WAVESYS

Wavesys PowerSwitch
WNC-1100 Series Switches

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Fully managed 1/10GbE Layer 2 switching with Open Networking capabilities

The WNC-1100 switch series offers a power-efficient Gigabit Ethernet (GbE) network-access switching solution with integrated 1GbE and 10GbE uplinks. With high-performance capabilities and wire-speed performance, utilizing a non-blocking architecture to easily handle unexpected traffic loads, the switches offer simple management and scalability via a 1Gbps (full-duplex) high availability stacking architecture that
allows management of up to four switches from a single IP address. Fanless operation on select models, and features such as Energy-Efficient Ethernet and short cable detection provide energy efficiency to help decrease power and cooling costs.

Modernize campus network architectures
Modernize campus network architectures with a power- efficient and resilient 1/10GbE switching solution with up to 24 PoE/PoE+ ports. PoE power budgets up to 375W deliver clean power to network devices such as wireless access points (APs), Voiceover-IP (VoIP) handsets, video conferencing systems and security cameras.

Leverage familiar tools and practices
All WNC-Series switches include Wavesys Networking OS 6, designed for easier deployment, greater interoperability and a lower learning curve for network administrators. One common command line interface (CLI) and graphic user interface (GUI) using a well-known command language gets skilled network administrators productive quickly. The N1100 switch series also supports the Open Network Install Environment (ONIE), enabling installation of alternate network operating systems.

Deploy with confidence at any scale
WNC1100 series switches help create performance assurance with a data rate up to 176Gbps (full duplex) and a forwarding rate up to 164Mpps. Scale easily by stacking

with 10GbE ports. Switch stacks of up to 192 1GbE ports can be managed from a single screen using the highly available stacking architecture for high-density aggregation with seamless redundant availability. N-Series switches help provide certainty with a lifetime warranty that covers software upgrades, hardware repair or replacement, and optics and cables purchased with the switch.

Hardware, performance and efficiency
- Up to 48 line-rate GbE RJ45 ports and four integrated 10GbE SFP+ ports.
- Up to 12 PoE/PoE+ ports without an optional external power supply.
- Up to 192 1GbE ports in a 4-unit stack for high-density, high-availability in IDFs, MDFs and wiring closets.
- Non-stop forwarding and fast failover in stack configurations (24- and 48-port models only).
- Energy-Efficient Ethernet and lower power PHYs reduce power to inactive ports and idle links, providing energy savings from the power cord to the port.
- Fresh Air compliance for operation in environments up to 113°F (45°C) helps reduce cooling costs in temperature-constrained deployments.

Deploying, configuring and managing
- USB auto-configuration rapidly deploys the switch without setting up complex TFTP configurations or sending technical staff to remote offices.
- Management via an intuitive and familiar CLI, embedded web server (GUI), SNMP-based management console application (including Wavesys OpenManage Network Manager), Telnet or serial connection.

- Deploy, monitor and troubleshoot via integration with HiveManager cloud or on-premise management
- Private VLAN extensions and Private VLAN Edge support.
- AAA authorization, TACACS+ accounting and RADIUS support for comprehensive secure access support.
- Authentication tiering allows network administrators to tier port authentication methods such as 802.1x, MAC Authentication

- Bypass and Captive Portal in priority order so that a single port can provide flexible access and security.
- Remote Switch Port Analyzer (RSPAN) monitors ports across a Layer 2 domain without costly dedicated network taps.

Product	Description
WNC-1100 series	WNC-1108T-ON: 8x 10/100/1000Mbps half/full duplex RJ45 ports, 2x GbE RJ45 and 2x GbE SFP interfaces, 1 RU half-width form factor, fanless operation WNC-1108EP-ON: 8x 10/100/1000Mbps half/full duplex ports, 2x GbE RJ45 and 2x GbE SFP interfaces, 8xPoE/PoE+, 137W PoE power budget RJ45, FastPoE, Perpetual PoE,1 RU half-width WNC-1124T-ON: 24x 10/100/1000Mbps half/full duplex RJ45 ports, 4x SFP/SFP+ 1/10GbE ports, 1 RU switch form factor, fanless operation WNC-1124P-ON: 24x 10/100/1000Mbps half/full duplex ports, 4x SFP/SFP+ 1/10GbE ports, 12xPoE/PoE+ ports 190W PoE power budget, 1 RU switch form factor WNC-1148T-ON: 48x 10/100/1000Mbps half/full duplex RJ45 ports, 4x SFP+ 10GbE ports, 1 RU, fanless rWNC-1148P-ON: 48x 10/100/1000Mbps half/full duplex ports, 4x SFP/SFP+ 1/10GbE ports, 24xPoE/ PoE+, 375W PoE power budget, 1 RU switch form factor
Power cords	C13 to NEMA 5-15, 3M C13 to C14, 2M C15 to NEMA 5-15, 2M (C15 for PoE N-Series only)
Optics (optional)	Transceiver, SFP, 1000BASE-T Transceiver, SFP, 1000BASE-SX, 850nm wavelength, up to 550m reach Transceiver, SFP, 1000BASE-LX, 1310nm wavelength, up to 10km reach Transceiver, SFP, 1000BASE-ZX, 1550nm wavelength, up to 80km reach Transceiver, SFP+, 10GbE, SR, 850nm wavelength, up to 300m reach Transceiver, SFP+, 10GbE, LR, 1310nm wavelength, up to 10km reach Transceiver, SFP+, 10GbE, ER, 1550nm wavelength, up to 40km reach
Cables (optional)	Wavesys Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct

Technical specifications

Physical
4x integrated front 10GbE SFP+ dedicated ports, 2x 10GbE can be used as stacking ports (24 and 48-port models), 2x 1GbE SFP links (8-port models)

USB (Type A) port for configuration via USB flash drive
Auto-negotiation for speed and flow control
Auto MDI/MDIX, port mirroring
Flow-based port mirroring
Broadcast storm control
Energy-Efficient Ethernet per port settings
Redundant variable speed fans
Air flow: I/O to power supply; Pass through POE (WNC-1108EP-ON)
External power adapter: 137W of POE power (WNC-1108EP-ON)
Integrated power supply: 24W AC WNC-1108T-ON);40W AC (WNC-1124T-ON); 250W AC (WNC-1124P-ON); 60W AC (WNC-1148T-ON); 500W AC (WNC-1148P-ON)

Micro USB Console port (Micro USB to USB cable included)
Dual firmware images on-board
Switching engine model: Store and forward;

Chassis
Size (H x W x D) in inches:
 WNC-1108T-ON,WNC-118EP-ON: 1.62 x 8.23 x 8.86.WNC-1124T-ON,WNC 1124P -ON, WNC-1148T-ON, N1148PON: 1.75 x 17 x 10
WNC-1108EP-ON 280W PS 1.69x3.94x7.87

Approximate weight: WNC-1108EP-ON 4lbs, 1.81kg
WNC-1108T-ON 3.54lbs, 1.61kg
WNC-1124T-ON 6.72lbs, 3.05kg WNC-1124P-ON 8.33lbs, 3.78kg WNC-1148T-ON 8.33lbs, 3.78kgWNC-1148P-ON 9.19lbs, 4.17kg

WNC-1108EP-ON 280W PowerSupply 2.0lbs, 0.91kg
Rack mounting kit with 2 mounting
    brackets, bolts and cage nuts
1RU tray to accommodate two half rack width switches (kit includes L-brackets for 800mm deep rack/ cabinet)

Environmental
Power supply efficiency: 80% or better in all operating modes
Max. thermal output (BTU/hr): 66.53 (WNC-1108EP-ON), 35.72 (WNC-1108T-ON), 65.85 (WNC-1124T-ON),
851.66 (WNC-1124P-ON), 102.98 (WNC-1148T ON),1566.15 (WNC-1148P-ON)

Power consumption max (watts)
19.51 (WNC-1108EP-ON), 10.47 (WNC-1108T-ON),19.3 (WNC-1124T-ON), 249.6 (WNC-1124P-ON), 30.18 (WNC-1148T-ON), 459 (WNC-1148P-ON)

Operating temperature:
32° to 113°F (0° to 45°C) (WNC-1108EP-ON,WNC-1108T-ON, WNC-1124T-ON, WNC-1124P-ON, WNC-1148T-ON, WNC-1148P-ON)
Operating humidity: 95%
Storage temperature: –40° to 149°F (–40° to 65°C)
Storage relative humidity: 85%
Performance
MAC addresses: 16K
 Switch fabric capacity: 24Gbps (WNC-1108T-ON and WNC-1108EP-ON), 128Gbps (WNC-1124T-ON andblocking)WNC-1124P-ON), 176Gbps WNC-1148T-ON and WNC-1148P-ON)

Forwarding rate:18Mpps WNC-1108T-ON and WNC-1108EP-ON), 96Mpps (WNC-1124T-ONand WNC-1124P-ON), 132Mpps (WNC-1148T-ON and WNC-1148P-ON)

Link aggregation: 64 LAG groups, 144 dynamic ports per stack, 8 member ports per LAGQueues per port: 8
 Line-rate Layer 2 switching: All (non-blocking)Flash memory: 1GB

Technical specifications

Packet buffer memory: 1.5MB (WNC-1108T-ON andWNC-1108EP-ON), 2MB (WNC-1124T-ON and WNC-1124PON), 4MB (WNC-1148T-ON and WNC-1148P-ON)
CPU memory: 1GB

VLANs supported: 512
Protocol-based VLANs: Supported
ARP entries: 2,048 (IPv4)/512 (IPv6)
NDP entries: 400
Access control lists (ACL): Supported
MAC and IP-based ACLs: Supported
Time-controlled ACLs: Supported
Max ACL rules (system-wide): 4K
Max configurable rules per list: 1023
Max ACL rules per interface and direction
    (IPv4/L2): 1023
Max ACL rules per interface and direction (IPv6):
    1021 ing/253 egr
Max ACL logging rules (system-wide): 128
Max number of ACLs: 100
Max VLAN interfaces with ACLs applied: 24

IEEE Compliance
802.1AB LLDP
Wavesys Voice VLAN
Wavesys ISDP (inter-operates with devices
    running CDP)
802.1D   Bridging, Spanning Tree
802.1p   Ethernet Priority (User Provisioning
    and Mapping)
Wavesys Adjustable WRR and Strict Queue
    Scheduling
802.1Q VLAN Tagging, Double VLAN Tagging,
    GVRP
802.1S   Multiple Spanning Tree (MSTP)
802.1v   Protocol-based VLANs
802.1W   Rapid Spanning Tree (RSTP)
Wavesys RSTP-Per VLAN (compatible with Cisco's
    RPVST+)

General IPv6 protocols
General IPv6 protocols are supported. For a detailed list, please contact your Wavesys representative.

Multicast
2932 IPv4 MIB   4541 IGMP v1/v2/v3
                                      Snooping and Querier
IEEE 802.1ag draft 8.1–Connectivity Fault
    Management

Quality of service
2474   DiffServ Field
2475   DiffServ Architecture
2597   Assured Fwd PHB
Wavesys L4 Trusted Mode (TCP/UDP)
Wavesys UDLD
Wavesys Flow Based QoS Services Mode
                (IPv4/IPv6)
Wavesys Port Based QoS Services Mode

Network management and security

1155   SMIv1
1157   SNMPv1
1212   Concise MIB Definitions
1213   MIB-II
1215   SNMP Traps
1286   Bridge MIB
1442   SMIv2
1451   Manager-to-Manager MIB
1492   TACACS+
1493   Managed Objects for Bridges MIB
1573   Evolution of Interfaces
1612   DNS Resolver MIB Extensions
1643   Ethernet-like MIB
1757   RMON MIB
1867   HTML/2.0 Forms with File
                Upload Extensions
1901   Community-based SNMPv2

3412   Message Processing and Dispatching
3413   SNMP Applications
3414   User-based security model
3415   View-based control model
3416   SNMPv2

3418   SNMP MIB
3577   RMON MIB
3580   802.1X with RADIUS
3737   Registry of RMOM MIB
4086   Randomness Requirements
4113   UDP MIB
4251   SSHv2 Protocol
4252   SSHv2 Authentication
4253   SSHv2 Transport
4254   SSHv2 Connection Protocol
4419   SSHv2 Transport Layer Protocol
4521   LDAP Extensions
4716   SECSH Public Key File Format
6101   SSL
Wavesys   Enterprise MIB supporting routing
                   features draft-ietfhubmib- etherif-
                   mibv3- 00.txt (Obsoletes RFC
                   2665)
Wavesys   LAG MIB Support for 802.3ad
                   Functionality
Wavesys   sflow version 1.3 draft 5
Wavesys   802.1x Monitor Mode
Wavesys   Custom Login Banners
Wavesys   Dynamic ARP Inspection
Wavesys   IP Address Filtering
Wavesys   Tiered Authentication
Wavesys   RSPAN
Wavesys   Python Scripting
Wavesys   Support Assist

Regulatory, environment and other compliance
Safety and emissions
Australia/New Zealand: ACMA RCM Class A
Canada: ICES Class A; cUL

Wavesys Spanning tree optional features: STP root guard, BPDU guard, BPDU filtering
802.1X   Network Access Control, Auto VLAN
802.2   Logical Link Control
802.3   10BASE-T
802.3ab Gigabit Ethernet (1000BASE-T)
802.3ac Frame Extensions for VLAN Tagging
802.3ad Link Aggregation with LACP
802.3ae 10 Gigabit Ethernet (10GBASE-X)
802.3af   PoE (WNC-1108EP-ON, WNC-1124P-ON, WNC-1148P-ON)

802.3at   PoE+ (WNC-1108EP-ON, WNC-1124P-ON, WNC-1148P-ON)

802.3AX LAG Load Balancing
802.3az Energy Efficient Ethernet (EEE)
802.3u   Fast Ethernet (100BASE-TX) on Management Ports
802.3x   Flow Control
802.3z   Gigabit Ethernet (1000BASE-X)
ANSI   LLDP-MED (TIA-1057)
MTU   9,216 bytes

RFC compliance and additional features
General Internet protocols
General Internet protocols are supported. For a detailed list, please contact your Wavesys representative.

General IPv4 protocols
General IPv4 protocols are supported. For a detailed list, please contact your Wavesys representative.

1907   SNMPv2 MIB
1908   Coexistence Between SNMPv1/v2
2011   IP MIB
2012   TCP MIB
2013   UDP MIB
2068   HTTP/1.1
2096   IP Forwarding Table MIB
2233   Interfaces Group using SMIv2
2246   TLS v1
2271   SNMP Framework MIB

2295   Transport Content Negotiation
2296   Remote Variant Selection

2346   AES Ciphersuites for TLS
2576   Coexistence Between SNMPv1/v2/v3
2578   SMIv2
2579   Textual Conventions for SMIv2
2580   Conformance Statements for SMIv2
2613   RMON MIB
2618   RADIUS Authentication MIB
2620   RADIUS Accounting MIB
2665   Ethernet-like Interfaces MIB

2674   Extended Bridge MIB
2737   ENTITY MIB
2818   HTTP over TLS
2819   RMON MIB (groups 1, 2, 3, 9)
2863   Interfaces MIB
2865   RADIUS
2866   RADIUS Accounting
2868   RADIUS Attributes for Tunnel Prot.
2869   RADIUS Extensions
3410   Internet Standard Mgmt. Framework
3411   SNMP Management Framework

China: CCC Class A; NAL
Europe: CE Class A
Japan: VCCI Class A
USA: FCC Class A; NRTL UL; FDA 21 CFR 1040.10 and 1040.11
Eurasia Customs Union: EAC
Germany: GS mark
Product meets and safety standards in many countries inclusive of USA, Canada, EU, Japan, China. For more country-specific regulatory information and approvals, please see your Wavesys representative.

Immunity
EN 61000-4-5: Surge

RoHS
Product meets RoHS compliance standards in many countries inclusive of USA, EU, China, and India. For more country-specific RoHS compliance information, please see your Wavesys representative.
EU WEEE
EU Battery Directive
REACH

Energy
Japan: JEL
Certifications (available or coming soon)
Available with US Trade Agreements Act (TAA) compliance.
WNC-Series products have the necessary featuresto support a PCI-compliant network topology.

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