

DEDUCE: Distributed Enclave Defense Using Configurable Edges

Rapid service recovery for resilient communications



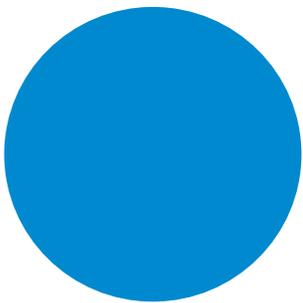
Network users expect reliable, predictable communications services. Impairments from equipment failures, network misconfiguration, severe congestion and route-convergence delays interfere with reliable service delivery. Additionally, cyberattacks may further defy rapid diagnosis and repair.

To mitigate the threat to resilient network services, Perspecta Labs has developed DEDUCE, a suite of technologies that provides network users and operators with real-time, “fight through” service restoration from the network edges. DEDUCE also provides enhanced network analytics to illuminate the nature of service disruptions and to expedite root-cause analysis, as well as support flow prioritization and deadlines. DEDUCE adopters can implement the technology within existing network elements or install it as standalone network appliances. In either scenario, DEDUCE operation is transparent to users.

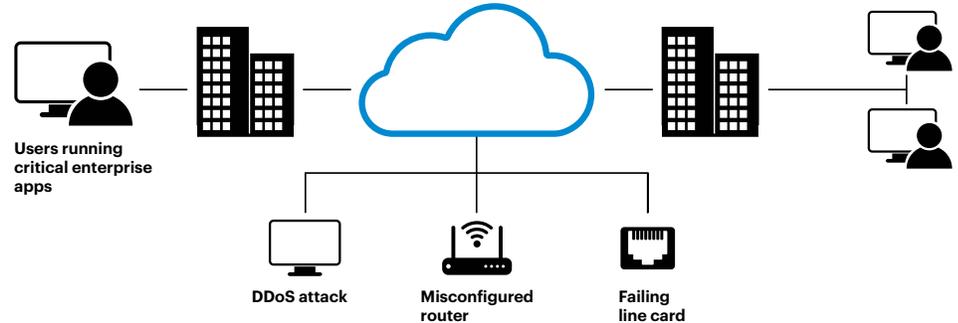
Features and benefits:

- **Adaptive transport:** Dynamically selects the most appropriate transport protocol for variable network conditions to provide the best performance for individual applications
- **Loss mitigation:** Mitigates packet loss with application-aware strategies, including loss-resistant transport protocols, packet-based error correction and routing-based avoidance

- **Path and flow analytics:** Characterizes path and flow performance according to standard metrics, including packet loss, end-to-end latency, throughput and estimated capacity
- **Priorities and rate control:** Provides per-flow bandwidth allocation to specific flows, applications or endpoints based on operational priorities
- **Deadline support:** Ensures that network applications with critical time requirements receive the necessary service required to maintain performance, even in the presence of competing traffic and adverse network conditions
- **Overlay routing:** Participating DEDUCE nodes form an overlay network capable of redirecting traffic on a per-flow basis according to application needs and network conditions; enabling efficient use of all available network resources and dynamic avoidance of emergent network problems
- **Loss characterization:** Distinguishes the type and characteristics of network loss (error, congestion or burst) to determine the most appropriate mitigation strategy
- **Application awareness:** Dynamically incorporates application requirements into selected treatments, with specific optimization for real-time streaming and transactional applications
- **Reorder:** Automatically corrects out-of-order packet delivery, seamlessly mitigating performance problems arising from re-ordering delay



DEDUCE in action



- **Situational awareness GUI:** Provides real-time network analytics, characterization and diagnostic data about flow, link and path performance to network operators
- **Holistic decisions:** DEDUCE nodes exchange status and load information, ensuring that local nodes make treatment decisions while considering the needs of the entire network
- **Multi-homing:** If multiple independent access links are available, DEDUCE can optionally provide configurable, automatic load balancing and failover across links
- **Network tomography:** Passively characterizes path and link properties to inform core network structure performance and aid in fault diagnosis
- **Route hijack detection:** Detects evidence of hijacked routes within the core network
- **Mission planning:** Permits reservation of specific network resources for known future traffic

About Perspecta Labs

At Perspecta Labs, we refuse to think inside the box. As the innovation hub of Perspecta, we are molding the future of emerging technologies. Our experts conduct leading research into cybersecurity, machine learning, artificial intelligence, mobile communications and internet of things technologies that provides customers with transformative insights and real-time situational intelligence. With our finger on the pulse of next-gen technology, you'll gain an essential edge.

Drawing on our Bell Labs and Applied Communication Sciences heritage, Perspecta Labs creates innovative technologies and services to solve the most difficult and complex information and communications challenges.

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