

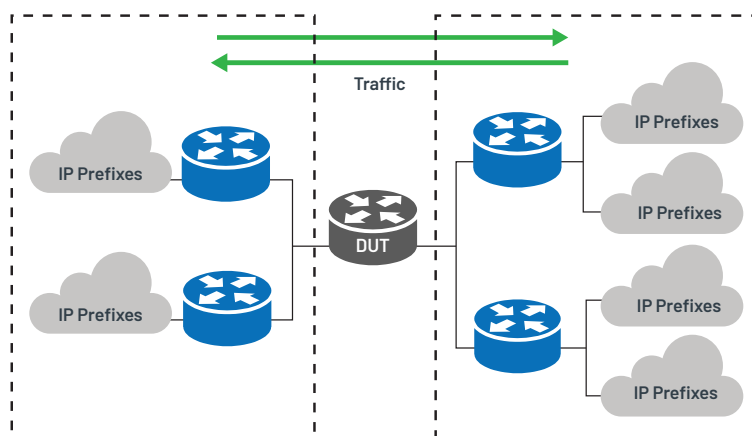
VIAVI TestCenter Routing and Switching Bundle

For AION

Application Overview

Routing and Switching Bundle for AION is a comprehensive protocol package for VIAVI TestCenter that includes unicast routing and switching technologies and enables Network Equipment Manufacturers, Service Providers and Enterprises to quickly evaluate and troubleshoot a wide range of routing functionality, performance and scalability of any routing device or network. Users expose the true performance of a router/switch by stress testing the routing software, data forwarding hardware, and the overall system architecture under both static and dynamic routing conditions.

The **Unicast Routing** protocols in this package helps users address the challenge of quickly verifying complex features and applications for enterprise, metro and core routers. This package includes emulation for IPv4 and IPv6 interior and exterior gateway routing protocols: **OSPFv2/v3, ISISv4/v6, BGP-4, BGP+, and MP-BGP**; it can emulate a variety of realistic and worst-case conditions and provide performance measurements.



Routing and Switching Validation

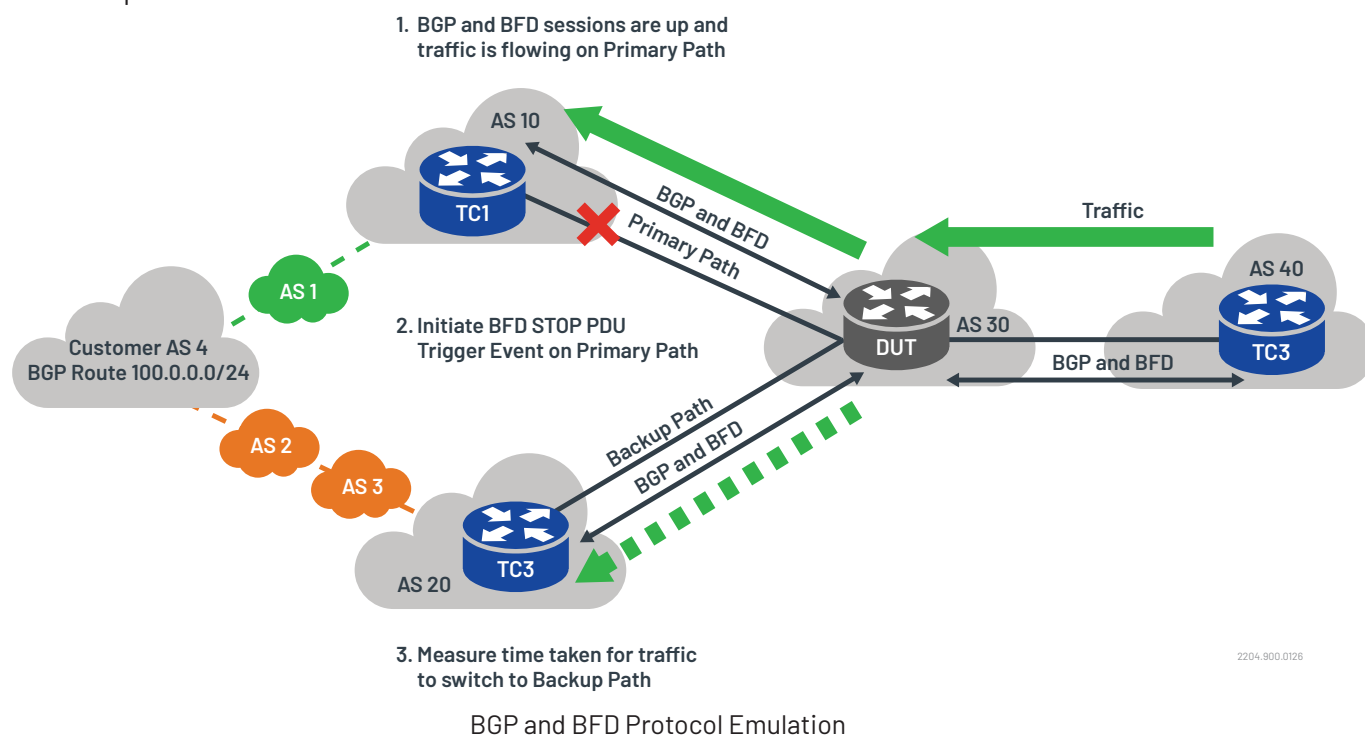
Key Use Cases and Benefits

- **Real World Network Topologies** – Emulate real world networks and evaluate key performance parameters of routers or networks under typical or extreme traffic load conditions for minutes, hours and days
- **Network/Service Reliability** – Verify scale, reliability, performance of Layer 2 and 3 services including data, multicast, and video delivered via unicast routing, multi-cast routing, and switching technologies
- **Increase Productivity** – Test and configuration wizards allow quick setup; capture functionality, protocol events and live status views make troubleshooting easy with TestCenter IQ and help save time
- **Cost-Effective Solution** – Complete routing protocol emulation suite in a single package which is also light on budget
- **Trusted Partner** – Benefit from vast testing experience with VIAVI as your guide through a world of complex testing

IGMP and **MLD** emulations in this package emulate the host side multicast group memberships and help evaluate Multicast routing protocols functionality and performance in DUT along with IPv4 and IPv6 Multicast traffic forwarding behavior.

BFD protocol emulation works with other routing/MPLS protocols to communicate link and protocol state transitions. This allows users to view protocol performance during network events such as session, route, link flap events or network over-subscription. Protocol dependent BFD configuration is automatic with single-click activation. In Control Plane Independent mode, static BFD sessions can be created independent of routing sessions for static or policy routing functional protocol testing, and protocol scale testing.

The **Convergence** test solutions for Unicast Routing and BFD, help quickly simulate various failover scenarios and validate DUT convergence behavior with measurements using data plane and control plane events as reference point.



Spanning Tree Protocol and **Multiple Spanning Tree Protocol** emulation provide functional and performance tests for Layer 2 loop prevention, load balancing and convergence.

This package is an integrated component of VIAVI TestCenter™ and works with other VIAVI TestCenter components to deliver easy, consistent TCL and Perl scripting API and Command Sequencer NoCode automation. The protocols in Routing and Switching Bundle can also be combined with Multicast Routing, MPLS/VPN, Access, or Segment Routing control-plane over routing/MPLS topology with stateful or stateless data-plane traffic.

Features and Benefits

- Support for dual-stack IPv4 and IPv6 in all routing emulation and traffic generation allows users to test the migration of routed networks from IPv4 to IPv6 under realistic deployment scenarios
- Validate scalability and protocol functionality in the same test by running multiple protocols concurrently on each port
- Quickly emulate large and complex routing topologies running broadband access protocols, Carrier Ethernet protocols, or stateful application-layer protocols from a single application interface.
- Integrated data-plane traffic enables users to send, receive, inspect, and accumulate statistics at wire-rate; users can also monitor the real time effects that router configurations have on traffic and QoS classes
- Test data-plane router convergence and network high availability features like BFD and Graceful Restart under various realistic routing failover scenarios
- Evaluate scalability and reliability of Spanning Tree and Multiple Spanning Tree designs and implementations on large-scale switching systems
- Using advanced multi-threading architecture and RouterBlock support, user can scale number of sessions or route scale with multi-dimension
- Use the Command Sequencer with TCL scripts to send SNMP commands, get SNMP data, configure the device under test, run entire test and generate pass/fail results; advanced command sequencer capabilities allow users to extend VIAVI TestCenter to meet their test needs

Technical Specifications

Parameter	Description
Unicast Routing	<ul style="list-style-type: none"> • OSPFv2, OSPFv3 for IPv4 and IPv6 testing • OSPF LSA generator to configure OSPF topologies (tree, grid, full mesh, ring, and hub and spoke) • OSPFv2 LSA Types: Router, Network, Area Summary, AS Summary, AS External, NSSA External and Opaque (TE) types 9-11 • OSPFv3 LSA Types: Router, Network, Inter- Area-Prefix, Inter-Area-Router, AS-External, Link, Intra-Area-Prefix and NSSA External • Support for DR/BDR elections on broadcast media • OSPF Graceful Restart • Simple and MD-5 authentication • Support for P2MP-TE node capabilities exchanging using Opaque LSAs
	<ul style="list-style-type: none"> • BGP-4, BGP+, and MP-BGP • Single or multi-hop Internal and External BGP router emulation • IPv4 and/or IPv6 routes, with custom prefix distributions and AS Path configurations • Interactive commands to flap (withdraw or age-out, and readvertise) routes • Route Refresh messages • Configure and send IANA specified or user-defined AFI/SAFI values • Support for 2-byte and 4-byte AS • BGP Graceful Restart with configurable timers • Pack BGP routes with common attribute into update messages to send real Internet routing tables quickly • Simple and MD-5 authentication • BGP Route Import for IPv4 and IPv6 Internet route tables
	<ul style="list-style-type: none"> • ISIS v4/v6 • ISIS LSP generator to configure ISIS topologies (tree, grid, full mesh, ring, and hub and spoke) • ISIS LSP Types: L1, L2 and L1-L2 • Support for DIS elections on broadcast media • Support Multi-topology • ISIS Graceful Restart • Simple and MD-5 authentication
	<ul style="list-style-type: none"> • RIPv1, RIPv2, RIPv6

Technical Specifications continued

Parameter	Description
Bidirectional Forwarding Detection (BFD)	<ul style="list-style-type: none"> • Control Plane Independent Session • Protocol Dependent Session • Integrated with Unicast Routing protocols and wizards <ul style="list-style-type: none"> - BGP4, MP-BGP (single and multi-hop) - OSPFv2 and OSPFv3 - ISIS - LDP and RSVP-TE - RIP, RIPv2, RIPv6 • Supports IPv4/IPv6/Dual-Stack • Multiple sessions per Router • Integrated with Graceful Restart for high availability and convergence testing • Simple and MD-5 authentication • Active/passive mode • Asynchronous or demand mode with interactive polling • Configurable timers: Transmit Interval, Receive Interval, Echo Receive Interval and Detect Multiplier • GenTX mode for high performance (3.33ms interval)
STP/RSTP/PVST +	<ul style="list-style-type: none"> • STP/RSTP/PVST+ Bridge Emulation • Bridge parameters: Bridge ID, Bridge Priority, Bridge MAC Address and Port Number • Supports Root Bridge election
IGMP/MLD Host IP Multicast	<ul style="list-style-type: none"> • IGMPv1, IGMPv2 and IGMPv3 • MLDv1 and MLDv2 • IGMP/MLD Host and Querier Emulation • Interactive IGMP/MLD report and leave messages • Include and exclude filters (for IGMPv3 and MLDv2) • Force robust join (For IGMPv1/v2 and MLDv1) • Robustness variable (for IGMPv3 and MLDv2) • Insert checksum errors for negative testing • Insert length errors for negative testing • Configurable IPv4 do not fragment (DF bit)
Multiple Spanning Tree	<ul style="list-style-type: none"> • Supports up to 64 Multiple Spanning Tree Instances (MSTIs) • MST Region setup wizard provides easy region naming and MST Instance to VLAN mapping • Bridge parameters: bridge priority, MAC address, port number, port priority, path cost and hop count • Emulates MSTI internal regional interfaces • Emulates MSTI regional boundary interfaces • MSTI/CIST regional root bridge emulation • Supports Root Bridge election
Unicast Routing Convergence Test	<ul style="list-style-type: none"> • Data Plane based Convergence Test • Advanced Control Plane based Convergence Test for BGP, OSPF, ISIS • Basic Convergence Test, Load Test and Reversion Test
BFD Convergence Test	<ul style="list-style-type: none"> • BFD Control Plane Convergence Test for BGP, OSPF, ISIS

Ordering Information

Product Number	Description
AON-PB-RTSW*	AION Routing and Switching Bundle

*Bundles are available in different number of seats, contact your VIAVI Sales Representative to find the right combination for your testing needs.

About AION

VIAVI AION is a flexible delivery platform that enables users to achieve improved deployment and provisioning for all their cloud and network testing needs. Built with your needs in mind, offering maximum flexibility in acquiring and utilizing VIAVI TestCenter platforms.

The extended platform combines a wealth of industry-leading test solutions with a flexible licensing architecture to support a wide range of next-generation solution-based domain applications.

AION offers a centralized management hub to help leverage software and hardware functionalities across all lab users and locations for a simplified management and decision-making process:

- **Flexible purchasing options** available via subscription, consumption-based, and perpetual plans, with the ability to license different bandwidth, scale, and protocol bundles.
- **Flexible deployment options** offered include cloud-delivery, on-prem, and laptop-hosted licensing services.

Enhanced user serviceability delivers always-on platform services from auto-discovery and inventory management to user and workspace administration, notifications, and log aggregation.



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