. NEC is large enough and established enough to overcome some of these potential objections and can provide system integration capabilities. NEC is also large enough to weather downturns in the market.
- The market for private 4G and 5G networks is growing rapidly, and that growth should continue for many years. NEC already has a few success stories with enterprises in Japan and should look to expand beyond its home market.

Netcracker

INNOVATION

- Netcracker is better known for its business and operation support systems, but has long had ties to the core network, particularly around charging and policy.
- The company supports open and virtual RAN; in particular, Netcracker provides the service management and orchestration layer with the RIC, which takes advantage of the company's strength in orchestration.
- Since 2008, Netcracker has been a subsidiary of NEC. The 2011 earthquake and tsunami in Japan forced a revamp of Japan's communications networks; because of this, Netcracker became a cloud expert much earlier than most suppliers in the telecom space. This expertise serves the company well because the 5G era is marked by a significant move to the cloud for telcos, including in 5G network infrastructure.
- For its entire portfolio, including areas outside of 5G network infrastructure, the company reports more than 250 customers in more than 70 locations worldwide. This is a strong indication that Netcracker can scale its innovations on a global level.
- The company invests in R&D to support its innovation pipeline, but the exact amount is unknown: as a subsidiary of NEC, its financials are not separated out.

Netcracker (continued)

GROWTH

- Netcracker is not as large as the leaders in 5G network infrastructure but is larger than many of the suppliers covered in this Frost Radar™ analysis.
- Combined with its large, global customer base, the company has a strong growth pipeline for its business and operational support systems and network infrastructure solutions.
- In the past, the number of network infrastructure suppliers was limited. The move toward software solutions in a cloud environment has opened the door to Netcracker in the core/edge network market and now in the RAN market.

Netcracker (continued)

FROST PERSPECTIVE

- Netcracker is well known to CSPs globally for its business and operational support system solutions and has a great opportunity to expand into network infrastructure.
- While it is early in the 5G era, the growth opportunities in the 5G network infrastructure space will last for many years. The company should take advantage of its cloud expertise as well as its business and operational support system prowess and push to expand into the 5G network.
- While significant sales may be years away in the nascent open and virtual RAN market, open and virtual RAN eventually will be the norm. Now is the perfect time for Netcracker to prove its worth in RAN.

Nokia

INNOVATION

- Nokia has proven its ability to scale its innovations globally with 5G and previous generations of wireless. The company reports that it operates in about 150 countries.
- Nokia's product portfolio includes all areas of 5G and previous generations of network infrastructure. This includes traditional RAN, open and virtual RAN, and private networks. The company is also utilizing AI to automate its network offerings. The company is a founding member of the AI-RAN Alliance.
- Nokia has been involved in the O-RAN Alliance for years and has some O-RAN-compliant solutions in operation. In 2024, the company expanded those offerings in addition to its traditional RAN solutions.
- Nokia has expanded its focus beyond CSPs to include large enterprises, to which it offers private 4G and 5G networks either with CSP partners or directly.
- The company continues to invest significant amounts in R&D to feed its innovation pipeline. In 2025, it invested 24.4% of revenue toward R&D.

Nokia (continued)

GROWTH

- As a leader in the 4G infrastructure market, Nokia enters the 5G market with a large customer base. Nokia, in general, has been successful in keeping its customer base and adding new customers. However, it did lose a major customer to a competitor at the end of 2023, which led to revenue losses over the previous few years.
- Nokia maintains a significant pipeline of customers that have yet to move to 5G but will in the coming years.
- Nokia has been successful with private 5G networks and has a long list of enterprises that have utilized Nokia's private 5G solutions. However, the company is changing how it approaches this market as it reorganizes itself to be more financially resilient.
- Nokia continues to battle with Ericsson and Huawei for the lead in the network infrastructure market but has lost some momentum in the last three years.

Nokia (continued)

FROST PERSPECTIVE

- Frost & Sullivan has been optimistic about the potential for open and virtual RAN in the next decade. With three of the five top infrastructure suppliers (Nokia, Ericsson, and Samsung) delivering or soon to deliver open and virtual RAN solutions, this nascent market should begin to demonstrate the growth that Frost & Sullivan has been projecting.
- Nokia also has been a strong proponent of private 4G and 5G networks and likely leads in this domain. Frost & Sullivan continues to project strong growth for private networks, though they have not grown as quickly as expected. It remains to be seen how the company approaches private networks with its recent reorganization changing focus to increase financial stability.
- Frost & Sullivan believes the Infinera acquisition in early 2025 will be positive for Nokia over time. Nokia strengthened both its optical networking capabilities (key for 5G transport networks) and its data center market presence. Frost & Sullivan thought of Infinera as a very innovative supplier, and that innovation is now serving Nokia.

Parallel Wireless

INNOVATION

- Parallel Wireless is a small US supplier that focuses on a niche market: open and virtual RAN.
- In 2022, due in part to the slower-than-expected pace of adoption of open and virtual RAN, the company laid off as much as 80% of its staff. The initial goal was to make the company self-sustaining and able to survive until investment in open and virtual RAN increased. Given that it is 2026 and the company is still around, it appears the initial goal has been met.
- While the company's private status makes its R&D investments unknown, the announcement of such a significant reduction in workforce forces Frost & Sullivan to question Parallel's funding of its innovation pipeline.
- One of the company's most important innovations was to focus on open and virtual RAN for "all G": 2G, 3G, 4G, and 5G. This has opened the market for open and virtual RAN to emerging areas where 2G and 3G still are essential.
- Parallel Wireless has refocused its R&D on three areas: GreenRAN, which focuses on energy efficiency; Trusted RIC, which ties to the open and virtual RAN's RAN intelligent controller; and UNITY.AI, which focuses on 6G and intelligence in the RAN.

Parallel Wireless (continued)

GROWTH

- Parallel is a small but prominent player in the nascent open and virtual RAN domain. This means that while its market share is small, the potential for growth is huge if it can recover financially.
- Parallel remains active in showing the potential for open and virtual RAN in the real world with CSPs. However, the company faces questions from potential customers about its long-term viability.
- The company appears to be generating enough business to sustain itself. It attends industry conferences and talks about new initiatives (GreenRAN, Trusted RIC, and UNITY.AI) However, evidence of significant growth is still lacking.

Parallel Wireless (continued)

FROST PERSPECTIVE

- The number of suppliers in network infrastructure had been limited. With changes in architecture and the move toward software-focused solutions in a cloud environment, the number of suppliers and competition have increased. This is a healthy sign for 5G network infrastructure.
- Parallel Wireless is one of the newer players in this market and was one of the most promising prior to its stumbles in 2022. Its survival strategy has appeared to work.
- Frost & Sullivan is optimistic about growth prospects in the open and virtual RAN niche, and Parallel could be positioned to take advantage of that.
- The next steps for Parallel are to reassure existing and potential customers that it remains financially viable. Significant growth will not return until customers believe in the company's future.

Radisys

INNOVATION

- Radisys was a public company focused more on hardware but was acquired by a CSP customer (Reliance Jio) in 2018 and is now private and more focused on software solutions.
- The company has been a leader in work with the O-RAN Alliance toward standards supporting open and virtual RAN solutions. Much of the company's work has been behind the scenes, innovating in this nascent but exciting part of 5G network infrastructure.
- Radisys moved from behind the scenes onto the stage in 2023 and now offers its own open and virtual RAN solution.
- Its most visible client is its owner, but Radisys sells software assets in an original equipment manufacturer (OEM) relationship with other open and virtual RAN suppliers, including a number on this Frost Radar™.
- While the company's private status makes its R&D investments unknown, the company's visibility in the open and virtual RAN space makes Frost & Sullivan believe it is adequately funding its innovation pipeline.

Radisys (continued)

GROWTH

- While the main focus for Radisys in network infrastructure is with open and virtual RAN, the company also supports private networks with a 5G core network offering.
- Radisys, as a small company, has done extensive partnering to get its solutions to the marketplace. This increases its market potential. While it sells its RAN stack in OEM relationships, most of these deals remain confidential.
- The company is working with the government of Ghana and a few other technology companies (including Nokia) on support of Next Gen Infraco (NGIC). NGIC holds an exclusive 10-year license on 5G spectrum and operates on a network-as-a-service model. Local CSPs lease capacity from this shared infrastructure so each CSP does not have to build out its own infrastructure. NGIC uses Radisys's open RAN software stack. Radisys believes this model could be replicated in other African countries.
- The OEM relationship with other open and virtual RAN suppliers increases the company's market share and revenue but limits its visibility in important potential customer networks.

Radisys (continued)

FROST PERSPECTIVE

- Radisys was included on this Frost Radar™ because of its thought leadership in the open and virtual RAN space. Frost & Sullivan believes Radisys could increase its market share by leveraging this and moving beyond its owner/customer to offer its solutions to other CSPs in emerging markets. Its collaboration in Ghana appears to a great first step in this direction.
- The revenue generated by the open and virtual RAN submarket is limited at this point, but Frost & Sullivan believes this area will grow significantly in the next decade.
- Radisys is in the right market at the right time but needs to expand its customer base.
- The market for private 5G networks is growing rapidly, and that growth should continue for many years. Radisys is wise to focus on this niche, along with open and virtual RAN (which can also be part of private networks).

Rakuten Symphony

INNOVATION

- Altiostar was a US supplier of open and virtual RAN; Rakuten, a previous investor in the company and one of its customers, acquired it in 2021 for more than $1 billion.
- Rakuten created the fourth mobile network operator in Japan (Rakuten Mobile) utilizing open and virtual RAN. Rakuten Symphony brings together the “secret sauce” employed by Rakuten Mobile and makes it available to other CSPs globally.
- The Altiostar brand, while still recognized in the industry, is being replaced by Rakuten Symphony, which includes everything needed for open and virtual RAN at scale. This includes telecom cloud, enterprise cloud, open RAN, and even operational support systems.
- One of the innovation criteria in this Frost Radar™ analysis revolves around customer alignment and customer needs. Rakuten Symphony (including Altiostar) aligns with Rakuten Mobile’s needs, and the hope is that it also aligns with other CSPs’ needs as they start on the open and virtual RAN journey.
- Frost & Sullivan ranks Rakuten Symphony highly for innovation—particularly for a smaller company—and believes its innovation pipeline is now well funded, particularly as its parent company, Rakuten Mobile, has reached profitability.

Rakuten Symphony (continued)

GROWTH

- Rakuten Symphony is a small but prominent player in the nascent open and virtual RAN space. This means its market share is small at this point, but the potential for growth is huge.
- The transition from Altiostar to Rakuten Symphony only increases the company's growth potential. The open and virtual RAN market is new and still evolving; many CSPs have been hesitant to head down this new path. Rakuten Mobile has demonstrated the potential for this niche market in the real world, and packaging its solution as Rakuten Symphony enables other CSPs to follow its lead with less risk.
- One of the concerns raised about open and virtual RAN is the potential increase in integration costs with multiple suppliers working together. The Rakuten Symphony approach provides preintegration along with proven-at-scale solutions. This helps overcome any concerns and should increase the demand for open and virtual RAN solutions.

Rakuten Symphony (continued)

FROST PERSPECTIVE

- In the past, the number of suppliers in network infrastructure was limited. With changes in architecture and the move toward software-focused solutions in a cloud environment, the number of suppliers and competition have increased. This is a healthy sign for the 5G network infrastructure industry.
- Rakuten Symphony (with Altiostar) is one of the newer players in this domain. Open and virtual RAN remains a small niche, but Frost & Sullivan expects substantial growth over the next decade. Rakuten Symphony is well positioned to take advantage of that growth.

Ribbon Communications

INNOVATION

- Ribbon's product portfolio is focused on transport networks in the context of this Frost Radar™ analysis.
- The company invests heavily in R&D to fund its innovation pipeline. Since at least 2018, the percentage of R&D to total revenue for Ribbon has exceeded 20% every year; in 2025, the percentage exceeded 21%.
- In 2020, Ribbon merged with ECI Telecom Group, which increased the combined companies' potential for innovation and their ability to scale those innovations.
- In 2019, the majority of Ribbon's revenue was generated in the United States. That shifted after the merger: in 2025, 52% of its revenue came from outside the United States; now the company is less dependent on any single region and has a global reach for its innovations.
- While not a supplier of RAN, the company is involved with the O-RAN Alliance and its work on open and virtual RAN. Ribbon participates in the Open X-haul Transport work group.

Ribbon Communications (continued)

GROWTH

- With the merger, Ribbon increased its employee count and revenue by a considerable amount. The merger also increased its share in the 5G transport market and its growth pipeline.
- While growth is limited in the 5G network infrastructure market because of its focus on only the transport network space, the company appears to be making great strides in the submarket.
- The merger increased its technical staff and its sales and marketing capabilities (particularly outside the United States). This provides a key strength moving forward to increase growth in all regions.

Ribbon Communications (continued)

FROST PERSPECTIVE

- The 5G network infrastructure industry is much different than past generations. Software in the cloud is now the focus. The number of suppliers has increased, as have the number of innovations. This is all good news.
- Ribbon is well positioned to take advantage of the opening of the 5G network infrastructure market. With its merger, the company has expanded globally, both with its employees and its customers.
- Frost & Sullivan believes that the company's work with the O-RAN Alliance will be beneficial in the long run, as the open and virtual RAN market grows and becomes the norm.

Samsung Networks

INNOVATION

- Samsung is a global company and has proven its ability to scale its innovations to support the entire world. In the network infrastructure space, however, Samsung started the 5G era with a limited geographical reach. It has been actively extending that reach: the majority of its customers are in South Korea, Japan, the United States, and India, and now the company is expanding into Europe.
- Samsung's product portfolio includes RAN and core/edge network solutions for 4G and 5G. The company's RAN offerings include an open and virtual solution in addition to traditional solutions; Samsung was the first of the leading suppliers to enter this new domain, demonstrating its ability to innovate. The company also offers private 5G solutions and is utilizing AI to automate its network solutions. The company is a founding member of the AI-RAN Alliance.
- The company invests in R&D to support its growing network infrastructure business. However, the R&D investment from Samsung Electronics (the parent company) overall remains lower than that of other network infrastructure suppliers.
- The company is a strong supporter of the open and virtual RAN movement. Samsung is the only major RAN supplier to have large-scale commercial vRAN (virtual RAN) deployments in North America, Europe, and Asia.

Samsung Networks (continued)

GROWTH

- Samsung's 5G network infrastructure market share and revenue are larger than its comparable 4G metrics. Samsung has grown strongly in the United States and India and is now looking to do the same in Europe.
- The company had success in the 4G market, even with its limited geographic reach, giving it a strong growth pipeline—even stronger as CSPs look for alternatives to Chinese suppliers.
- Samsung was the first large supplier to enter the open and virtual RAN market. Frost & Sullivan believes this will accelerate growth in coming years.

Samsung Networks (continued)

FROST PERSPECTIVE

- With geopolitical issues involving Chinese suppliers, Samsung may be the network infrastructure supplier that stands to benefit the most. Most of the new RAN suppliers are relatively small, which may concern a CSP looking to replace a Huawei or a ZTE.
- Samsung has 4G experience with RAN and core and is a large, well-known company. Samsung offers both traditional and open RAN solutions. Frost & Sullivan believes the potential for open and virtual RAN in the next decade is huge.
- The company is also active in the private cellular network space, which is still relatively small but holds much potential.
- Frost & Sullivan believes that now is the perfect opportunity for Samsung to expand its reach and offer its 5G network infrastructure solutions to more countries around the world.

ZTE

INNOVATION

- With success in previous generations of wireless infrastructure, ZTE has proven its ability to scale innovations globally. The company reports customers in more than 160 countries.
- The company's product portfolio includes all areas of 5G network infrastructure, as well as previous generations. This includes traditional RAN and private networks, as well as AI to automate its networks.
- ZTE invests significant amounts in R&D; this is essential in an industry where technology is always evolving. For 2025, ZTE invested 17% of revenue toward R&D.
- ZTE is deeply involved in global standardization efforts, including the 3GPP and the O-RAN Alliance, but has not yet announced an open and virtual RAN solution.

ZTE (continued)

GROWTH

- As a leader in 4G network infrastructure, ZTE enters the 5G market with a good-sized customer base. Rapid expansion of 5G in China, where ZTE has a significant customer base, has led the company to gain market share in 5G network infrastructure.
- The company is also involved with private cellular networks. While currently a small submarket, Frost & Sullivan believes the growth potential is huge.
- The company's growth pipeline outside of China is being hurt by political battles over Chinese suppliers and their ties to the Chinese government. The United States continues to push other countries to ban ZTE (and Huawei) in their mobile networks.

ZTE (continued)

FROST PERSPECTIVE

- Frost & Sullivan believes that participating in the open and virtual RAN movement is essential because the market is poised for significant growth. ZTE is involved in the O-RAN Alliance but has not announced an open and virtual RAN solution (at least publicly). Offering open and virtual RAN solutions will help ZTE protect its overall RAN market share.
- The political pressure from the United States did not lessen under the Biden administration, and the second Trump administration has not offered any relief. Frost & Sullivan believes politics should not be such a factor in the 5G network infrastructure market, yet it continues to be.

FROST & SULLIVAN

Best Practices & Growth Opportunities

Best Practices

1. 5G network infrastructure is highly technical and always evolving. This makes strong investment in R&D a key indicator of the potential of a network infrastructure supplier.

2. The 5G RAN market remains large but also low margin. This means that suppliers must focus on profitability as well long-term financial stability to survive and thrive. The market is highly concentrated—the top 5 RAN suppliers control more than 90% of the market—yet all have down years.

3. CSPs globally need to more effectively monetize their investments in 5G. However, way too many have not completed the transition from 5G non-standalone to 5G SA. The promises of 5G cannot be realized without a complete 5G network—and neither can effective monetization. 2025 saw some increase movement to 5G SA.

Growth Opportunities

1. 5G network infrastructure for public networks remains the largest part of the market—many tens of billions of dollars annually—but this submarket tends to exhibit slow growth over time. This growth opportunity is huge dollar-wise but slow growing over time.

2. Private 5G networks expand the potential customer base from a few thousand CSPs to potentially millions of enterprises. While this submarket is small compared to the public 5G network market—yet still measured in the billions of dollar—it is growing much faster. Private 5G networks will provide an exciting and lucrative growth opportunity over at least the next decade.

3. Open and virtual RAN is becoming more mainstream but remains a relatively small part of overall RAN sales. Like private 5G networks, open and virtual RAN remains a small submarket, but growth over the next few years should be significant. Open and virtual RAN can play a role in private 5G networks as well. Frost & Sullivan is bullish on open and virtual RAN as a growth opportunity over the decade.

FROST & SULLIVAN

Frost Radar™ Analytics

Frost Radar™: Benchmarking Future Growth Potential 2 Major Indices, 10 Analytical Ingredients, 1 Platform

Growth Index

Growth Index (GI) is a measure of a company's growth performance and track record, along with its ability to develop and execute a fully aligned growth strategy and vision; a robust growth pipeline system; and effective market, competitor, and end-user focused sales and marketing strategies.

GI1

MARKET SHARE (PREVIOUS 3 YEARS)
This is a comparison of a company's market share relative to its competitors in a given market space for the previous 3 years.

GI2

REVENUE GROWTH (PREVIOUS 3 YEARS)
This is a look at a company's revenue growth rate for the previous 3 years in the market/industry/category that forms the context for the given Frost Radar.

GI3

GROWTH PIPELINE
This is an evaluation of the strength and leverage of a company's growth pipeline system to continuously capture, analyze, and prioritize its universe of growth opportunities.

GI4

VISION AND STRATEGY
This is an assessment of how well a company's growth strategy is aligned with its vision. Are the investments that a company is making in new products and markets consistent with the stated vision?

GI5

SALES AND MARKETING
This is a measure of the effectiveness of a company's sales and marketing efforts in helping it drive demand and achieve its growth objectives.

Source: Frost & Sullivan

Frost Radar™: Benchmarking Future Growth Potential 2 Major Indices, 10 Analytical Ingredients, 1 Platform

Innovation Index

Innovation Index (II) is a measure of a company's ability to develop products/ services/ solutions (with a clear understanding of disruptive megatrends) that are globally applicable, are able to evolve and expand to serve multiple markets and are aligned to customers' changing needs.

II1

INNOVATION SCALABILITY
This determines whether an organization's innovations are globally scalable and applicable in both developing and mature markets, and also in adjacent and non-adjacent industry verticals.

II2

RESEARCH AND DEVELOPMENT
This is a measure of the efficacy of a company's R&D strategy, as determined by the size of its R&D investment and how it feeds the innovation pipeline.

II3

PRODUCT PORTFOLIO
This is a measure of a company's product portfolio, focusing on the relative contribution of new products to its annual revenue.

II4

MEGATRENDS LEVERAGE
This is an assessment of a company's proactive leverage of evolving, long-term opportunities and new business models, as the foundation of its innovation pipeline. An explanation of megatrends can be found here.

II5

CUSTOMER ALIGNMENT
This evaluates the applicability of a company's products/services/solutions to current and potential customers, as well as how its innovation strategy is influenced by evolving customer needs.

FROST & SULLIVAN

Next Steps: Leveraging the Frost Radar™ to Empower Key Stakeholders

Significance of Being on the Frost Radar™

Companies plotted on the Frost Radar™ are the leaders in the industry for growth, innovation, or both. They are instrumental in advancing the industry into the future.

GROWTH POTENTIAL

Your organization has significant future growth potential, which makes it a Company to Action.

BEST PRACTICES

Your organization is well positioned to shape Growth Pipeline™ best practices in your industry.

COMPETITIVE INTENSITY

Your organization is one of the key drivers of competitive intensity in the growth environment.

CUSTOMER VALUE

Your organization has demonstrated the ability to significantly enhance its customer value proposition.

PARTNER POTENTIAL

Your organization is top of mind for customers, investors, value chain partners, and future talent as a significant value provider.

Frost Radar™ Empowers the CEO's Growth Team

STRATEGIC IMPERATIVE

- Growth is increasingly difficult to achieve.
- Competitive intensity is high.
- More collaboration, teamwork, and focus are needed.
- The growth environment is complex.

LEVERAGING THE FROST RADAR™

- The Growth Team has the tools needed to foster a collaborative environment among the entire management team to drive best practices.
- The Growth Team has a measurement platform to assess future growth potential.
- The Growth Team has the ability to support the CEO with a powerful Growth Pipeline™.

NEXT STEPS

- **Growth Pipeline Audit™**
- **Growth Pipeline as a Service™**
- **Growth Pipeline™ Dialogue with Team Frost**

Source: Frost & Sullivan

Frost Radar™ Empowers Investors

STRATEGIC IMPERATIVE

- Deal flow is low and competition is high.
- Due diligence is hampered by industry complexity.
- Portfolio management is not effective.

LEVERAGING THE FROST RADAR™

- Investors can focus on future growth potential by creating a powerful pipeline of Companies to Action for high-potential investments.
- Investors can perform due diligence that improves accuracy and accelerates the deal process.
- Investors can realize the maximum internal rate of return and ensure long-term success for shareholders
- Investors can continually benchmark performance with best practices for optimal portfolio management.

NEXT STEPS

- **Growth Pipeline™ Dialogue**
- **Opportunity Universe Workshop**
- **Growth Pipeline Audit™ as Mandated Due Diligence**

Source: Frost & Sullivan

Frost Radar™ Empowers Customers

STRATEGIC IMPERATIVE

- Solutions are increasingly complex and have long-term implications.
- Vendor solutions can be confusing.
- Vendor volatility adds to the uncertainty.

LEVERAGING THE FROST RADAR™

- Customers have an analytical framework to benchmark potential vendors and identify partners that will provide powerful, long-term solutions.
- Customers can evaluate the most innovative solutions and understand how different solutions would meet their needs.
- Customers gain a long-term perspective on vendor partnerships.

NEXT STEPS

- **Growth Pipeline™ Dialogue**
- **Growth Pipeline™ Diagnostic**
- **Frost Radar™ Benchmarking System**

Frost Radar™ Empowers the Board of Directors

STRATEGIC IMPERATIVE

- Growth is increasingly difficult; CEOs require guidance.
- The Growth Environment requires complex navigational skills.
- The customer value chain is changing.

LEVERAGING THE FROST RADAR™

- The Board of Directors has a unique measurement system to ensure oversight of the company's long-term success.
- The Board of Directors has a discussion platform that centers on the driving issues, benchmarks, and best practices that will protect shareholder investment.
- The Board of Directors can ensure skillful mentoring, support, and governance of the CEO to maximize future growth potential.

NEXT STEPS

- **Growth Pipeline Audit™**
- **Growth Pipeline as a Service™**

Source: Frost & Sullivan

Next Steps

JOIN:
Growth Council

APPLY:
Companies to Action

ENGAGE:
Growth Dialog

PARTICIPATE:
Growth Council Think Tank

Does your current system support rapid adaptation to emerging opportunities?

Source: Frost & Sullivan

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