

# CAMPUS NETWORKING

## QUICK REFERENCE GUIDE

Last update: July 2020

S-Series	Campus Core: PowerSwitch S4100 Series			
Overview	Next generation open networking switches for enterprise, mid-market and Tier2 cloud service providers with demanding compute and storage traffic environments			
Models (all sized 1RU)	S4112F-ON	S4112T-ON	S4128F-ON	S4128T-ON
<b>Performance</b>				
Switching capacity (full duplex)	840 Gbps	840 Gbps	960 Gbps	960 Gbps
Forwarding Capacity (Mpps)	625	625	714	714
Buffer size	12MB	12MB	12MB	12MB
<b>Ports</b>				
FC8/FC16	N/A	N/A	N/A	N/A
FC8/FC16/FC32	N/A	N/A	N/A	N/A
1/10GBase-T	N/A	12	N/A	28
10GbE	12	N/A	36	36
25GbE	12	12	8	8
40GbE	12 (breakout)	12 (breakout)	2	2
50GbE	3	3	4	4
100GbE	6	6	2	2
Expansion module slots (Modules support speed indicated)	3	3	N/A	N/A
<b>Power and cooling</b>				
Max. power consumption (W)	180 (max) / 90 (normal)	200 (max) / 120 (normal)	260 (max)/160 (normal)	300 (max)/250 (normal)
Power options	Fixed power supply		AC or DC	AC or DC
Redundant power supplies	Redundant Fixed fans		2	2
Airflow	Normal or reverse air flow		Normal or Reverse	
<b>Features</b>				
Stacking	Not currently available			
Operating system	Dell EMC Networking OS10 and select 3rd party OS			
Industry-standard CLI	Dell EMC Networking OS10 and several 3rd party OS			
iSCSI optimization storage features	iSCSI optimization and FSB			
Max L2 VLANs and L3 VLANs	4KL2/500L3		500 L3 VLANs	
Max MAC entries	272K		272K	
Link aggregation (groups/Members)	32 links per group, 128 groups		32 links per group, 128 groups	
Max routes (IPv4/IPv6)	200K/130K		200K/130K	
Jumbo frames (Bytes)	9,416		9,416	
IPv4 routing	RIP, OSPF, BGP		OSPF, BGP, PBR	
IPv6 routing	OSPFv3, ICMPv6		OSPFv3	
Multicast routing	IGMP		In process	

S-Series	Campus Core: PowerSwitch S4100 Series			
Overview	Next generation open networking switches for enterprise, mid-market and Tier2 cloud service providers with demanding compute and storage traffic environments			
Models (all sized 1RU)	S4148F-ON	S4148T-ON	S4148FE-ON	S4148U-ON
<b>Performance</b>				
Switching capacity (full duplex)	1.76 Tbps	1.76 Tbps	1.76 Tbps	1.76 Tbps
Forwarding Capacity (Mpps)	759	759	759	759
Buffer size	12MB	12MB	12MB	12MB
<b>Ports</b>				
FC8/FC16	N/A	N/A	N/A	unified SFP+/SFP28
FC8/FC16/FC32	N/A	N/A	N/A	unified QSFP28
1/10GBase-T	N/A	48	N/A	N/A
10GbE	72	72	72	72
25GbE	16	16	16	16
40GbE	6	6	6	6
50GbE	8	8	8	8
100GbE	4	4	4	4
Expansion module slots (Modules support speed indicated)	N/A	N/A	N/A	N/A
<b>Power and cooling</b>				
Max. power consumption (W)	370 (max)/200 (normal)	440 (max)/320 (normal)	400(max)/240 (normal)	460 (max)/300 (normal)
Power options	AC or DC	AC or DC	AC or DC	AC or DC
Redundant power supplies	2	2	2	2
Airflow	Normal or Reverse			
<b>Features</b>				
Stacking	Not currently available			
Operating system	Dell EMC Networking OS10 and select 3rd party OS			
Industry-standard CLI	Dell EMC Networking OS10 and select 3rd party OS			
iSCSI optimization storage features	iSCSI optimization and FSB			iSCSI optimization, FSB, NPIV Proxy gateway, F_Port, FCoE/ FC hosts, FC zoning
Max L2 VLANs and L3 VLANs	500 L3 VLANs			
Max MAC entries	272K			
Link aggregation (groups/Members)	32 links per group, 128 groups			
Max routes (IPv4/IPv6)	200K/130K			
Jumbo frames (Bytes)	9,416			
IPv4 routing	OSPF, BGP, PBR			
IPv6 routing	OSPFv3, IGMPv6			
Multicast routing	IGMP			

S-Series	Campus Core: PowerSwitch S5200 Series: 10/25/40/50/100GbE				
<b>Overview</b>	Build a high-performance, cost-efficient data center leaf/spine fabric with this spine fabric switch	Provide optimum flexibility and cost-effectiveness for demanding compute and storage traffic environments	Double the amount of direct 25GbE ports with a ToR switch that features 96 x 25GbE SFP28	Low-density 1RU, half-width switch ideal for high-performance HCI connectivity	Low-density 1RU, full-width switch ideal for high-performance HCI connectivity
<b>Models (all sized 1RU, S5296F-ON 2RU)</b>	<b>S5232F-ON</b>	<b>S5248F-ON</b>	<b>S5296F-ON</b>	<b>S5212F-ON</b>	<b>S5224F-ON</b>
<b>Performance</b>					
Switching capacity (full duplex) (Tbps)	6.4	4.0	6.4	2.16	2.16
Forwarding capacity (Mpps)	1.5 Bpps	1.9 Bpps	1.5 Bpps	892	954
Buffer size	32MB	32MB	32MB	32MB	32MB
<b>Ports</b>					
1/10GBase-T	N/A	N/A	N/A	N/A	N/A
1GbE (SFP)	126	80	128	24	40
10GbE	128	80	128	24	40
25GbE	124	80	128	24	40
40GbE	32	8	8	3	4
50GbE	64	16	16	6	8
100GbE	32	8	8	3	4
Expansion module slots	N/A	N/A	N/A	N/A	N/A
<b>Power and cooling</b>					
Max. power consumption (W)	635	647	893	304	455
Power options	AC or DC	AC or DC	AC or DC	AC or DC	AC or DC
Redundant power (hot-swappable)	2	2	2	N/A	2
Airflow	Reversible	Reversible	Reversible	Normal or Reverse as orderable options, not reversible in the field	Reversible
<b>Features</b>					
Operating Systems	Dell EMC SmartFabric OS10 and select 3rd party OS				
Industry-standard CLI (Console, Telnet, SSHv1/v2)	Dell EMC networking and several 3rd party OS				
iSCSI optimization	iSCSI optimization and FSB	iSCSI optimization and FSB	iSCSI optimization and FSB	iSCSI optimization and FSB	iSCSI optimization and FSB
Max VLANs (Configured)	4K per port	4K per port	4K per port	4K per port	4K per port
Max MAC entries	160K	160K	160K	160K	160K
Link aggregation (Groups/Members)	16 links per group, 128 groups	16 links per group, 128 groups	16 links per group, 128 groups	16 links per group, 128 groups	16 links per group, 128 groups
Max routes (IPv4/IPv6)	128K/64K	128K/64K	128K/64K	128K/64K	128K/64K
IPv4 routing	RIP, OSPF, BGP	RIP, OSPF, BGP	RIP, OSPF, BGP	RIP, OSPF, BGP	RIP, OSPF, BGP
IPv6 routing	BGP-4, OSPFv3, ICMPv6 and DHCPv6	BGP-4, OSPFv3, ICMPv6 and DHCPv6	BGP-4, OSPFv3, ICMPv6 and DHCPv6	BGP-4, OSPFv3, ICMPv6 and DHCPv6	BGP-4, OSPFv3, ICMPv6 and DHCPv6
Multicast routing	IGMP, MLD	IGMP, MLD	IGMP, MLD	IGMP, MLD	IGMP, MLD

Series	1/1/10GbE (Layer 2/3 Switching): PowerSwitch N3000 Series					
Overview	Power efficient and resilient 1/10GbE switches with advanced Layer 3 distribution and dense PoE+ for small to medium-sized businesses and office wiring closets.					
Models (all sized 1RU)	N3024ET-ON	N3048ET-ON	N3024EF-ON	N3024EP-ON	N3048EP-ON	N3132PX-ON
<b>Performance</b>						
Switch capacity (Gbps)	212	260	212	212	260	328
Forwarding capacity (Mpps)	158	193	158	158	193	428
Buffer size	4MB					5MB
<b>Ports</b>						
10/100/1000 Base-T	24	48	-	24	48	32
5G Base-T	-	-	-	-	-	8
1GbE (SFP)	2 combo	2 combo	24	2 combo	2 combo	4
10GbE	2 fixed SFP+ and 2 modular (auto-negotiate 1/10Gb)					4
Expansion module slots	1 slot with 2 optional modules: 2 port SFP+, 2 port 10GBase-T					1
Power-over-Ethernet ports	-			24 PoE+	48 PoE+	32x 60w PoE
<b>Power and cooling</b>						
Max. power consumption (watts)	53.5	64.8	67.1	1287	2145	2067
AC power supplies	2 hot swappable power supply bays, 1 PSU included					1
Redundant power	Optional (internal)			Yes, dependent upon configuration		
Airflow	I/O panel to PSU					
<b>Features</b>						
Stacking	Stacks up to 12 using dedicated ports (N3132PX-ON requires optional stacking module)					
VLANs	4094					
VLAN support	Voice VLAN, Private Edge, Protocol and MAC-based, GVRP					
Layer 2 and 3	Layer 3 Advanced					
IPv4/IPv6 routing	IPv4/IPv6, RIP, OSPFv3, VRRP, static routing					
Multicast support	IGMP v1/v2/v3, IGMP Proxy, IGMP Snooping and Querier, DVMRP, PIM-DM, PIM-SM					
Rapid Deployment	Ready rails, deploy switch configuration files, stacking commands and firmware updates by simply inserting a USB device into the port.					
iSCSI optimization	iSCSI aware (detect and prioritize iSCSI traffic into pre-defined QoS); iSCSI auto-configuration (switch configuration routine automatically sets up and optimizes performance with Dell EqualLogic storage arrays)					
<b>Management and security</b>						
Switch security	Strong passwords, password masking, management access control - privilege levels. RADIUS and TACACS+ support, 802.1x port-based authentication.					
SNMP support	SNMPv1/2/3					
sFlow	Yes					
Management	GUI access via http/https. CLI via console, Telnet, SSH					

\* with external power supply

Series	PowerSwitch N2200 Series				PowerSwitch N2000 Series				
Overview	Power-efficient and resilient 1/2.5G Multigig switching solution with 30/60W PoE support, for mid-to-large enterprise access deployments.				Powerful 1/10GbE switches providing efficient Layer 2+ access for personal computers, entry-level servers and other network devices.				
Models (all sized 1RU)	N2224X	N2224PX	N2248X	N2248PX	N2024	N2048	N2024P	N2048P	N2128PX-ON
<b>Performance</b>									
Switch capacity (Gpps)	480		600		172	220	172	220	192
Forwarding capacity (Mpps)	667		833		128	164	128	164	256
Buffer size	4MB				4MB				2MB
<b>Ports</b>									
10/100/1000 Base-T	1 Out of Band Management Port				24	48	24	48	24
1GbE									2
2.5G Base-T	24		48						4
10GbE	-	-	-	-	2 SFP+ (auto-negotiate 1/10Gb)				
25GbE (SFP28)	4								
40GbE (QSFP+)	2								
Power-over-Ethernet ports	-	12x30W, 12x60W	-	24x30W, 24x60W	-	-	24 PoE+	48 PoE+	24xPoE 30W; 4xPoE 60W
<b>Power and cooling</b>									
Max. power consumption (watts)	238	1318	326	2486	42.9	53.9	913*	1738*	1039.8
AC power supplies	1								
Redundant power	550W AC	1050W internal pluggable and/or external MPS-1S or MPS-3S power shelf	550W AC	1600W internal pluggable and/or external MPS-1S or MPS-3S power shelf	External RPS-720			External MPS-1000	
Airflow	IO/PS, PS to IO	IO to PS	IO to PS, PS to IO	IO to PS	I/O panel to PSU				
<b>Features</b>									
Stacking	Stacks up to 12 using 40Gb user ports				Stacks up to 12 using dedicated ports (N3132PX-ON requires optional stacking module)				
VLANs	4094				4094				
VLAN support	Voice VLAN, Private Edge, Protocol and MAC-based, GVRP				Voice VLAN, Private Edge VLAN, Protocol-based VLANs, Guest VLANs, GVRP, 802.1x Auto VLAN				
Layer 2 and 3	Layer 3 Standard				Layer 3 Standard				
IPv4/IPv6 routing	IPv4/IPv6, RIP, OSPFv2/v3				IPv4/IPv6, static routing, RIP, OSPFv2				
Multicast support	IGMP v1/v2/v3, IGMP Proxy, IGMP Snooping and Querier, DVMRP, PIM-DM, PIM-SM				IGMP v1/2/3 snooping and querier				
Rapid Deployment	Deploy switch configuration files, stacking commands and firmware updates by simply inserting a USB device into the port								
<b>Management and security</b>									
Switch security	Strong passwords, password masking, management access control - privilege levels. RADIUS and TACACS+ support, 802.1x port-based authentication.								
SNMP support	SNMPv1/2/3								
sFlow	Yes								
Management	GUI access via http/https. CLI via console, Telnet, SSH								

\* with external power supply

Series	PowerSwitch N1100 Series						PowerSwitch N1500 Series			
Overview	Fully managed 1/10GbE Layer 2 switching with Open Networking capabilities									
<b>Models (all sized 1RU)</b>	N1108T-ON	N1108EP-ON	N1124T-ON	N1124P-ON	N1148T-ON	N1148P-ON	N1524	N1548	N1524P	N1548P
<b>Performance</b>										
Switch capacity (Gbps)	24	24	128	128	176	176	128	176	128	176
Forwarding capacity (Mpps)	18	18	96	96	132	132	128	164	128	164
Buffer size	1.5MB	1.5MB	2MB	2MB	2MB	2MB	1.5MB			
<b>Ports</b>										
10/100/1000 Base-T	8	8	10	24	48	48	24	48	24	48
1GbE (SFP)	2	2	2	N	N	N	-			
10GbE	N	4	4 SFP+ (auto-negotiate 1/10G)				4 SFP+ (auto-negotiate 1/10Gb)			
Power-over-Ethernet ports	N	8	N	12	N	24	-	-	24 PoE+	48 PoE+
<b>Power and cooling</b>										
Max. power consumption (watts)	10.47	19.51	19.3	249.6	30.18	459	30.2	44.6	871*	1704*
AC power supplies	1									
Redundant power	-						External RPS-720		External MPS-1000	
Airflow	IO to PSU (normal)	I/O to power supply; Pass through POE	IO to PSU (normal)				I/O panel to PSU			
<b>Features</b>										
Stacking	N/A		4			Up to 4 using SFP ports				
VLANs	512									
VLAN support	Voice VLAN, Private Edge, Protocol-based, Auto VLAN									
Layer 2 and 3	Layer 2 only					Layer 2 with static routing and RIP				
IPv4/IPv6 routing	-					IPv4/IPv6				
Multicast support	IPv4 MIB, IGMP v1/v2/v3 snooping and querier									
Rapid Deployment	Yes									
<b>Management and security</b>										
Switch security	Strong passwords, password masking, management access control - privilege levels, RADIUS and TACACS+ support, 802.1x port-based authentication					Switch access password protection. Restricted IP address. RADIUS support, 802.1x port-based auth.				
SNMP support	SNMP v1/2/3									
sFlow	v1.3 draft 5									
Management	GUI access via http/https. CLI via console, Telnet, SSH									

\* with external power supply

## CAMPUS WIRELESS

### Ruckus Wireless Solutions

Ruckus wireless solutions, including access points, controllers and analytics for Smart Cities and Smart Enterprises, innovate across wireless and wired technology to meet industry-specific needs and the most demanding use cases. Find the Quick Reference Guide and more at [DellTechnologies.com/Networking](http://DellTechnologies.com/Networking).



### Ruckus Wireless Access Points

Models	Overview
T310 / Unleashed T310d	Entry-level 802.11ac Wave 2 outdoor AP series with integrated BeamFlex+
E510	Embedded 802.11ac Outdoor Wave 2 WiFi AP with External BeamFlex+ Antennas
P300	Outdoor 2x2:2 5GHz 802.11ac point-to-point/multipoint bridge for long range backhaul
T610	Mid-range 802.11ac Wave 2 dual-concurrent AP with MU-MIMO and BeamFlex+
T710	High-end 802.11ac Wave 2 dual concurrent AP with BeamFlex+
R730	Ultra High Performance Wi-Fi 6 8x8:8 Indoor Access Point with 5.9 Gbps HE80/40 Speeds and Embedded IoT
R720	Indoor 802.11ac Wave 2 Wi-Fi Access Point with Multi-Gigabit Backhaul for Ultra-Dense Device Environments
R710	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Ultra-Dense Device Environments
R510 / R510 Unleashed	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Dense Device Environments
R320 / R320 Unleashed	Indoor 802.11ac Wave 2 Wi-Fi Access Point
R610	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Dense Device Environments
H510	Wall-Mounted 802.11ac Wave 2 Wi-Fi Indoor Access Point and Switch for Dense Environments
H320	Wall-Mounted 802.11ac Wave 2 Wi-Fi Indoor Access Point and Switch
M510	Mobile Indoor 802.11ac Wave 2 2x2:2 Wi-Fi Indoor Access Point (AP) with LTE Backhaul

### Ruckus Controllers

Models
ZoneDirector 1200
SmartZone 100
SmartZone 300
Virtual SmartZone
Virtual SmartZone Data Plane
Virtual SmartZone – H

### Ruckus Software

Software	Description
SmartCell Insight (SCI)	Big Data Wi-Fi analytics and reporting engine purpose built to help Enterprises make informed business decisions regarding the operation of their Wi-Fi networks
Geo Redundancy	Access Point management license for High Availability. Supported products (Standby mode only)
Split Tunnel	Manage corporate and local traffic by sending only corporate traffic to the controller and ensure that local traffic does not incur the overhead of the round trip to the controller, which decreases traffic on the WAN link and minimizes latency for local application traffic
CloudPath	SaaS platform that delivers secure wired and wireless network access for BYOD, guest users and IT-owned devices
Virtual SmartZone Data Plane	Offers secured tunneling of user data traffic that encrypts payload traffic, maintains flat network topology, enables mobility across L2 subnets, supports POS data traffic for PCI compliance, and offers differentiated per site policy control and QoS, etc.

## Dell OEM Comparison: Ruckus Wireless Indoor APs

Part Number	R730	R720	R710	R510 / R510 Unleashed	R320 / R320 Unleashed	R610	H510	H320	M510
Category	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor
Description	Ultra High Performance Wi-Fi 6 8x8:8 Indoor Access Point with 5.9 Gbps HE80/40 Speeds and Embedded IoT	Indoor 802.11ac Wave 2 Wi-Fi Access Point with Multi-Gigabit Backhaul for Ultra-Dense Device Environments	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Ultra-Dense Device Environments	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Dense Device Environments	Indoor 802.11ac Wave 2 Wi-Fi Access Point	Indoor 802.11ac Wave 2 Wi-Fi Access Point for Dense Device Environments	Wall-Mounted 802.11ac Wave 2 Wi-Fi Indoor Access Point and Switch for Dense Environments	Wall-Mounted 802.11ac Wave 2 Wi-Fi Indoor Access Point and Switch	Mobile Indoor 802.11ac Wave 2 2x2:2 Wi-Fi Indoor Access Point (AP) with LTE Backhaul
<b>General Specifications</b>									
Antenna Patterns, per band	4000+	4000+	4000+	64	64	512	4	4	64
Antenna Gain	Up to 2 dBi	Up to 3 dBi	Up to 3 dBi	Up to 3 dBi	Up to 3 dBi	Up to 3 dBi	Up to 1 dBi	Up to 3 dBi	Up to 3 dBi
BeamFlex	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ChannelFly	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Concurrent Users	1024	512	512	512	256	512	100	100	512
Controller Support	SmartZone, ZoneDirector	SmartZone, ZoneDirector	SmartZone and ZoneDirector	SmartZone, ZoneDirector, Unleashed	SmartZone, ZoneDirector, Unleashed	SmartZone, ZoneDirector	SmartZone, ZoneDirector	SmartZone, ZoneDirector	SmartZone, ZoneDirector
Ethernet Ports	1x 1/2.5/5 Gb/s   1x 10/100/1000 Mb/s	1 x 1GbE and 1 x 2.5GbE	2 x 1GbE	2 x 1GbE	1 x 1GbE	2 x 1GbE	5 x 1GbE	1 x 1GbE   2 x 10/100MbE	2 x 1GbE ports   RJ45
IoT Ready	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
PD-MRC	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
PHY Rate at 2.4 GHz, maximum	1148 Mb/s	600 Mb/s	600 Mb/s	300 Mb/s	300 Mb/s	450 Mb/s	300 Mb/s	150 Mb/s	300 Mb/s
PHY Rate at 5 GHz, maximum	2400 Mb/s	1733 Mb/s	1733 Mb/s	867 Mb/s	867 Mb/s	1300 Mb/s	867 Mb/s	867 Mb/s	867 Mb/s
Radio Chains:Streams	8x8:8 SU-MIMO & MU-MIMO	4x4:4 SU-MIMO & MU-MIMO	4x4:4 SU-MIMO 4x4:3 MU-MIMO	2x2:2	2x2:2	3x3:3	2x2:2	2x2:2 MU-MIMO 1x1:1 SU-MIMO	2x2:2 SU-MIMO 2x2:2 MU-MIMO
Rx Sensitivity at 5 GHz	-101 dBm	-104 dBm	-104 dBm	-103 dBm	-101 dBm	-100 dBm	-96 dBm	-96 dBm	-95 dBm
Rx Sensitivity at 2.4 GHz	-103 dBm	-104 dBm	-104 dBm	-103 dBm	-101 dBm	-100 dBm	-99 dBm	-99 dBm	-101 dBm
SmartMesh	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
USB	USB 2.0	USB 2.0	USB 2.0	USB 2.0		USB 2.0	USB 2.0		USB 2.0
Wi-Fi Interface Standard	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2
Wi-Fi Interface Standard at 2.4 GHz	802.11ax	802.11n	802.11n	802.11n	802.11n	802.11n	802.11n	802.11n	802.11n
Wi-Fi Interface Standard at 5 GHz	802.11ax	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac
<b>Environmental Specifications</b>									
Operating Temperature	0 °C to +50 °C (+32 °F to +122 °F)	-10 °C to +50 °C (+25 °F to +122 °F)	-4 °C to +60 °C (-14 °F to +140 °F)	0 °C to +50 °C (+32 °F to +122 °F)	0 °C to +40 °C (+32 °F to +104 °F)	0 °C to +40 °C (+32 °F to +104 °F)	0 °C to +40 °C (+32 °F to +104 °F)	0 °C to +40 °C (+32 °F to +104 °F)	-40 °C to +65 °C (-40 °F to +149 °F)



## Dell OEM Comparison: Ruckus Wireless Outdoor APs

Part Number	T310 / Unleashed T310d	E510	P300	T610	T710
Category	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
Description	Entry-level 802.11ac Wave 2 outdoor AP series with integrated BeamFlex+	Embedded 802.11ac Outdoor Wave 2 WiFi AP with External BeamFlex+ Antennas	Outdoor 2x2:2 5GHz 802.11ac point-to-point/multipoint bridge for long range backhaul	Mid-range 802.11ac Wave 2 dual concurrent AP with BeamFlex+	High-end 802.11ac Wave 2 dual concurrent AP with BeamFlex+
<b>General Specifications</b>					
Antenna Patterns, per band	64	64	NA	4000+	4000+
Antenna Gain	Up to 3 dBi for Omni	Up to 3 dBi	Up to 14 dBi	Up to 3 dBi for Omni	Up to 3 dBi for Omni
BeamFlex	Yes	Yes	No	Yes	Yes
ChannelFly	Yes	Yes	No	Yes	Yes
Concurrent Users	512	512	NA	512	512
Controller Support	SmartZone, ZD, Unleashed for T310d	SmartZone, ZoneDirector	WebUI/CLI	SmartZone, ZoneDirector	SmartZone, ZoneDirector
Ethernet Ports	1 x 1GbE	1 x 1GbE	1 x 1GbE	2 x 1GbE	2 x 1GbE
Fiber Interface	No	No	No	No	Yes
IoT Ready	Yes	Yes	No	Yes	No
PD-MRC	Yes	Yes	No	Yes	Yes
Max PHY Rate at 2.4G	300 Mb/s	300 Mb/s	NA	600 Mb/s	600 Mb/s
Max PHY Rate at 5 G	867 Mb/s	867 Mb/s	867 Mb/s	1733 Mb/s	1733 Mb/s
Radio Chains:Streams	2x2:2	2x2:2	2x2:2	4x4:4	4x4:4
Rx Sensitivity at 5 GHz	-101 dBm	-101 dBm	-96 dBm	-104 dBm	-104 dBm
Rx Sensitivity at 2.4G	-101 dBm	-101 dBm	NA	-104 dBm	-104 dBm
SmartMesh	Yes	Yes	No	Yes	Yes
USB	USB 2.0	USB 2.0	NA	USB 2.0	
Wi-Fi Standard	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/n/ac	IEEE 802.11a/b/g/n/ac Wave 2	IEEE 802.11a/b/g/n/ac Wave 2
Wi-Fi Standard at 2.4G	802.11n	802.11n	NA	802.11n	802.11n
Wi-Fi Standard at 5G	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac
<b>Environmental Specifications</b>					
Operating Temperature	"-40 °C to +65 °C (-40 °F to +149 °F) -20 °C to +65 °C for T310c"	-40 °C to +70 °C (-40 °F to +158 °F)	-40 °C to +65 °C (-40 °F to +149 °F)	-40 °C to +65 °C (-40 °F to +149 °F)	-40 °C to +65 °C (-40 °F to +149 °F)
Operating Temperature	0 °C to +50 °C (+32 °F to +122 °F)	-10 °C to +50 °C (+25 °F to +122 °F)	-4 °C to +60 °C (-14 °F to +140 °F)	0 °C to +50 °C (+32 °F to +122 °F)	0 °C to +40 °C (+32 °F to +104 °F)

## Dell OEM Comparison: Ruckus Wireless Controllers

Feature	SmartZone 100	SmartZone 300	Virtual SmartZone-E	Virtual SmartZone-H	ZoneDirector 1200	Unleashed
Number of APs supported	Up to 1,024 / 3,000 cluster	Up to 10,000 / 30,000 cluster	1,024 / 3K with cluster	10K / 30K with cluster	Up to 150	Up to 128
Clients	Up to 25,000 / 60,000 cluster	Up to 100,000 / 450,000 per cluster	25K / 60K per cluster	100K / 300K per cluster	Up to 4,000	Up to 2,048
Ethernet ports	1GE Model: 4 GbE ports	6 x 1GbE ports 4 x 10GbE ports	1 vNIC	1 or 3 vNIC	2 Ethernet ports, auto MDX, autosensing 1GbE	Refer to selected AP data sheet
Authentication support	802.1X, MAC address	802.1x, Local database, Active Directory, RADIUS, LDAP	802.1x, Local database, Active Directory, RADIUS, LDAP	802.1x, Local database, Active Directory, RADIUS, LDAP	802.1X, Local database, Active Directory, RADIUS, LDAP	802/1x, local database, Active Directory, RADIUS, LDAPr
Guest networking/captive portal	Yes	Yes	Yes	Yes	Yes	Yes
DHCP server	External or Assigned	External or Assigned	External or vSZ-D assigned	External or vSZ-D assigned	Yes	Yes
AP discovery and control	L2 / L3	L2 / L3	L2 / L3	L2 / L3	L2 / L3	L2
SSID/WLAN support	2,048 / 2,048 cluster	6,144 per SZ-300	2,048	6,144	256	16
Management Interface	Web GUI, CLI	Web GUI, CLI	Web GUI, SCI	Web GUI, SCI	Web GUI	Web GUI, CLI
Management protocol(s)	SNMP v3, RESTful JSON	SNMP v3, RESTful JSON	SNMP v3	SNMP v3	SNMP v3	SNMP v3
VLAN support	Dynamic VLANs	Dynamic VLANs	Dynamic VLANs	Dynamic VLANs	Dynamic VLANs	Yes
Data Plane	Tunneling or local breakout	Tunneling or local breakout	Tunneling or local breakout	Tunneling or local breakout	Tunneling or local breakout	Local breakout
Power supply	DC or AC	DC or AC	NA	NA	DC or AC	PoE
Fans	Redundant	Six redundant, field swappable fans in three sets	NA	NA	NA	NA

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