= Juniper Networks =

Juniper Networks is a multinational corporation headquartered in Sunnyvale , California that develops and markets networking products . Its products include routers , switches , network management software , network security products and software @-@ defined networking technology .

Juniper was founded in 1996 by Pradeep Sindhu . The company received several rounds of funding from venture capitalists and telecommunications companies before going public in 1999 . Juniper grew to $ 673 million in annual revenues by 2000 . By 2001 it had a 37 percent share of the core routers market , challenging Cisco 's once @-@ dominant market @-@ share . It grew to $ 4 billion in revenues by 2004 and $ 4 @.@ 63 billion in 2014 . Juniper appointed Kevin Johnson as CEO in 2008 , Shaygan Kheradpir in 2013 and Rami Rahim in 2014 .

Juniper Networks originally focused on core routers , which are used by internet service providers (ISPs) to perform IP address lookups and direct internet traffic . Through the acquisition of Unisphere in 2002 , Juniper entered the market for edge routers , which are used by ISPs to route internet traffic to individual consumers . Juniper entered the IT security market with its own JProtect security toolkit in 2003 , before acquiring security company NetScreen Technologies the following year . It entered the enterprise segment in the early 2000s , which accounted for one @-@ third of revenues by 2005 . As of 2014 , Juniper has been focused on developing new software @-@ defined networking products . However , in 2016 , the company encountered some controversy under suspicion allegedly putting backdoors into its ScreenOS products .

= = History = =

= = = Origins and funding = = =

Juniper Networks was founded in February 1996 by Pradeep Sindhu , a scientist with Xerox ? s Palo Alto Research Center (PARC) . He conceived the idea for Juniper while on vacation in 1995 . At the time most routers used for internet traffic were intended for phone calls and had dedicated circuits for each caller ; he wanted to create packet @-@ based routers that were optimized for internet traffic . Sindhu was joined by engineers Bjorn Liencres from Sun Microsystems and Dennis Ferguson from MCI Communications .

Sindhu started Juniper Networks with $ 2 million in seed funding , which was followed by $ 12 million in funding in the company 's first year of operations . About seven months after the company 's founding , Scott Kriens was appointed CEO to manage the business , while founder Sindhu became the Chief Technology Officer . By February 1997 , Juniper had raised $ 8 million in venture funding . Later that year , Juniper raised an additional $ 40 million in investments from a round that included four out five of the largest telecommunications equipment manufacturers : Siemens , Ericsson , Nortel and 3Com . Juniper also received $ 2 @.@ 5 million from Qwest and other investments from AT & T.

= = = Growth and IPO = = =

Juniper had $ 3 @.@ 8 million in annual revenue in 1998 . By the following year , its only product , the M40 router , was being used by 50 telecommunications companies . Juniper signed agreements with Alcatel and Ericsson to distribute the M40 internationally . A European headquarters was established in the United Kingdom and an Asia @-@ Pacific headquarters in Hong Kong . A subsidiary was created in Japan and offices were established in Korea in 1999 . Juniper 's market share for core routers grew from 6 % in 1998 to 17 @.@ 5 % one year later , and 20 % by April 2000 .

Juniper filed for an initial public offering in April 1999 and its first day on the NASDAQ was that June . The stock set a record in first @-@ day trading in the technology sector by increasing 191 % to a

market capitalization of $ 4 @.@ 9 billion . According to Telephony , Juniper Networks became the " latest darling of Wall Street " , reaching a $ 7 billion valuation by late July . Within a year , the company 's stock grew five @-@ fold .

Juniper 's revenues grew 600 % in 2000 to $ 673 million . That same year , Juniper moved its headquarters from Mountain View to Sunnyvale , California .

= = = Competition = = =

By 2001 , Juniper controlled one @-@ third of the market for high @-@ end core routers , mostly at the expense of Cisco Systems sales . According to BusinessWeek , " analysts unanimously agree [d] that Juniper 's boxes [were] technically superior to Cisco 's because the hardware does most of the data processing . Cisco routers still relied on software , which often results in slower speeds . " However , Cisco provided a broader range of services and support and had an entrenched market position . The press often depicted Juniper and Cisco as a " David versus Goliath " story . Cisco had grown through acquisitions to be a large generalist vendor for routing equipment in homes , businesses and for ISPs , whereas Juniper was thought of as the " anti @-@ Cisco " for being a small company with a narrow focus .

In January 2001 , Cisco introduced a suite of router products that BusinessWeek said was intended to challenge Juniper 's increasing market @-@ share . According to BusinessWeek , Juniper 's top @-@ end router was four times as fast at only twice the cost of comparable Cisco products . Cisco 's routers were not expected to erode Juniper 's growing share of the market , but other companies such as Lucent , Alcatel , and startups Avici Systems and Pluris had announced plans to release products that would out @-@ pace Juniper 's routers .

Juniper introduced a suite of routers for the network edge , where it would also compete with Cisco . Juniper 's edge routers had a 9 % market share two months after release . Both companies made exaggerated marketing claims ; Juniper promoted its products as stable enough to make IT staff bored and Cisco announced lab tests from Light Reading proved its products were superior to Juniper , whereas the publication itself reached the opposite conclusion . By 2002 , both companies were repeatedly announcing products with faster specifications than the other in what Network World called a " ' speeds @-@ and @-@ feeds ' public relations contest " .

By 2004 , Juniper controlled 38 % of the core router market . By 2007 , it had a 5 % , 18 % and 30 % share of the market for enterprise , edge and core routers respectively . Alcatel @-@ Lucent was unsuccessful in challenging Juniper in the core router market , but continued competing with Juniper in edge routers , along with Cisco .

= = = Further development = = =

In late 2000 , Juniper formed a joint venture with Ericsson to develop and market network switches for internet traffic on mobile devices , and with Nortel for fiber optic technology . In 2001 , Juniper introduced a technical certification program and was involved in the first optical internet network in China . Juniper 's growth slowed in 2001 as the telecommunications sector experienced a slowdown and revenues fell by two @-@ thirds during the dot @-@ com bust . 9 to 10 % of its workforce was laid off .

Juniper had rebounded by 2004 , surpassing $ 1 billion in revenues for the first time that year and reaching $ 2 billion in revenue in 2005 . Beginning in 2004 , with the acquisition of NetScreen , Juniper Networks began developing and marketing products for the enterprise segment . Juniper had a reputation for serving ISPs , not enterprises , which it was trying to change . By 2005 enterprise customers accounted for one @-@ third of the company 's revenues , but it had spent $ 5 billion in acquisitions and R & D for the enterprise market .

In 2006 , more than 200 US companies restated their financial results due to a series of investigations into stock backdating practices . Juniper stockholders alleged the company engaged in deceptive backdating practices that benefited its top executives unfairly . In December 2006 , Juniper restated its financials , charging $ 900 million in expenses to correct backdated stock

options from 1999 to 2003 . This was followed by a $ 169 million settlement with stockholders in February 2010 .

= = = 2008 ? present = = =

In July 2008 Juniper 's first CEO , Scott Kriens , became chairman and former Microsoft executive Kevin Johnson was appointed CEO . Johnson focused the company more on software , creating a software solutions division headed by a former Microsoft colleague , Bob Muglia . Juniper also hired other former Microsoft executives to focus on the company 's software strategy and encourage developers to create software products that run on the Junos operating system . Juniper established partnerships with IBM , Microsoft and Oracle for software compatibility efforts . The SSL / VPN Pulse product family was launched in 2010 , then later spun off to a private equity firm in 2014 for $ 250 million .

In 2012 , Juniper laid off 5 % of its staff and four of its high @-@ ranking executives departed . The following year , CEO Kevin Johnson announced he was retiring once a replacement was found . In November 2013 , Juniper Networks announced that Shaygan Kheradpir would be appointed as the new CEO . He started the position in January 2014 .

In January 2014 , hedge fund , activist investor and Juniper shareholder Elliott Associates advocated that Juniper reduce its cash reserves and cut costs , before Kheradpir was officially appointed . That February , Juniper reached an agreement with Elliott and other stakeholders for an Integrated Operating Plan (IOP) that involved repurchasing $ 2 billion in shares , reducing operating expenses by $ 160 million and appointing two new directors to its board . That April , 6 % of the company 's staff were laid off to cut expenses . In November 2014 , Kheradpir unexpectedly resigned following a review by Juniper 's board of directors regarding his conduct in a negotiation with an unnamed Juniper customer . An internal Juniper executive , Rami Rahim , took his place as CEO .

In May 2014 , Palo Alto Networks agreed to pay a $ 175 million settlement for allegedly infringing on Juniper 's patents for application firewalls .

= = Acquisitions and investments = =

By 2001 , Juniper had made only a few acquisitions of smaller companies , due to the leadership 's preference for organic growth . The pace of acquisition picked up in 2001 and 2002 with the purchases of Pacific Broadband and Unisphere Networks . In 2004 Juniper made a $ 4 billion acquisition of network security company NetScreen Technologies . Juniper revised NetScreen 's channel program that year and used its reseller network to bring other products to market .

Juniper made five acquisitions in 2005 , mostly of startups with deal values ranging from $ 8 @.@ 7 to $ 337 million . It acquired application @-@ acceleration vendor Redline Networks , VOIP company Kagoor Networks , as well as wide area network (WAN) company Peribit Networks . Peribit and Redline were incorporated into a new application products group and their technology was integrated into Juniper 's infranet framework . Afterwards , Juniper did not make any additional acquisitions until 2010 .

From 2010 to September 2011 , Juniper made six acquisitions and invested in eight companies . Often Juniper acquired early @-@ stage startups , developing their technology , than selling it to pre @-@ existing Juniper clients . Juniper acquired two digital video companies , Ankeena Networks and Blackwave Inc . , as well as wireless LAN software company Trapeze Networks . In 2012 , Juniper acquired Mykonos Software , which develops security software intended to deceive hackers already within the network perimeter. and a developer of software @-@ defined network controllers , Contrail Systems . In 2014 Juniper acquired the software @-@ defined networking (SDN) company WANDL .

= = Products = =

Juniper Networks designs and markets IT networking products , such as routers , switches and IT security products . It started out selling core routers for ISPs , and expanded into edge routers , data centers , wireless networking , networking for branch offices and other access and aggregation devices .

Juniper is the third largest market @-@ share holder overall for routers and switches used by ISPs . According to analyst firm Dell 'Oro Group , it is the fourth largest for edge routers and second for core routers with 25 % of the core market . It is also the second largest market share holder for firewall products with a 24 @.@ 8 % share of the firewall market . In data center security appliances , Juniper is the second @-@ place market @-@ share holder behind Cisco . In WLAN , where Juniper holds a joint development and marketing agreement with Aruba Networks , it holds a more marginal market share . Juniper provides technical support and services through the J @-@ Care program .

As of February 2015 , Juniper 's product families include the following :

= = = Routers and switches = = =

Juniper Networks ' first product was the Junos router operating system , which was released on July 1 , 1998 . The first Juniper router was made available that September and was a core router for internet service providers called the M40 . It incorporated specialized Application @-@ specific integrated circuits (ASIC) for routing internet traffic that were developed in partnership with IBM . It had ten times the throughput of comparable contemporary Cisco products . The M40 was followed by the smaller M20 router in December 1999 and the M160 in March 2000 .

By 2000 , Juniper had developed five hardware systems and made seven new releases of its Junos operating system . That April , Juniper released the second generation of the internet processors embedded in its core routers . In April 2002 , Juniper released the first of the T @-@ series family (originally known under the code @-@ name Gibson) , which could perform four times as many route lookups per second as the M160 . The first products of the TX Matrix family , which could be used to combine up to four T @-@ series routers , was released in December 2004 .

By 2003 , Juniper had diversified into three major router applications : core routers , edge routers and routers for mobile traffic . Juniper 's first major diversification from core routers was when it entered the market for edge routers , by acquiring the e @-@ series product family (originally known as ERX) through the purchase of Unisphere in 2000 . By 2002 , both Cisco and Juniper had increased their focus on edge routers , because many ISPs had built up abundant bandwidth at the core . Several improvements to Juniper 's software and its broadband aggregation features were released in late 2003 . At this time , Juniper had the largest market @-@ share (52 %) of the broadband aggregation market . In 2003 , Juniper entered the market for cable @-@ modem termination systems with the G @-@ series product family after the acquisition of Pacific Broadband . The product family was discontinued later that year .

Juniper 's first enterprise switch product was the EX 4200 , which was released in 2008 . In a comparative technical test , Network World said the EX4200 was the top performer out of network switches they tested in latency and throughput , but its multicast features were " newer and less robust " than other aspects of the product . Juniper Networks announced the T1600 1 @.@ 6 Terabits per second core router in 2007 and the newer T4000 4 Terabit router in 2010 . In 2012 it released the ACX family of universal access routers . In 2013 , the company made several new releases in the MX family of edge routers : it introduced a smaller version of its core routers called PTX3000 , and several new enterprise routers were released . Seven months later , Juniper acquired WANDL , and its technology was integrated into the NorthStar WAN controller Juniper announced in February 2014 .

In February 2011 , Juniper introduced QFabric , a proprietary protocol methodology for transferring data over a network using a single network layer . Several individual products for the QFabric methodology were released throughout the year . In October 2013 Juniper introduced another network architecture called MetaFabric and a new set of switches , the QFX5100 family , as one of the foundations of the new architecture .

In February 2014 , several software and hardware improvements were introduced for Juniper routers , including a series of software applications ISPs could use to provide internet @-@ based services to consumers . In December 2014 , Juniper introduced a network switch , OCX1100 , that could run on either the Junos operating system or the Open Compute Project open @-@ source software .

Security

Juniper Networks introduced the JProtect security toolkit in May 2003 . It included firewalls , flow monitoring , filtering and Network Address Translation (NAT) . Through the 2004 acquisition of NetScreen Technologies , Juniper acquired the Juniper Secure Meeting product line , as well as remote desktop access software . The NetScreen @-@ 5GT ADSL security appliance was the first new NetScreen product Juniper introduced after the acquisition and its first wireless product . The first Juniper product intended for small businesses was a remote access appliance that was released in August 2004 . An open interface for the development of third party tools for the appliance was made available that September .

In September 2004 , Juniper entered the market for enterprise access routers with three routers that were the first of the J @-@ series product family . It used the channel partners acquired with NetScreen to take the routers to market . Juniper released its first dedicated Network Access Control (NAC) product in late 2005 , which was followed by the acquisition of Funk Software for its NAC capabilities for switches . According to a 2006 review in Network World , Juniper 's SSG 520 firewall and routing product was " the first serious threat " to competing products from Cisco . Juniper released the SRX family of gateway products in 2008 . The gateways sold well , but customers and resellers reported a wide range of technical issues starting in 2010 , which Juniper did not acknowledge until 2012 , when it began providing updates to the product software .

In August 2011 , Juniper and AT & T announced they would jointly develop the AT & T Mobile Security application based on Juniper 's Pulse security software . In May 2012 , Juniper released a series of new features for the web security software it acquired from Mykonos Software that February . Mykonos ' software is focused on deceiving hackers by presenting fake vulnerabilities and tracking their activity . In January 2014 , Juniper announced the Firefly Suite of security and switching products for virtual machines . The following month , Juniper released several products for " intrusion deception " , which create fake files , store incorrect passwords and change network maps in order to confuse hackers that have already penetrated the network perimeter .

An analysis of Juniper 's ScreenOS firmware code in December 2015 discovered a backdoor key using Dual _ EC _ DRBG allowing to passively decrypt the traffic encrypted by ScreenOS . This backdoor was inserted in the year 2008 into the versions of ScreenOS from 6.2.0r15 to 6.2.0r18 and from 6.3.0r12 to 6.3.0r20 and gives any user administrative access when using a special master password . Some analysts claim that this backdoor still exists in ScreenOS . Stephen Checkoway was quoted in Wired that " If this backdoor was not intentional , then , in my opinion , it ? s an amazing coincidence . "

In December 2015 Juniper Systems announced that they had discovered " unauthorized code " in the ScreenOS software that underlies their NetScreen devices , present from 2012 onwards . There were two vulnerabilities : One was a simple root password backdoor , and the other one was changing a point in Dual _ EC _ DRBG so that the attackers presumably had the key to use the preexisting (intentional or unintentional) kleptographic backdoor in ScreenOS to passively decrypt traffic .

Software defined networking

According to a 2014 SWOT analysis by MarketLine , in recent history Juniper has been focusing on software @-@ defined networking (SDN) . It acquired SDN company Contrail Systems in December 2012 . The following month Juniper announced its SDN strategy , which included a new licensing model based on usage and new features for the Junos operating system . In February

2013 , Juniper released several SDN products , including the application provisioning software , Services Activation Director and the Mobile Control Gateway appliance .

In May 2013 , Juniper announced an SDN controller called JunosV Contrail , using technology it acquired through Contrail Systems . A series of SDN products were released in February 2014 , such as a network management software product , Junos Fusion , and an SDN controller called NorthStar . Northstar helps find the optimal path for data to travel through a network .

= = = Recent updates = = =

In March 2015 , Juniper announced a series of updates to the PTX family of core routers , the QFX family of switches , as well as updates to its security portfolio .

According to a report published by technology consulting firm LexInnova in June 2015 , Juniper Networks is the third largest recipient of network security @-@ related patents with portfolio of 2 @,@ 926 security @-@ related patents .

= = Operations = =

Juniper Networks has operations in more than 100 countries . Around 50 % of its revenue is from the United States , 30 % are from EMEA and 20 % are from Asia . Juniper sells directly to businesses , as well as through resale and distribution partners , such as Ericsson , IBM , Nokia , IngramMicro and NEC . About 50 % of Juniper 's revenues are derived from routers , 13 % from switches , 12 % comes from IT security and 25 % from services .

According to a 2013 report by Glassdoor , Juniper Networks has the highest paid software engineers in the technology sector by a margin of about $ 24 @,@ 000 per year . It operates the Juniper Network 's Academic Alliance program , which scouts fresh college graduates .

According to a SWOT analysis by MarketLine , Juniper has " a strong focus " on research and development . R & D expenses have been between 22 and 25 % of revenue from 2011 to 2013 . Most of the company 's manufacturing is outsourced to three manufacturing companies : Celestica , Flextronics and Accton Technology . Juniper operates the Junos Innovation Fund , which was started with $ 50 million in 2010 and invests in early @-@ stage technology companies developing applications for the Junos operating system . As of 2011 , Juniper had invested in 20 companies . This is estimated to be 1 to 2 % of the companies it has evaluated for a potential investment .