SAKSHAM-3000 High-Capacity Data Centre Switch cum Router

सी-डॉट
C-DOT

Product Highlights

- Up to 25.6 Tbps system capacity
- 2RU 19" rack-mountable chassis
- 1+1 PSU redundancy
- 230V AC or -48V DC power supply option
- Hot-swappable Fans
- Front to rear cooling
- Very High Port Density: 32 x 400G QSFP-DD
- Flexible port configuration:
  - 32 x 400G
  - 64 x 200G
  - 120 x 100G
  - 120 x 50G
  - 32 x 40G
  - 120 x 25G
  - 120 x 10G
  - 32 x 1G with Adapter
- 10/100/1000 Mbps OOB Management port
- Up to 5.6 billion packets per second
- Wire speed L2 and L3 forwarding
- Low Latency cut-through switching
- IEEE 1588v2, Sync-E, NTP

Overview The proliferation of 5G technology and network virtualization necessitate the need for ultra-high capacity, low latency, and scalable data-center infrastructure. The modern data center switches targeted for such deployments should support high density ethernet ports with flexible port speed and non-blocking data processing speed.

CDOT's SAKSHAM-3000 is designed to meet the fabric switch connectivity needs of faster, higher capacity CPUs, accelerators, Smart NICs, GPUs, DPUs and flash storage constructing larger clusters in the data centre which require high bandwidth, low latency, large radix networks to achieve optimal performance. SAKSHAM-3000 is a 25.6 Tbps data center switch cum router in a compact footprint of 19-inch 2RU design which is built to address the requirements of such large data center operators.

SAKSHAM-3000 has 32 ports of 400G and it delivers carrier-class Ethernet, IP and MPLS capabilities in a cost-effective manner. Additionally, flexibility of supporting different port configuration such as 1, 10, 25, 40, 50, 100, 200 or 400 Gbps makes it a good fit for applications like Large Enterprise, Aggregation and Core network for carrying voice, data, and video traffic through the network. Owing to wide range of port speed, low latency, very high throughput and wide feature capabilities, this product is well suited for data center transition from 1/10/25/100 GbE towards 50/100/200/400 GbE port speeds can be deployed as a leaf, spine or super-spine node in a CLOS network commonly used in a Data Centre.

Hardware Features SAKSHAM-3000 is powered by high performance hardware accelerated data path ensuring wire-speed Layer-2 and Layer-3 processing with advanced features like ACL and QoS enabled with low power consumption at all packet sizes from 64 bytes to 9K bytes and multi-core control processor capable of running the complex protocol stack. System has redundant AC/DC Power Supply units and Fan trays that are hot-swappable and field replaceable. Hardware supports both PTP and Sync-E for time sensitive applications in addition to NTP.

Software Features SAKSHAM-3000 runs on CROS (C-DOT Router Operating System) software stack that provides scalable, feature-rich, and secure software to run and manage the hardware. CROS has a modular architecture with memory protection and loosely coupled Control Plane, Data Plane and Management Plane that allows feature enhancements as the needs of the network evolve. SAKSHAM-3000 supports comprehensive Layer-2, IP and MPLS protocols for inter-operating in legacy data center environments along with newer data center features that are used to build modern leaf-spine scalable IP fabric.

Software Licensing Two types of software license options are available for SAKSHAM-3000 for supporting either upto 32 x 100G ports configuration (equivalent of CTX-2000 system) or upto 32 x 400G ports configuration (maximum system configuration).

Quality of Service SAKSHAM-3000 supports flexible traffic classification in meeting various bandwidth requirements. Policing and Shaping can be used to rate limit the traffic as per requirement. Additionally, scheduling disciplines like Strict Priority, Weighted Round Robin (WRR) and congestion avoidance techniques like WRED are supported.

Management SAKSHAM-3000 can be managed locally using the console port or remotely using secure access. Access to the switch can be managed by industry standard CLI & SNMP interface and NETCONF/RESTCONF interface is available for integration with EMS/NMS and SDN controllers. Commands can be authorized via RADIUS/TACACS+ and all operations are authorized and logged. Extensive logging is supported which can be sent to syslog servers.

Virtualization SAKSHAM-3000 supports EVPN-VxLAN as the overlay tunneling technology which is needed for implementing a Layer-2 overlay network over a spanning-tree free IP underlay, providing support for VM workload mobility across racks and even data centers.

Security Features SAKSHAM-3000 is designed with in-built security features. Control Plane and Management Plane are decoupled from data plane and are protected by rate limiting of control packets. Authentication is supported for control protocols, management access is protected by management ACL, role-based access control is supported with RADIUS and TACACS+.

Salient Features

- ✓ Comprehensive L2, L3 and Multicast support
- ✓ Feature rich MPLS support for integrated router functionality
- ✓ Large Scale ECMP
- ✓ Indigenously designed hardware & software.
- ✓ Control, Management and Data Plane separation for fault isolation
- ✓ VRF support including Management VRF
- ✓ RADIUS/TACACS+
- ✓ IP Spoofing protection with uRPF and DHCP snooping
- ✓ ACL and PBR
- ✓ Control Plane Protocol Policing
- ✓ ZTP
- ✓ Multi-chassis LAG
- ✓ EVPN-VxLAN
- ✓ Hardware accelerated OAM/BFD
- ✓ sFlow support
- ✓ Fabric Management System for centralized monitoring and analytics
- ✓ NETConf/RESTConf support for automated provisioning

Layer 2 Features

- ✓ Spanning Tree (RSTP/MSTP)
- ✓ 4K VLAN support
- ✓ LLDP
- ✓ Link Aggregation/LACP
- ✓ Jumbo Frames (9216 Bytes)
- ✓ IGMP Snooping

Layer 3 Features

- ✓ Integrated Routing and Bridging
- ✓ IPv4/v6 Dual Stack
- ✓ Virtual Routing & Forwarding
- ✓ Static Routes
- ✓ RIP, RIP-ng
- ✓ OSPFv2, OSPFv3
- ✓ IS-IS
- ✓ BGP
- ✓ PIM-SM, DM, SSM
- ✓ IGMP and MLD
- ✓ ECMP
- ✓ PBR
- ✓ BFD
- ✓ GRE and IP Tunnels

MPLS Features

- ✓ LDP
- ✓ RSVP-TE
- ✓ Fast Reroute
- ✓ MPLS OAM
- ✓ MPLS L3 VPN
- ✓ MPLS L2 VPN (VPWS & VPLS)

QoS Support

- ✓ DiffServ and IEEE 802.1p QoS
- ✓ L2, L3, L4 based classification
- ✓ srTCM, trTCM
- ✓ Shaping
- ✓ Strict Priority

- ✓ WRED, ECN
- ✓ 8 queues per port

High Availability

- ✓ 1+1 PSU redundancy
- ✓ VRRP
- ✓ MC-LAG
- ✓ ECMP

Network Virtualization

- ✓ EVPN/VxLAN

Management

- ✓ CLI
- ✓ SNMP (v2c/v3)
- ✓ NETCONF/RESTCONF/Yang
- ✓ Dual software image
- ✓ Remote software upgrade
- ✓ User Management (AAA)
- ✓ Syslog
- ✓ Management over both IPv4 and Ipv6

Advanced Monitoring/ Provisioning

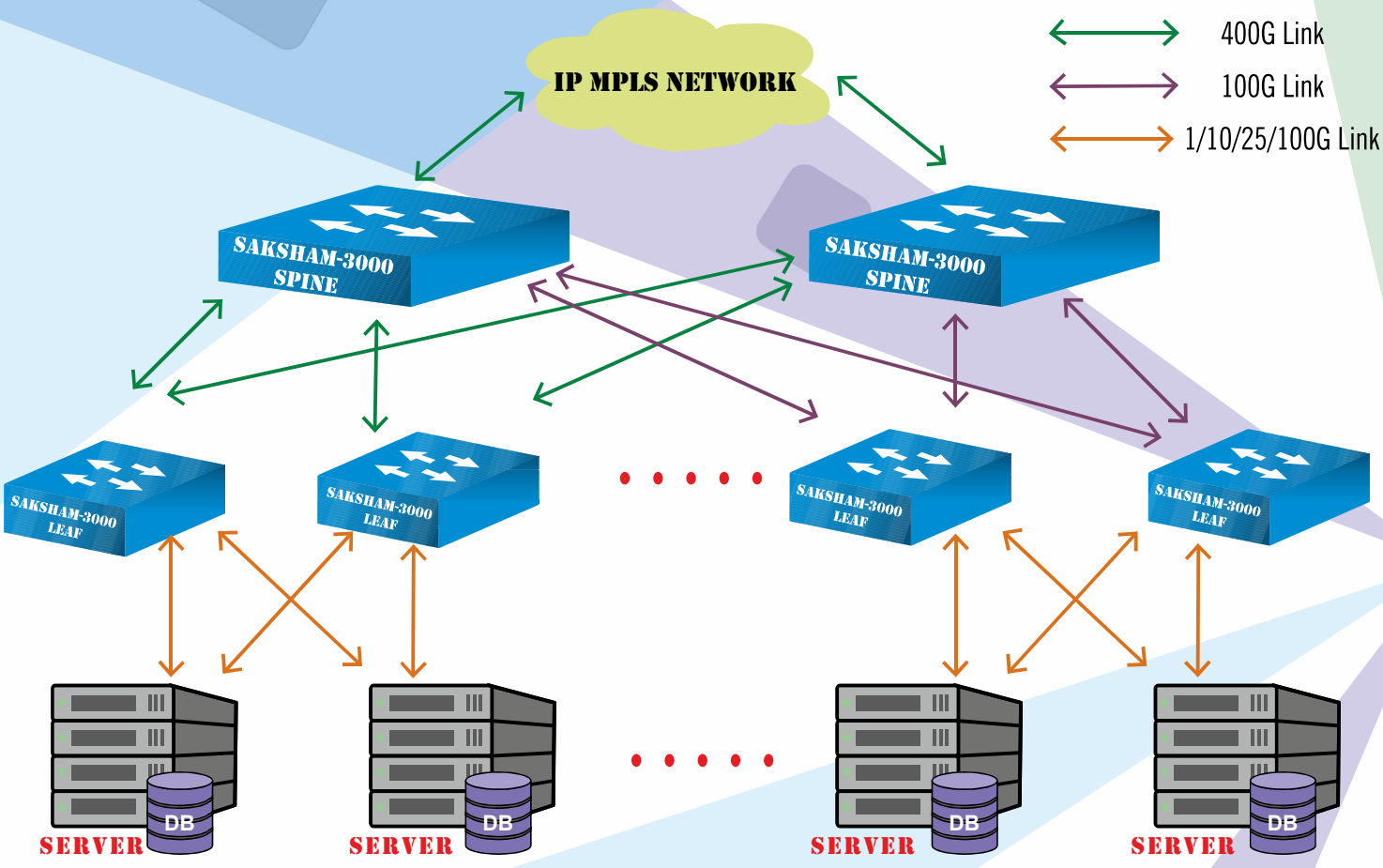
- ✓ Zero Touch Provisioning
- ✓ Port and Flow Mirroring
- ✓ RMON
- ✓ sFlow
- ✓ ERSPAN
- ✓ IP/MPLS OAM
- ✓ OAM
- ✓ Uplink Failure Detection
- ✓ IP SLA

Security Features

- ✓ Role Based Access Control
- ✓ RADIUS/TACACS+ AAA
- ✓ Secure Shell (SSH)
- ✓ Access Control List (ACL)
- ✓ Management ACL
- ✓ Management VRF
- ✓ Storm Control
- ✓ MAC limit, BPDU guard and Root guard
- ✓ Control Plane Protection
- ✓ DHCP Snooping
- ✓ Dynamic ARP Inspection
- ✓ IP Source Guard
- ✓ uRPF
- ✓ 802.1x

Timing Synchronization and others

- ✓ NTPv2
- ✓ PTP/Sync-E
- ✓ DHCP Relay
- ✓ DNS Resolver



Deployment of SAKSHAM-3000 in a Data Centre

Port Configuration	
Speed	**Port Configuration**
1GbE	32 x 1G ports using Adapter
10GbE	120 x 10G ports using 40G to 4 x 10G breakouts
25GbE	120 x 25G ports using 100G to 4 x 25G breakouts
50GbE	120 x 50G ports using 200G to 4 x 50G breakouts
40GbE	32 x 40G using 40G transceiver module
100GbE	120 x 100G ports using 400G to 4 x 100G breakouts
200GbE	64 x 200G ports using 400G to 2 x 200G breakouts
400GbE	32 x 400G using 400G transceiver module

Certification	
EMI/EMC	CISPR 32 Class A IEC 61000-4-2 IEC 61000-4-3 IEC 61000-4-4 IEC 61000-4-5 IEC 61000-4-6 IEC 61000-4-11 IEC 61000-4-29
Environmental	QM333
Safety	IS/IEC 62368-1:2018

Environmental Range	
Parameter	**Specification**
Operating Temperature	0°C to +40°C
Operating Humidity	10% - 85% non-condensing

Physical Characteristics	
Parameter	**Specifications**
Network Ports	32 x QSFP-DD
Management Ports	Console, OOB management
Power Supply	230V AC/-48V DC, 1+1 redundant, Rear FRU
Cooling	4 hot-swappable Fans, Front to Rear air-flow
Form Factor	2RU, 19" rack-mountable chassis

Ordering Information	
Model Number Options	CTX-3000-32D-AC-2U (for 230V AC power system)
	CTX-3000-32D-DC-2U (for -48V DC power system)
Software Licence Options	CTX-3000-H for 32 x 400G ports configuration
	CTX-3000-L for 32 x 100G ports configuration (equivalent of CTX-2000 system)

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