



allot

See. Control. Secure.

Use Cases

# Higher Education

Enterprise

## INTRODUCTION

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This document provides a selection of customer use cases applicable for the higher education sector. Each use case describes an individual challenge faced by higher education institutions along with detailed descriptions of the products available that can be used to mitigate and manage those issues.

Allot's solutions empower you to increase productivity and protect your operations and users against ransomware, Denial-of-Service attacks, and Bot infection. By delivering full visibility and granular control over applications, users, and network utilization, the Allot Secure Service Gateway (SSG) enables you to remove risky applications from your network, control recreational traffic, and most importantly, ensure that your network runs according to your business priorities. In addition, Allot's solutions will reduce the total cost of ownership of your security investment by

*Allot is a leading provider of intelligent IP service optimization solutions that help enterprises and data centers run more efficient networks that better satisfy their users.*

Allot leverages DPI technology to provide a clear and accurate view of network usage. Armed with this valuable insight, IT managers can dynamically control the delivery of critical applications to comply with SLAs, to protect network assets against attack, and to accelerate the Return on Investment (ROI) on their IT infrastructure.

Allot solutions are deployed worldwide in data centers and enterprise networks across a broad range of business sectors including e-commerce, education, energy, utilities,

finance, government, healthcare, higher education, hospitality, media and telecom, retail stores, and transportation.

The use cases in this booklet are based on the key benefits that can be obtained directly by an enterprise or through managed services providers. Each case leverages both security and network intelligence capabilities for application, user and device behavior, and control for enterprises to:

- Understand how network resources are consumed before making infrastructure investments
- Define real-time traffic management policies that align performance to business priorities and adjust IP traffic flows dynamically when links are congested
- Define tiered traffic management policies based on individual levels of service for specific user profiles
- Reduce the enterprise attack surface and increase productivity by identifying and blocking risky applications such as anonymizers and peer-to-peer applications
- Control the use of unsanctioned IT applications such as cloud storage and social media
- Increase availability with real-time DDoS protection combined with traffic management to automatically remove DDoS attack traffic within seconds while maintaining maximum Quality of Experience (QoE) for all legitimate and business-critical network services
- Detect and neutralize web threats, phishing, ransomware, quarantine botnets, and malware-infected hosts

## Key Benefits

- Permit use of personal devices to enhance employee productivity
- Ensure personal devices do not compromise a network
- Strengthen network security measures

## Bring Your Own Device in Action

- Map BYOD rules into Wi-Fi management policy
- Automatically detect traffic from personal devices
- Enforce BYOD rules in real time
- Review BYOD usage reports to evaluate and refine policy

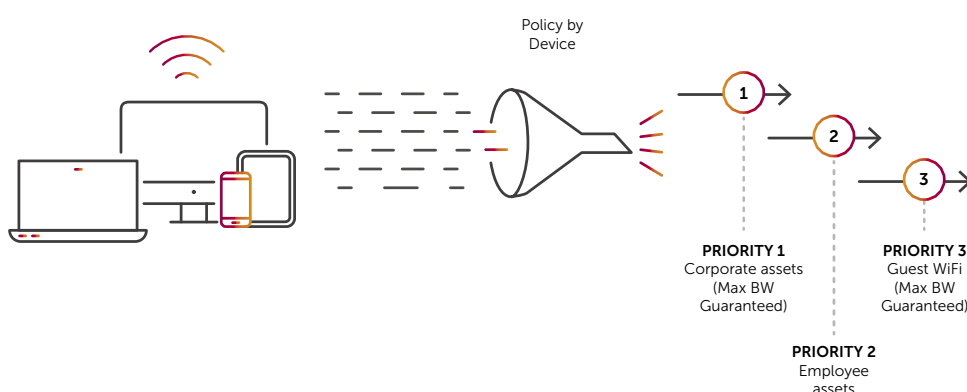
## Powered by Allot Secure Service Gateway (SSG)

- Allot Gateway Manager
- Allot ClearSee Analytics

# HIGHER EDUCATION BRING YOUR OWN DEVICE (BYOD)

While many IT managers see Bring-Your-Own-Device (BYOD) as an inevitable disruption that opens the network to security risks, users see it as a great enabler of personal productivity and efficiency. Enterprises require the ability to enforce usage rules for personal devices once they are on the network. BYOD rules may include throttling heavy usage, allocating more bandwidth to employee devices over guest devices, and giving priority to business applications. Allot's superior Deep Packet Inspection (DPI) technology provides device signatures in the same way that it provides application signatures, and it updates them regularly. This ensures timely and accurate identification of non-corporate devices and their traffic on the network.

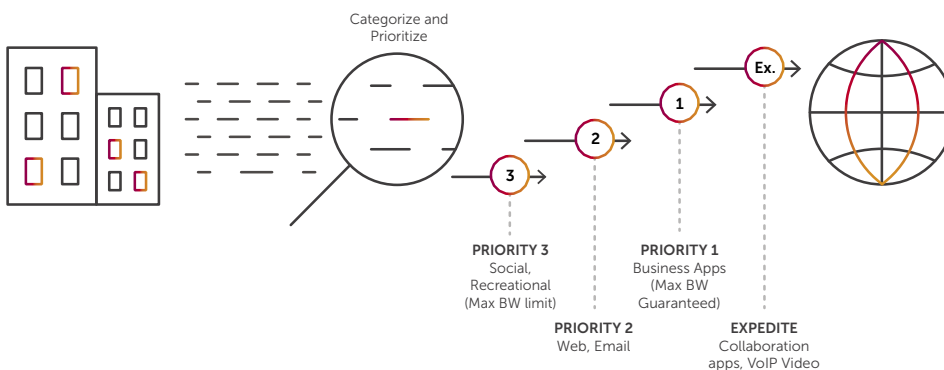
## BYOD



## HIGHER EDUCATION BUSINESS APPLICATION PRIORITIZATION

Every enterprise relies on networked applications to conduct educational activities successfully. In a connected world, computer networks serve many applications ranging from recreational to business-critical. For the educational establishment to operate efficiently, the IT team must ensure application availability and response time to all users and all access modes. Application control begins with understanding how critical applications are used, how they perform under different network conditions, and what are the factors that IT can control to ensure their delivery.

### CLOUD MIGRATION, BUSINESS APP



Based on this analysis, each application receives a tailored QoS policy, which may define congestion thresholds along with some form of expedited forwarding (depending on delay sensitivity). It may also define guaranteed minimum bandwidth or separate data rates for inbound and outbound traffic. Altogether, these parameters ensure that teaching and training processes, human resource management, and financial and legal control systems can operate more productively and with greater efficiency.

### Key Benefits

- Ensure availability and response time of critical applications
- Enhance user productivity and satisfaction
- Align network performance to business priorities
- Invest in infrastructure expansion when needed to meet educational requirements

### Business Application Prioritization in Action

- Analyze usage and performance of business applications and the Quality of Experience (QoE) that they deliver
- Define and enforce priority Quality of Service (QoS) for each application and propagate this across the network
- Enforce dynamic QoE-based congestion control aligned to educational priorities
- Troubleshoot and act upon alerts as they occur

### Powered by Allot Secure Service Gateway (SSG)

- Allot Gateway Manager
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## Key Benefits

- Guarantee the performance of education-critical applications
- Reduce time and costs involved in troubleshooting a campus network
- Avoid costly Wide Area Network (WAN) upgrades

## Campus Congestion Control in Action

- Monitor and analyze network usage
- Define fair-use policy for each campus, application, user, and time of day
- Enforce the policy based on congestion and other real-time triggers
- Troubleshoot and act upon alerts as they occur

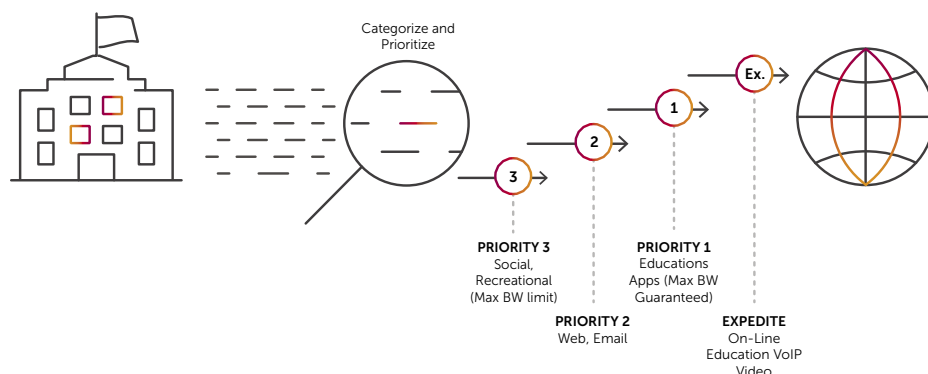
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- Allot Gateway Manager

# HIGHER EDUCATION CAMPUS CONGESTION CONTROL

Universities and colleges find themselves in the role of Internet Service Provider (ISP), delivering network and Internet services to students, faculties, administrators, and guests located on multiple campuses that are tied together in a WAN topology to a main campus hub. The ostensibly “free” and ubiquitous Internet connectivity can easily overload the campus WAN with recreational video/audio streaming, P2P downloads, social networking, and VoIP calling in addition to the demanding education applications it must support. DPI-based solutions successfully control WAN congestion by enforcing fair usage policy, which may include usage caps, limited data rates for recreational applications, assured forwarding for video lectures and remote learning, and busy-hour blocking of P2P. Campus networks have also found themselves indirect victim to DDoS attacks related to student on-line gaming activities and direct victims of malicious activity. With the combination of advanced traffic management with behavioral DDoS detection and mitigation, the SSG can protect the campus network and ensure minimal impact on education-critical applications.

## CLOUD MIGRATION, CAMPUS APP



## HIGHER EDUCATION

# INTERNET OF THINGS INTELLIGENCE

IoT devices are typically designed for a specific purpose and typically they would use a limited set of protocols and applications when communicating with their back-end servers. This enables an enterprise to reduce the attack surface of IoT deployments by applying a policy that controls access to authorized servers and limits communication patterns to expected normal behavior. In addition, the SSG provides proactive defense of your network against IoT bots such as Reaper and Mirai with in line anti-malware and anti-bot capabilities and by identifying and quarantining malware-infected devices before they adversely affect the IoT deployment, network performance and integrity. Allot security solutions monitor connection establishment rates and other symptoms of anomalous user behavior, enabling enterprises to surgically treat the root cause (that is, the malware-infected device) without having to resort to broader measures such as blocking entire subnets, links, or ports. Behavior-based anomaly detection enhances existing security layers with frontline mitigation of DDoS bots and other malware.

### ALLOT SSG FOR IOT VISIBILITY, SECURITY & CONTROL



### Key Benefits

- IoT sensor monitoring and security
- Anomaly alerts and reporting
- Prevention of bandwidth congestion and improvement of Quality of Experience (QoE) for correct sensor operation

### Internet of Things Intelligence in Action

- Apply access control and traffic policy to expected behavior of IoT deployments
- Detect anomalous behavior consistent with malware
- Identify malware (mass Domain Name Servers (DNS), spam bots, and port scanning)
- Measures sensor response time and allocates bandwidth for each sensor according to its defined operation
- Notify control services upon any anomalous activity

### Powered by Allot Secure Service Gateway (SSG)

- Allot DDoS Secure
- Network Behavior Analysis Engine

## Key Benefits

- o Accommodate a wide range of student and educator workloads
- o Align Internet access and resource allocation to educational priorities
- o Control cloud access costs

## Managing Cloud Migration in Action

- o Prioritize cloud applications and limit Internet traffic that is not education-related
- o Apply dynamic Quality-of-Experience-based congestion control
- o Enforce priorities for specific applications and/or users
- o Gain granular visibility on cloud application usage

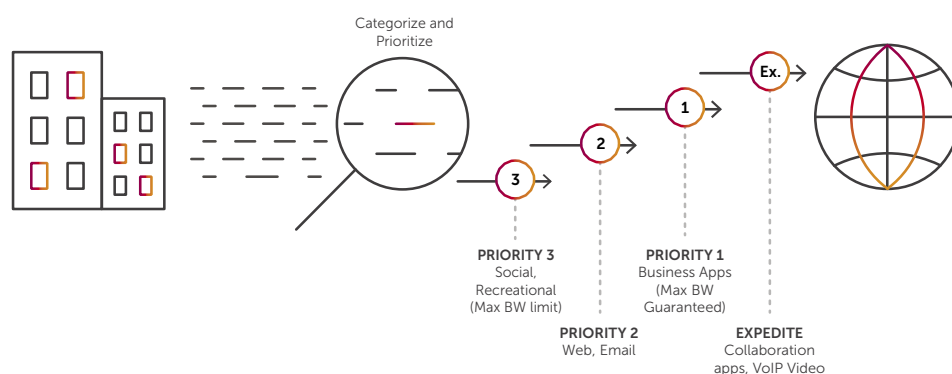
## Powered by Allot Secure Service Gateway (SSG)

- o Allot Gateway Manager
- o Allot ClearSee Analytics

## HIGHER EDUCATION MANAGING CLOUD MIGRATION

Many educational establishments are migrating applications from their private data centers to cloud-based applications. For example, exchange and collaboration servers are being replaced with Office 365 and on-premise CRM with Salesforce. The benefits of cloud migration are reduced cost, ubiquitous access, and zero maintenance and yet many companies have received bill shock from unexpected usage and struggle to maintain a high level of user Quality of Experience (QoE). DPI-based traffic management and policy control solutions enable educational organizations to monitor usage and behavior of cloud based applications and enforce priorities and committed data rates (Internet bandwidth) for educational applications over personal content. QoE-based congestion control dynamically prioritizes Internet access based on educational priorities by measuring multiple metrics and scoring the perceived QoE and end user would be receiving. With granular usage reporting, informed upgrades can be made when they are required to support the educational organization.

### CLOUD MIGRATION, BUSINESS APP

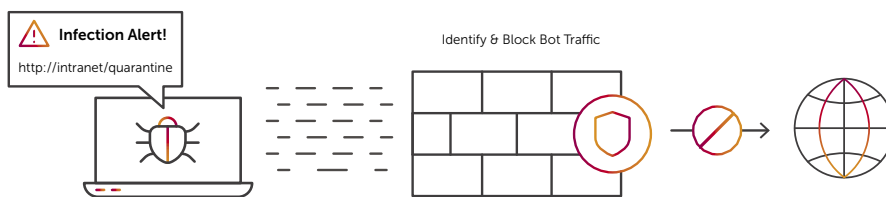


## HIGHER EDUCATION

# REAL-TIME BOT CONTAINMENT

Defend your network against malicious bots by neutralizing malware-infected hosts and spam activity before it adversely affects network performance and integrity. Prevent unintended spam and Internet Protocol (IP)- scanning traffic from eating up valuable bandwidth and quickly identify infected hosts that require cleanup. Allot security solutions monitor connection establishment rates and other symptoms of anomalous user behavior, enabling enterprises to surgically treat the root cause (that is, the malware-infected host) without having to resort to broader measures such as blocking entire subnets, links, or ports. Behavior-based anomaly detection enhances existing security layers with frontline mitigation of bots and other malware.

### INFECTION ALERT



### Key Benefits

- Protect network integrity through the rapid treatment of bot infections
- Ensure business productivity by containing infected hosts
- Reduce help-desk time spent on problems resulting from malware

### Real-time Bot Containment in Action

- Detect anomalous host behavior consistent with malware
- Identify malware through network behavior (mass-DNS, spam-bots, and port scanning)
- Block, limit, or quarantine user traffic within seconds
- Notify user and redirect to clean-up portal

### Powered by Allot Secure Service Gateway (SSG)

- Allot DDoS Secure
- Host Behavior Analysis Engine



## Key Benefits

- Protect data center availability and efficiency
- Ensure data center Service Level Agreements (SLAs) and minimize the risk of outages
- Gain visibility into attackers and their targets in your cloud

## Real-time DDoS Attack Mitigation in Action

- In-line detection and mitigation in seconds, provides immediate remediation for short-lived attacks
- Detects traffic anomaly consistent with DDoS attacks including zero-day attacks—blocked memcached amplification attacks on first instance
- Creates custom signatures to precisely filter attack packets
- Mitigation applied automatically, or upon manual verification
- System issues detailed attack report and statistics

## Powered by Allot Secure Service Gateway (SSG)

- Allot DDoS Secure
- Network Behavior Analysis Engine

# HIGHER EDUCATION REAL-TIME DDoS ATTACK MITIGATION

DDoS attacks are growing in intensity and sophistication every year such as memcached attacks and short-lived attacks that confound cloud-based DDoS mitigation solutions. Enterprise data centers are at the heart of modern day organization operation and even minutes of downtime can result in significant revenue loss. By combining advanced traffic management with behavioral Distributed Denial of Service (DDoS) detection and mitigation, zero downtime can be achieved even under attack by maintaining critical organization applications. In-line DoS/DDoS protection neutralizes flooding attacks within seconds of emergence by rapidly detecting, identifying, and filtering DDoS packets, while enabling legitimate traffic to flow unimpeded.

## DDoS PROTECTION



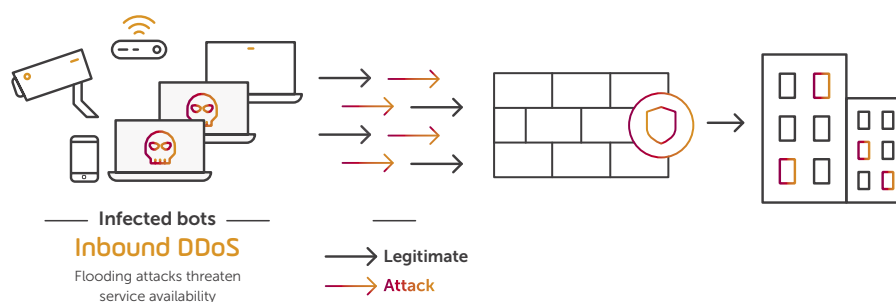
In-line detection and mitigation blocks attacks in seconds



Protect perimeter devices; Firewalls, IPs and Load Balancers



Assure service availability with dynamic congestion management and critical application prioritization





Encouragement  
of higher  
education for our  
youth is critical to  
the success of our  
collective future.

Charles B. Rangel

## Key Benefits

- Prevent Wi-Fi network congestion
- Ensure Wi-Fi service availability to all users
- Enhance customer satisfaction

## Wi-Fi Optimization in Action

- Map congestion conditions into fair usage policy rules
- Utilization threshold automatically triggers fair usage policy enforcement
- Rate-limit all users or only excessive users
- Automatically restore regular policy when congestion subsides

## Powered by Allot Secure Service Gateway (SSG)

- Allot DDoS Secure

## HIGHER EDUCATION WI-FI OPTIMIZATION

A growing number of Wi-Fi service providers include educational establishments who offer Wi-Fi service to provide Internet services to their staff and students to enhance their on-campus educational experience. This service can be easily monopolized by a few heavy users, and therefore requires fair usage management. For example, a higher education college cannot afford to allow its students to monopolize its Internet bandwidth by watching or downloading multiple high-definition videos during the study day. DPI-based solutions enable these establishments to monitor Wi-Fi utilization in real time and enforce QoS based on dynamic network conditions.

## DDoS PROTECTION



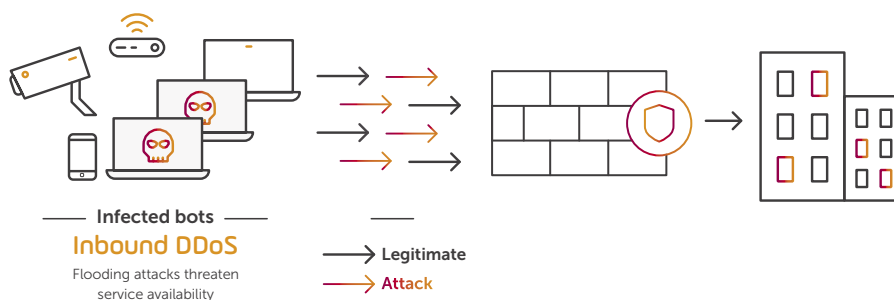
In-line detection and mitigation blocks attacks in seconds



Protect perimeter devices; Firewalls, IPs and Load Balancers



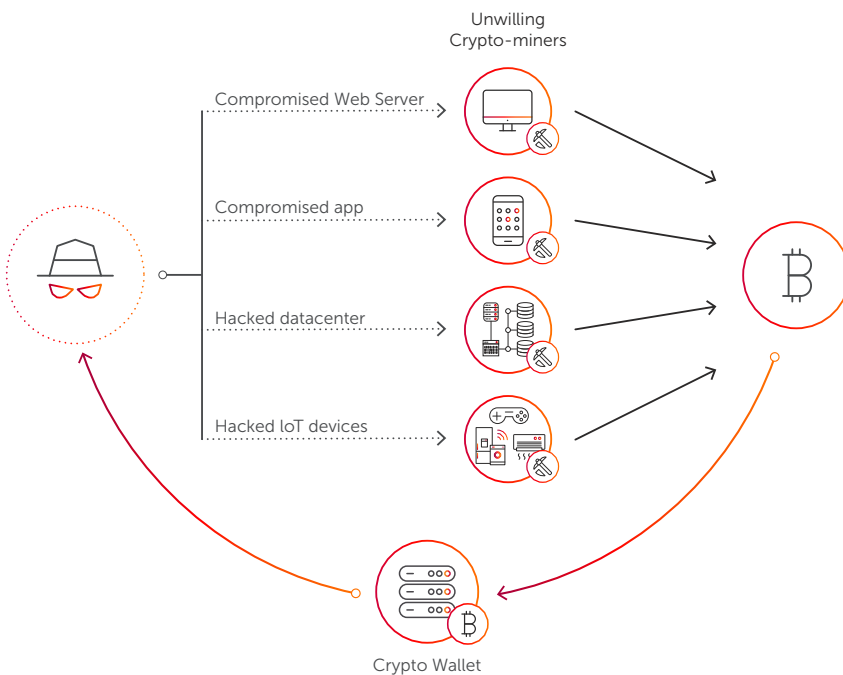
Assure service availability with dynamic congestion management and critical application prioritization



## HIGHER EDUCATION CRYPTOJACKING IDENTIFICATION AND MITIGATION

Cryptocurrency hijacking, or “cryptojacking” is one of the key threats Enterprise IT teams are facing today. Cryptomining requires massive amounts of computer processing resources, and cryptojackers are targeting CPU and GPU power located in companies and organizations as a means of mining for free. Network monitoring is certainly the best way to protect against cryptojacking. Cryptojackers must be able to communicate with their targeted servers, receive new hashes, calculate them, and return them to their own servers. Allot’s NetworkSecure and Secure Service Gateway can identify this activity and protect valuable enterprise resources from cryptojacking attacks.

### CRYPTO INFECTION ALERT



### Key Benefits

- Isolate Coinhive libraries, which mines the Monero cryptocurrency
- Broad recognition and policy enforcement of cryptomining protocols & applications
- Prevent server resources from being hijacked and impairing business application performance
- Prevent valuable networking hardware from damage through overheating, and saving electricity consumption costs associated with cryptomining

### Cryptojacking Identification and Mitigation in Action

- Identify and block Crypto malware
- Block access to web sites that inject Cryptomining software
- Identify and block Cryptomining protocols
- Identify and block P2P, VPNs, and other applications that enable Cryptojacking attacks

### Powered by Allot Secure Service Gateway (SSG)

- Allot Web Security
- Allot Visibility & Control

## FINAL WORD

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The true business of your network is business processes. Bandwidth, throughput, latency, and other common communications metrics are all aspects of evaluating how well your network supports your internal and external processes to conduct business. And sometimes it is your network that is the business.

As demonstrated in the use cases contained in this booklet, Allot SSG provides added value to operations, planning, and your business. All our customers found immediate value the minute they turned on the lights in their networks and actually saw live application, user, and network behavior. In our experience, there is often a misalignment between the way companies think their business processes are working and the way they actually work.

Processes generally underperform for the following reasons:

- The flow of applications that compose the process is broken
- The network is experiencing congestion and other traffic or equipment malfunctions
- Security-related anomalies are impairing or causing denial of service

Network visibility and control solutions can highlight all of these issues in real time and provide the tools to fix them. Your IT team will be able to identify specific protocols and applications, either encrypted or not, and monitor and measure any static or dynamic policy element that you define.

Increased visibility will also provide IT with insights into how to increase network performance. For example, seeing which employees are using what applications and when, you can prioritize access and define traffic management policies that meet your business goals and user expectations and make fully informed decisions about the size and timing of future network investment.

For more information, visit: <https://www.allot.com/enterprise>