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## PRODUCTS

## Aurora 420

- ✓ • Broadcom Trident II
- ✓ • 6 × 40G + 48 × 10G
- ✓ • Intel Atom C2558 CPU
- ✓ • ONIE Pre-loaded
- ✓ • ONL ready

Description

Specification

## Specification

MSRP	US\$4000 for Aurora 420 switch preloaded with ICOS ( <a href="https://bm-switch.com/index.php/bare-metal-switches/leaf/netberg-aurora420-10g-switch.html">https://bm-switch.com/index.php/bare-metal-switches/leaf/netberg-aurora420-10g-switch.html</a> )
Ports	48x 100M/1G/10GbE SFP+ + 6x 40GbE QSFP+ ports in 1 RU Up to 72 x 10G SFP28 ports via break-out cables 1x RJ-45 out-of-band (10/100/1000) management 1x mini-USB console (RS232) 1x USB
Front IO	Fan LED System status LED PSU1 status LED PSU2 status LED Reset button
Performance	Switching silicon: 720Gbps Broadcom Trident 2 BCM56854 Forwarding rate: 1071Mpps Latency: <700 ns (PHY-less) MAC table: Unified Forwarding Table (UFT) Packet buffer: 12MB Intel® Atom™ Processor C2558  8GB DDR3 64GB SSD

Power	<p>Up to 200W (48 SFP+ ports with DAC, 6 QSFP+ port with DAC at 100% load)  550W 1+1 RPSU 80+ Platinum  100V~240V AC / 50~60Hz  240V DC</p> <p>800W 1+1 -40V~-60V DC (<a href="https://netbergtw.com/top-support/articles/800w-48v-dc-psu-module/">https://netbergtw.com/top-support/articles/800w-48v-dc-psu-module/</a>) RPSU (option)</p>
Cooling	<p>4 N+1 redundant fans  Front-to-Back/Back-to-Front airflow</p>
Dimensions (DxWxH)	<p>1U, 410 x 440 x 44 mm  Rackmount kit (option)</p>
Environment	<p>Operating temperature: 0~45°C  Operating humidity: 20-95% maximum relative humidity (non-condensing)</p>
Warranty	<p>3 year (<a href="https://netbergtw.com/top-support/articles/service_and_warranty/">https://netbergtw.com/top-support/articles/service_and_warranty/</a>)</p>
EMC and safety	<p>FCC (<a href="https://netbergtw.com/wp-content/uploads/Files/aurora420_CER_FCC.pdf">https://netbergtw.com/wp-content/uploads/Files/aurora420_CER_FCC.pdf</a>)  CE (<a href="https://netbergtw.com/wp-content/uploads/Files/aurora420_CER_CE.pdf">https://netbergtw.com/wp-content/uploads/Files/aurora420_CER_CE.pdf</a>)  CE Declaration of Conformity (<a href="https://netbergtw.com/wp-content/uploads/Files/CE-420.pdf">https://netbergtw.com/wp-content/uploads/Files/CE-420.pdf</a>)  Reduction of Hazardous Substances (RoHS) 6 (<a href="https://netbergtw.com/wp-content/uploads/Files/RoHS-420.pdf">https://netbergtw.com/wp-content/uploads/Files/RoHS-420.pdf</a>)</p>
Compatible NOS	<p>Open Network Linux (<a href="http://opennetlinux.org/hcl">http://opennetlinux.org/hcl</a>) with Open Network Switch Library (OpenNSL) and OF-DPA 3.0  ICOS (<a href="https://netbergtw.com/wp-content/uploads/Files/ICOS_intro.pdf">https://netbergtw.com/wp-content/uploads/Files/ICOS_intro.pdf</a>)  OpenSwitch (<a href="https://netbergtw.com/top-support/articles/openswitch-installation-guide/">https://netbergtw.com/top-support/articles/openswitch-installation-guide/</a>)  SONiC (Software for Open Networking in the Cloud)</p>
ICOS	<p>ICOS 3.2 software (<a href="https://netbergtw.com/wp-content/uploads/Files/ICOS_x86_functional_spec.pdf">https://netbergtw.com/wp-content/uploads/Files/ICOS_x86_functional_spec.pdf</a>) stack implementation. To be updated along with the development.  Check the intro here. (<a href="https://netbergtw.com/wp-content/uploads/Files/ICOS_intro.pdf">https://netbergtw.com/wp-content/uploads/Files/ICOS_intro.pdf</a>)</p> <p>NOTE: Please check this article on VxLAN configuration and routing (<a href="https://netbergtw.com/top-support/articles/vxlan-and-vxlan-routing-configuration-guide-in-icos/">https://netbergtw.com/top-support/articles/vxlan-and-vxlan-routing-configuration-guide-in-icos/</a>).</p> <p>Layer 2 features</p> <p>L2 MAC address table: 288K</p> <p>Link aggregation:</p> <ul style="list-style-type: none"> <li>* 802.3ad with LACP</li> <li>* Cisco EtherChannel</li> <li>* Max number of group: 8</li> <li>* Unicast/Multicast traffic balance</li> <li>* Virtual Port Channel (MLAG)</li> </ul> <p>VLAN:</p> <ul style="list-style-type: none"> <li>* IEEE 802.1Q</li> </ul>

- \* Port-Based
- \* Private VLAN
- \* Voice VLAN
- \* Q-in-Q

## Spanning Tree:

- \* IEEE 802.1D
- \* IEEE 802.1w
- \* IEEE 802.1s
- \* Spanning Tree Fast Forwarding
- \* Edge port (same as Fast Forwarding)
- \* Auto Edge
- \* BPDU Filter/Guard
- \* Loop Guard
- \* TCN Guard
- \* Root Guard

## Storm Control:

- \* Broadcast
- \* Unknown Multicast
- \* DLF (Unknown Unicast)

## IGMP Snooping:

- \* IGMP Snooping v1/v2/v3
- \* IGMP v1/v2 querier support
- \* IGMP Immediate Leave
- \* MLD Snooping
- \* Jumbo frame
- \* IEEE 802.3x Flow Control

## IPv6

- \* V4/V6 dual stack
- \* ICMPv6
- \* ICMPv6 redirect
- \* IPv6 Path MTU Discovery
- \* IPv6 Neighbor Discovery
- \* Stateless Autoconfiguration
- \* Manual Configuration
- \* DHCPv6
- \* SNMP over IPv6
- \* HTTP over IPv6
- \* SSH over IPv6
- \* IPv6 Telnet support
- \* IPv6 DNS resolver
- \* IPv6 RADIUS support
- \* IPv6 TACACS+ support
- \* IPv6 Syslog support
- \* IPv6 SNMP support
- \* IPv6 TFTP support
- \* Remote IPv6 ping

## QoS features

- \* Number of priority queue: 8
- \* Scheduling:
  - \*\* WRR
  - \*\* Strict priority

- \*\* Hybrid (WRR+Strict priority)
- \* WRED-ECN
- \* CoS:
- \*\* 802.1p-based CoS
- \*\* IP TOS Precedence based CoS
- \*\* IP DSCP based CoS
- \*\* WRED based CoS
- \* DiffServ:
- \*\* 32 classes
- \*\* 13 rules per class
- \*\* No. class in policy: 64
- \*\* No. policy in class: 28
- \* Auto VoIP

#### Layer 3 Features

- \* Number of IP interfaces: 128
- \* Multinetting/CIDR
- \* /31 subnet support
- \* IP ARP
- \* Proxy ARP
- \* Local proxy ARP
- \* IRDP
- \* Static route
- \* ECMP
- \* OSPF v2/v3
- \* BGP v4/v6
- \*\* RFC4893
- \* Virtual routing and forwarding (VRF) awareness in BGP:
- \*\* BGP extended communities
- \*\* BGP route leaking
- \*\* BGP dynamic neighbors
- \* Multicast:
- \*\* Multicast groups
- \*\* IGMP v1/v2/v3
- \*\* MLD v1/v2
- \*\* DVMRP
- \*\* PIM-DM v4/v6
- \*\* PIM-SM v4/v6
- \*\* IGMP proxy
- \* VRRP
- \* Loopback
- \* Routes:
- \*\* IPv4
- \*\* IPv6
- \*\* ARP entry
- \*\* ND entries
- \*\* IP IGMP/MLD
- \*\* PIM-SM/DM v4/v6
- \*\* DVMRP
- \* Source IP configuration
- \* Policy-based routing (PBR)
- \* IPv6 Tunneling
- \* IPv6 Loopback
- \* DHCPv6 relay
- \* DHCPv6 server

## Security

- \* Static/Dynamic Port Security (MAC-based)
- \* 802.1x:
  - \*\* Port based
  - \*\* MAC based
  - \*\* VLAN assignment
  - \*\* Guest VLAN
  - \*\* Unauthenticated VLAN
  - \*\* QoS assignment
- \* ACL:
  - \*\* L2: MAC SA/DA, CoS, EtherType
  - \*\* L3: IPv4 SA/DA, subnet based
  - \*\* L3: IPv6 SA/DA, flow-label, DSCP
  - \*\* L4: TCP/UDP port
  - \*\* Time-based ACL
  - \*\* ACL counters
- \* RADIUS:
  - \*\* Authentication
  - \*\* Accounting
- \* TACACS+:
  - \*\* Authentication
- \* HTTPS & SSL
- \* SSH 1.5/2.0
- \* User authentication:
  - \*\* Local
  - \*\* RADIUS/TACACS+
  - \*\* AAA
- \* DoS control
- \* MAC filter
- \* IP Source Guard
- \* Dynamic ARP inspection
- \* DHCP snooping
- \* Control Plane Policy (CoPP)

## Management

- \* Standard Linux shell tools
- \* Linux application integration
- \* Industry standard CLI
- \* CLI filtering
- \* Telnet/SSH
- \* Software/configuration upload/download using TFTP/XMODEM/HTTP/FTP/SCP/SFTP
- \* SNMP v1/v2c/v3
- \* RMON 1,2,3,9 groups
- \* BOOTP client/relay
- \* DHCP:
  - \*\* Client
  - \*\* Server
  - \*\* Relay
  - \*\* L2 option 82 relay
  - \*\* L3 option 82 relay
- \* Event log
- \* DNS Client
- \* Utility: remote ping, traceroute
- \* SNTP v4
- \* LLDP: 802.1AB, 802.MED
- \* CDP

- \* UDLD
- \* Port mirroring:
  - \*\* SPAN: one-to-one, many-to-one
  - \*\* SPAN with ACL filter
  - \*\* SPAN with VLAN
  - \*\* RSPAN
- \* sFlow v5
- \* Cable test
- \* Email alerting
- \* Auto install
- \* RESTCONF interface
- \* NetSNMP

#### Data Center

- \* ONIE enabled boot loader
- \* FIP snooping
- \* Congestion Notification (CN)
- \* ETS
- \* PFC
- \* DCBX for PFC (CEE v1.0)
- \* DCBX for ETS (CEE v1.0)
- \* OpenFlow 1.3
- \* Open Ethernet Networking (OpEN) API ([http://netbergtw.com/wp-content/uploads/Files/OpEN\\_API.zip](http://netbergtw.com/wp-content/uploads/Files/OpEN_API.zip))
- \* Puppet/Chef support
- \* VXLAN
- \* NVGRE

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#### OpenSwitch

OpenSwitch Release 2.0.4 ([https://netbergtw.com/wp-content/uploads/Files/OpenSwitch\\_intro.pdf](https://netbergtw.com/wp-content/uploads/Files/OpenSwitch_intro.pdf))

#### Layer 2 features

- \*L2 MAC address table
  - \*\* 40K(\*)
  - \*\* Aging support
  - \*\* Static MAC
  - \* Reserved MAC pass through
  - \* Link Aggregation
    - \*\* 802.3ad with LACP
    - \*\* Max number of group: 64
    - \*\* Max member per group: 48
  - \*\* Unicast/Multicast traffic balance
  - \*\* LACP fallback
- \* VLAN
  - \*\* IEEE 802.1Q
  - \*\* Port-Based
  - \*\* Q-in-Q
- \* Spanning Tree
  - \*\* IEEE 802.1S
  - \*\* Edge port (same as fast forwarding)
  - \*\* BPDU Filter/Guard
  - \*\* Loop Guard
- \* Storm Control
  - \*\* Broadcast
  - \*\* Unknown Multicast

- \*\* DLF (unknown unicast)
- \* Error Disable / Recovery
- \*\* MAC flapping
- \*\* Link flapping
- \*\* Storm control
- \*\* BPDU
- \*\* UDLD
- \* LLDP
- \* UDLD
- \* 802.3x Flow control
- \* Jumbo Frame
- \* FEC

#### Layer 3 Features

- \* L3 LAG
- \* L3 loopback
- \* L3 sub-interface
- \* IP ARP
- \*\* Aging support
- \*\* Retry count
- \* Proxy ARP / Local proxy ARP
- \* Static route
- \* 48-way ECMP
- \* BGP v4/v6
- \* VRRP v2
- \* OSPF v2
- \* BFD
- \* Source IP Configuration
- \* Policy-based Routing (PBR)
- \* IP Prefix List
- \* IP Community List
- \* Route map
- \* 64-bit ALPM routing mode support

#### Security

- \* Ingress ACL
- \* RADIUS
- \* TACACS+
- \* User authentication
- \*\* Local
- \*\* RADIUS/TACACS+
- \*\* AAA

#### QoS

- \* 8 cosq per port
- \* DWRR and Strict scheduling
- \* WRED-ECN
- \* Traffic shape

#### Management

- \* Industrial standard CLI
- \* CLI filtering, pagination and interface range
- \* Text-based configuration
- \* SSH
- \* SFTP/SCP
- \* Dual Image

- \* Incremental software update
- \* SNMP v2c/v3
- \* TFTP Server
- \* DHCP Client/Server/Relay
- \* Syslog
- \* Event log
- \* Audit Logs
- \* Utility: Remote ping, traceroute
- \* Diagnostic dump
- \* Supportability
- \* Core dump
- \* NTP Client
- \* sFlow
- \* SPAN / ERSPAN
- \* Zero Touch Provisioning
- \* Ansible Support
- \* Restful API
- \* Fast/Warm reboot

#### Data Center & SDN

- \* PFC
- \* DCBX(\*\*)
- \* VxLAN/HW-VTEP
- \* OpenFlow 1.3.4 ([http://netbergtw.com/wp-content/uploads/Files/OPS\\_of\\_dpa.pdf](http://netbergtw.com/wp-content/uploads/Files/OPS_of_dpa.pdf))
- \* CORD ready

\*: table size is depended on ALPM settings

\*\*\*: It is supported in the feature firmware upgrade

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#### SONiC

- \* BGP
- \* ECMP
- \* LAG
- \* LLDP
- \* QoS - ECN
- \* QoS - RDMA
- \* Priority Flow Control
- \* WRED
- \* COS
- \* SNMP
- \* Syslog
- \* Sysdump
- \* NTP
- \* COPP
- \* DHCP Relay Agent
- \* SONiC to SONiC upgrade
- \* One Image
- \* VLAN
- \* ACL permit/deny
- \* IPv6
- \* Tunnel Decap
- \* Mirroring
- \* Post Speed Setting
- \* BGP Graceful restart helper
- \* BGP MP
- \* Fast Reload



- \* PFC WD
- \* TACACS+
- \* MAC Aging
- \* LACP Fallback
- \* MTU Setting
- \* Vlan Trunk
- \* IPv6 ACL
- \* BGP/Neighbor-down fib-accelerate
- \* Port breakout
- \* Dynamic ACL Upgrade
- \* SWSS Unit Test Framework (best effort)
- \* ConfigDB Framework
- \* Critical Resource Monitoring
- \* MAC Aging
- \* IPv6 ACL
- \* BGP/Neighbor-down fib-accelerate
- \* PFC WD
- \* gRPC
- \* Dtel support
- \* Sensor transceiver monitoring
- \* LLDP extended MIB: lldpactable, lldplocporttable, lldpmanaddrrtable, lldplocmanaddrrtable, lldplocporttable, lldpLocalSystemData
- \* Debian Kernel 4.9
- \* Warm Reboot
- \* Incremental Config (IP, LAG, Port shut/unshut)
- \* Asymmetric PFC
- \* PFC Watermark
- \* Routing Stack Graceful Restart
- \* Basic VRF and L3 VXLAN
- \* FRR as default routing stack
- \* Everflow enhancement
- \* Egress ACL bug fix and ACL CLI enhancement
- \* L3 RIF counter support
- \* PMon Refactoring
- \* BGP-EVPN support(type 5), (related HLD Fpmsyncd,Vxlanmgr,template)



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