



D10064 DATACENTER SWITCH

Product Overview

The Inventec D10064 is a high performance and programmable 100GbE Spine switch designed for Data centers, large Enterprises as well as Service Provider network deployments.

The switch can be deployed in large scale layer 2 and layer 3 networks. Virtualized, overlay and traditional Data center networks are fully supported.

Today's applications require networks to be Agile, Scalable, Flexible, Reliable, Programmable and Open.

The D10064 switch presents an open architecture with very high bandwidth and low latency design. It delivers 6.4Tbps throughput in a compact 2RU form factor. It offers 64x100GbE ports with PHY less design.

The SDN switch supports line rate L2/L3 forwarding, programmability, network virtualization, QoS and zero touch provisioning.

The D10064 offers customers a compelling choice between a high performance Quad core x86 or a very powerful Octal Core x86 CPUs based on functional and operational requirements.

Support for Open Network Ecosystems

The Inventec D10064 is an open switch that supports multiple Network Operating Systems (NOS). Today the switch ships as bare metal but can be integrated with Inventec SONiC or a third party NOS. The switch is SDN enabled and supports P4. Full ONIE support assures network operators of seamless integration into today's open network environments.

High Performance, Scalable and Flexible

The Inventec D10064 is a high performance switch allowing wire rate of 5B packets per second with a low cut-through mode latency, 22MB on-chip buffer memory and dynamic buffer management to prevent catastrophic TCP traffic scenarios. The switch offers scalability by supporting choice of high end X86 control processor with upto 16GB of fast DDR4 memory. With a PHY less design, the switch offers a low cut through latency.

Performance

- 5B Packets per Second
- 6.4 Terabits per Second Throughput
- Line Rate L2/L3 Forwarding
- 22 MB Packet Buffer
- 64x100 G QSFP28

Control Plane

- CPU Options
 - 2.0 GHz x86 Octal-Core
 - > 8 GB to 16 GB DDR4 NOTE1
 - 2.2 GHz x86 Quad-Core
 - > 8 GB DDR4
 - 1.6 GHz x86 Quad-Core
 - > 8 GB DDR4 NOTE1
- 16 MB SPI Boot Flash with backup

Scalability

- 512K MAC Entries (HW Capable)
- 1.2M IPv4 Host Routes
- 1.3M IPv4 Routes
- 4 K VLANs

High Availability

- 1 + 1 Hot-Swappable & Redundant Power Supply
- 2 x SPI Flash Supports Boot Recovery
- 3 + 1 Hot-Swappable & Redundant Fans
- 802.3ad Link Aggregation/LACP
 - 256 Ports/Channel
 - 1024 Groups per System

Flexible Storage

- 8-128 GB SSD for Mass Storage
- 1x USB Port for External Storage



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The switch is flexible and supports different cabling options as per customer needs. AOC (Active Optical Cabling) and pluggable transceiver optics of different lengths of fiber connections are supported. The port use is also flexible. Each QSFP28 100GbE port can be used as 4x25GbE and all SFP28 25GbE ports can be used in 10GbE mode.

The programmable parser allows for reconfigurability in the field and flexibility to cover a broad range of applications.

Agile, Programmable and supports Analytics

The switch supports a programmable parser with Match Action units. This allows for new protocol support. The switch supports a RESTful API interface. It allows for automatic provisioning and configuration with Puppet and Chef. Zero touch provisioning is also available.

With Openstack orchestration tool integration, the switch enables automation, configuration and provisioning of L2 and L3 services in the data center.

Switch also supports inband Analytics and Telemetry support.

Rich Feature Set

The switch has a rich L2/L3 feature set to address the increase in datacenter network deployments and distributed computing applications. For cloud networking, it includes large L2/L3 switching & forwarding capacity and supports numerous multi-pathing and tunneling technologies and datacenter features like ECMP, VXLAN and NVGRE.

These overlays allow for network agility since the network operators do not have to modify the physical switch devices in case a user VM moves from one rack to another within the datacenter.

Available and Reliable Design

The switch is datacenter optimized with power and fan redundancy. It has a backup SPI boot flash that will activate for boot recovery if primary flash is corrupted. Also, with a PHY-less switch, the overall MTBF increases with a less number of hardware components.

Applications

- Datacenter Spine Switch
- Service Provider Switch
- Large Enterprise

Programmability and Software Support

- Inventec INOS
- ONIE
- Open Source Software Provided as RPM
- Chef and Puppet Client Integration
- Zero Touch Provisioning
- Bash Shell

Layer 2

- Dynamic ARP
- VLAN
- MTU Setting
- VLAN Trunk
- Static Port Breakout
- LAG
- MAC Ageing

Layer 3

- Address Resolution Protocol (ARP)
- Routing stack Graceful Restart
- L3 MLAG
- EVPN
- IPv6 link local
- IPv6
- ECMP
- LLDP
- QoS -ECN
- QoS-RDMA
- Border Gateway Protocol (BGP), Multiprotocol Extensions for BGP-4 (MP-BGP)
- BGP Graceful restart helper
- Fast Reload
- BGP/Neighbor-down fib-accelerate
- PFC WD
- Tunnel Decap

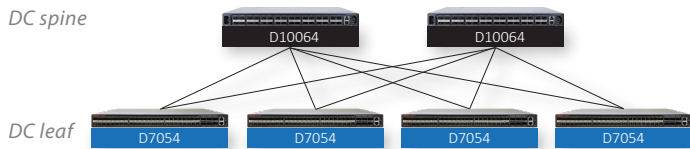


Figure 1. Inventec Switches in a Leaf-Spine DC Architecture

In Summary

Overall performance, feature-richness, high availability, programmability, port-density, and line-rate switching capability makes the D10064 an excellent choice for next generation large and medium sized datacenters. This also makes the D10064 well suited for use as a general purpose switch in large Enterprises and Service Provider networks.

QoS

- Priority Flow Control
- COS

Network Management and Monitoring

- CLI
- Telnet/SSH
- Sflow
- Mirroring
- Critical Resource Monitoring
- SONiC to SONiC upgrade ^{NOTE1}
- SNMP
- Syslog
- Sysdump
- Incremental Config
- DHCP Relay Agent
- NTP
- Sensor Transceiver Monitoring
- DHCP Relay Agent
- Multiple images support
- USB Port
- 1G Management ports

Security

- AAA (Accounting and Authorization)
- ACL Permit/Deny
- IPv6 ACL
- Dynamic ACL upgrade
- RADIUS
- TACACS+

Datacenter

- VRF
- Priority-based Flow control (802.1Qbb)
- L2 in L3 Tunneling (VxLAN/L2GRE/NVGRE)
- P4 Programming language Support

NOTE2 : The supported SONiC software features can be seen at this link below

<https://github.com/Azure/SONiC/wiki/Sonic-Roadmap-Planning>

Category	Description	Specification
Physical	Form Factor	2 RU Fixed
	Dimensions (DxWxH)	482.6 x 482.6 x 86.36 mm (19 x 19 x 3.4 inches)
	Weight	16 kg (38.72 lbs)
	Interfaces	64 x 100 GbE QSFP28
	Power Supplies	2 (1+1) Hot-Swappable & Redundant
	Power Connector	IEC320-C13
	Fans	4 (3+1) Hot-Swappable & Redundant
	System Memory	8 GB-16 GB
	Flash Storage	8-128 GB
	External I/O	1 x USB
	MGMT Port	1 x GE RJ-45
	Console Port	1 x RJ-45 (RS-232)
	Reset	1 x Reset Button (Front Panel Mounted)
	Status LEDs	System Health Status/Fan Status
Activity LEDs	Link Activity/Status	
Optics and Cables	See Section Supported Optics and Cables	
Performance and Scalability	Forwarding	5 Bpps
	Throughput	6.4 Tbps Bi-directional
	Latency	675 ns
	Layer 2	512K Mac addresses, 4K Vlans
	Layer 3	1.2M IPv4 host routes, 1.3M IPv4 LPM
	Redundancy	256 x 802.3ad groups; 128-way ECMP
	Buffer	22 MB
	Memory	8 GB
Power	Type	AC
	Input Voltage	100~240 VAC
	Input Frequency	50/60 Hz
	Typical/Max Power Draw	108 W/ 995W
Cooling	Front to Back Airflow	Yes
	Back to Front Airflow	No
Environmental	Operating Temperature	0~50 °C
	Storage Temperature	-40~70 °C
	Relative Humidity	10~90%
	Altitude	0~3000 m (0~10,000 ft)
Compliance	EMI	CISPR-22/FCC Part 15 IEC61000-3-2/3 IEC61000-4-2/3/4/5/6/11
	Safety	CB: IEC60950-1 (2nd) CCC: GB 4943.1-2011
	RoHS	RoHS-6

Supported Optics & Cables

Speed	P/N	Type	Description
100G	RTXM420-550	SR4	MPO type 70 m OM3,100m OM4
	RTXM420-551	eSR4	MPO type 210 m OM3,300m OM4
	FTLC9551REPM	SR4	MPO type
	FTLC1151RDPL	LR4	LC type 10 km SMF
	FTLC1152RGPL	CWDM4	LC type 2 km SMF
	LQ210PR-Oxxx	PSM4	MPO type 2 km
	MMA1B00-C100D	SR4	MPO type 100 m
	NDAQGF-0001	Fanout	1m fanout 25 G 30 AWG
	LOHQF004-SD-R	Fanout	3m fanout 25 G 26 AWG

ABOUT INVENTEC

Inventec Enterprise Business Group (EBG) was established in 1998 and has been focusing on the design and manufacturing of server systems. Inventec EBG is the key server system supplier of the global branding clients.

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* Standards and RFC Compliance

RFC 1112	Host extensions for IP multicasting	RFC 4271	A Border Gateway Protocol 4 (BGP-4)
RFC 1256	ICMP router discovery messages	RFC 4291	Addressing Architecture for IPv6
RFC 1321	Message digest algorithm	RFC 4443	ICMPv6
RFC 1519	CIDR	RFC 4456	BGP Route Reflectors
RFC 1765	OSPF database overflow	RFC 4486	Subcodes for BGP Cease Notification Message
RFC 1812	Requirements for IPv4 routers	RFC 4541	IGMP snooping
RFC 1981	Path MTU for IPv6	RFC 4760	Multiprotocol Extensions for BGP-4
RFC 1997	BGP Communities Attribute	RFC 5171	Unidirectional Link Detection (UDLD) Protocol
RFC 2131	DHCP relay	RFC 5340	OSPF for IPv6
RFC 2236	IGMP v2	RFC 5492	Capabilities Advertisement with BGP-4
RFC 2328	OSPFv2	RFC 6164	Using 127-Bit IPv6 Prefixes on Inter-Router Links
RFC 2365	Administratively scoped boundaries	RFC 6583	Operational Neighbor Discovery Problems
RFC 2370	The OSPF Opaque LSA Option	RFC 6860	Hiding Transit-Only networks in OSPF
RFC 2385	Protection of BGP Sessions via the TCP MD5 Signature Option	RFC 826	Ethernet ARP
RFC 2460	IPv6 Protocol Specification	RFC 894	Transmission of IP datagrams over Ethernet networks
RFC 2461	Neighbor Discovery	RFC 896	Congestion control in IP/TCP networks
RFC 2462	Stateless Autoconfiguration	RFC3810	MLDv2
RFC 2464	IPv6 over Ethernet	RFC3973	PIM-DM
RFC 2474	Definition of the differentiated services field (DS Field) in the IPv4 and IPv6 headers	RFC4601	PIM-SM
RFC 2475	An architecture for differentiated services	ANSI/TIA-1057	LLDP-MED
RFC 2545	BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing	Draft-ietf-idmr-dvmrp-v3-10	DVMRP
RFC 2597	Assured forwarding PHB group	Draft-ietf-magma-igmp-proxy-06.txt	IGMP/MLD- based multicast forwarding (IGMP/MLD proxying)
RFC 2710	MLDv1	Draft-ietf-magma-igmpv3-and-routing-05.txt	IGMPv3 and multicast routing protocol interaction
RFC 2711	IPv6 Router Alert	IEEE 802.1AB	Link level discovery protocol
RFC 2918	Route Refresh Capability for BGP-4	IEEE 802.1D	Spanning tree
RFC 3021	Using 31 -Bit Prefixes on IPv4 Point-to-Point Links	IEEE 802.1p	Ethernet priority with user provisioning and mapping
RFC 3046	DHCP/BOOTP relay	IEEE 802.1Q	Virtual LANs w/ port-based VLANs
RFC 3056	Connection of IPv6 Domains via IPv4 Clouds	IEEE 802.1s	Multiple spanning tree
RFC 3101	The OSPF "Not So Stubby Area" (NSSA) option	IEEE 802.1w	Rapid spanning tree
RFC 3137	OSPF Stub Router Advertisement	IEEE 802.1x	Port-based authentication
RFC 3246	An expedited forwarding PHB (Per-Hop Behavior)	IEEE 802.3ac	VLAN tagging
RFC 3260	New terminology and clarifications for DiffServ	IEEE 802.3ad	Link aggregation
RFC 3315	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)	IEEE 802.3x	Flow control
RFC 3376	IGMPv3		
RFC 3484	Default Address Selection for IPv6		
RFC 3493	Basic Socket Interface for IPv6		
RFC 3513	Addressing Architecture for IPv6		
RFC 3542	Advanced Sockets API for IPv6		
RFC 3587	IPv6 Global Unicast Address Format		
RFC 3623	Graceful OSPF Restart		
RFC 3633	IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6		
RFC 3736	Stateless DHCPv6		
RFC 3768	Virtual Router Redundancy Protocol(VRRP)		
RFC 4213	Basic Transition Mechanisms for IPv6		

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