



Enterprise Session Border Controllers (E-SBCs)

- Ingate SIParator®
- Ingate Firewall®
- Ingate Software Firewall/SIParator®

Ingate's Product Family

SIParator 21
Firewall 1210
50 Calls*



SIParator 51/56/66
Firewall 1510/1560/1660
150/400/1000 Calls*



SIParator 95/96/97
Firewall 2950/2960/2970
1800/3000/8000 Calls*



Software Firewall/SIParator
25 - 10 000 Calls*
For x86 virtual machines and
natively on supported x86 servers

* Calls = Concurrent RTP Sessions, SIP Trunks, 20 ms G.711 packets

Ingate makes it easy to connect SIP trunks to PBXs, Unified Communications (UC) solutions and call centers.

Why Ingate?

- | | | |
|------------------------------|--------------------------------|--------------------|
| • Cost-effective | • SIP normalization and repair | • Interoperability |
| • Ease of installation | • Support for remote workers | • Diagnostics |
| • Scalable 1-10,000 sessions | • Security, firewall | • SIP routing |
| • Firewall and NAT traversal | • Quality of Service (QoS) | • Proven, reliable |

In More Than 10,000 Installations Worldwide

Functions and Features

The Enterprise Session Border Controller For Your Network

The **Ingate SIParator®** is a powerful, flexible and cost-effective E-SBC for SIP connectivity, security and interoperability, such as connecting PBXs and UC solutions to SIP trunking service providers.

The **Ingate Firewall®** is an enterprise firewall that enables SIP, offering all the benefits of the Ingate SIParator in an all-in-one appliance for data security as well as the E-SBC.

The **Ingate Software Firewall/SIParator**, is a software deliverable for virtual machines and for native installation on supported hardware, allowing you to deploy Ingate's award-winning E-SBCs on your own hardware platform.

Ingate's SIP Trunking Startup Tool configures the SIParator in three easy steps.

Feature Summary of the Ingate SIParator®

SIP Security Features

- Topology hiding
- Authentication against a RADIUS server or local database
- Access control
- Intrusion Detection System, IDS/Intrusion Protection System
- Protection against:
 - Denial of Service and Distributed Denial of Service attacks
 - Malformed message attacks
 - Buffer overflow attacks
 - RTP session hijacking
 - Packet-level intrusion
 - Session hijacking and redirection
 - Vmail bombing
 - SIP spam (SPIT)

SIP Functions

- SIP proxy
- B2BUA on a per call basis
- SIP Registrar
- UDP/TLS/TLS SIP signaling in any combination
- Supports all SIP services
- PBX and ITSP interoperability
- Monitoring any SIP signaling ports
- Load balancing of SIP traffic
- DNS Override for SIP requests
- Strict SIP parser (optional, security enhancing)
- Dynamic port opening/closing, controlled by SIP proxy
- Maintains the state of all sessions and rejects all unrelated SIP packets
- Header manipulation and regular expressions
- Encryption interworking

VPN Functionality

- X.509 certificate and shared secret
- Generation of X.509 certificate for clients
- PPTP server
- IPsec (3DES, AES, NULL, MD5 and SHA1)

Firewall/Routing

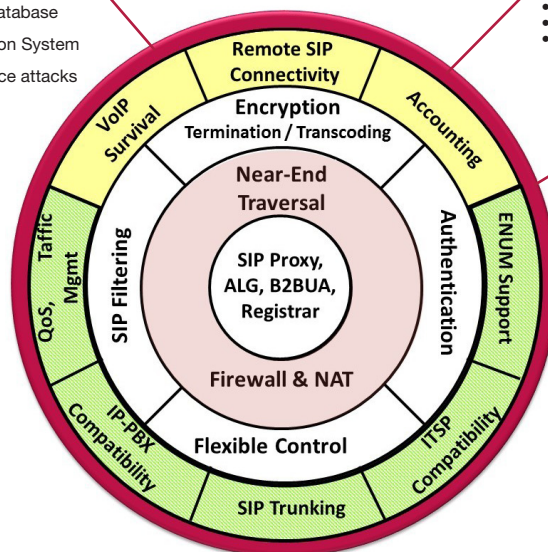
- Stateful inspection
- Packet filtering
- Provides flexible NAT and PAT
- Handles all data traffic
- Dynamic port forwarding
- Default gateway of the LAN
- DHCP proxy and server

Monitoring and Diagnostics

- SNMP V1, V2, V3
- Internal logging to HD
- Logging to PCAP file
- Syslog
- E-mail events
- Automatic check for new releases

Enhanced SIP Security

Provides signaling (TLS) and media (SRTP) encryption. Including transcoding.



Bringing Global SIP Communications to the Private Network

Ingate SIParators are enterprise session border controllers (E-SBCs) made for small to large enterprises and service providers to provide a secure solution for bringing SIP into the private network. Traditional firewalls block SIP communications. The SIParator works with existing SIP-unaware firewalls to allow and secure SIP traffic, maintaining the existing security infrastructure.

Available in a range of sizes, Ingate's security products offer unprecedented value to enterprises adopting SIP.

Ingate's award-winning SIParators also include a fully featured stateful inspection and packet filtering enterprise firewall. When the SIParator, in addition to its SIP functionality, is also used as the enterprise's main firewall, the SIParator is simply called the Ingate Firewall.

Firewall and NAT (Network Address Translation) traversal and SIP security is one of the fundamental functions of an E-SBC. SIP, like all real-time communication protocols, is blocked by firewalls, not being aware of SIP signaling and media. The SIParator's SIP proxy routes the SIP traffic and opens media ports in the built-in NAT/firewall to securely deliver calls to the protected enterprise LAN.

The SIParator connects any type of ITSP's SIP trunk, managed like MPLS or over the public Internet, and also connects home

workers and road warriors. Ingate's FENT (Far End NAT Traversal) function connects SIP phones and soft clients behind remote NAT/firewalls.

Trusted Network Security for VoIP and Unified Communications

Ingate's SIP proxy architecture grants fully secure traversal of the SIP traffic.

The SIParator's enhanced security can handle and add TLS (Transport Layer Security) for secure SIP signaling. It also supports and transcodes SRTP (Secure Real-time Transport Protocol) for encrypted voice and video. The high level of security and confidentiality further includes authentication and replay protection and other firewall means to shield users from eavesdroppers, hackers and spoofer and protect against theft of service.

SIP IDS/IPS (Intrusion Detection System/Intrusion Prevention System) works in tandem with Ingate's existing security technologies, further strengthening security for VoIP, SIP trunking, UC (Unified Communications) and other SIP applications.

Diagnostics, Troubleshooting and Monitoring

The SIParator has extensive logging and diagnostic features, to ease troubleshooting and resolve problems quickly. It can also directly generate PCAP traces, allowing more extensive analyses with WireShark and similar tools. The SIParator also has a built-in

Functions and Features

test agent that can be used to make test calls in either direction to assess MOS scores. The client can also be programmed to perform these tests on a scheduled basis.

The voice quality of calls can be monitored and reported via RADIUS, including packet loss, jitter, delay, MOS score and more.

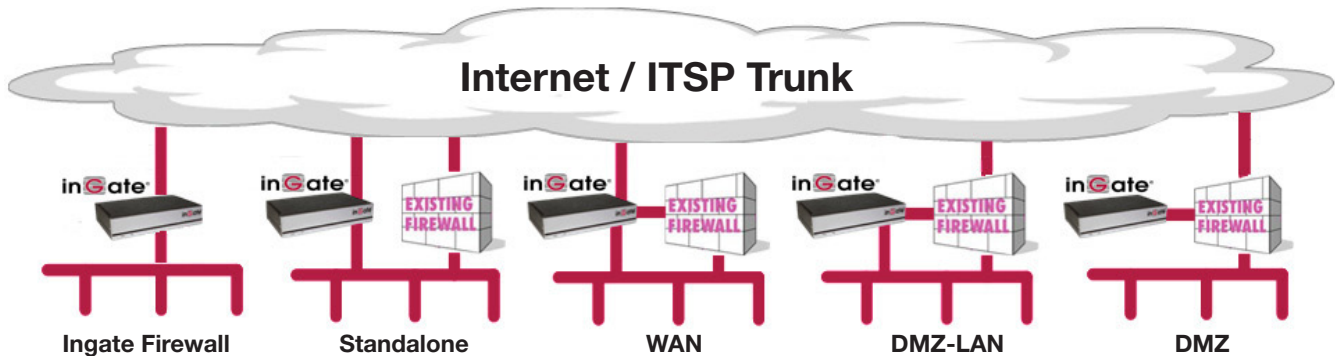
Reliability, Load Balancing and High Availability Failover

The SIParator fully supports load balancing and failover using

DNS SRV and speeds up failover by monitoring SIP servers. In addition, the SIParators can be used in failover pairs, protecting from catastrophic failure. By synchronizing configuration and long time states (like SIP registrations), the idle device takes over at the Ethernet level should the active device fail. This Ingate failover method also protects against software faults, since it directly allows dropped calls to be setup freshly again. The largest Ingate E-SBCs (S95/S96/S97) are highly protected against hardware failure, having redundant dual power supplies and RAID 1 hard disks.

Flexible Network Deployment Scenarios

The Ingate Firewall or SIParator can be implemented in various ways to fit the customer network:



QoS (voice quality over data-crowded accesses) is provided by the SIParator. DMZ-LAN & DMZ modes also require QoS setup in existing firewall.

Add-On Software Modules

SIP Trunking adds 1 – 100 trunk groups and configures the SIP trunk between IP-PBXs and SIP trunking services in three easy steps. The Back-to-Back User Agent (B2BUA) brings extensive SIP normalization for interoperability and a dial plan including support for regular expressions, header manipulation, prefix addition / removal and much more.

Remote SIP Connectivity lets remote workers leverage the benefits of Unified Communications by performing Far-End NAT Traversal (FENT) to allow home workers and road warriors to use their SIP clients behind well-behaved remote NATs and firewalls.

Quality of Service (QoS) prioritizes voice and video traffic and allocates bandwidth to assure the highest voice quality, undisturbed by data traffic. This module also enables computation and reporting of Mean Opinion Scores (MOS) and other voice quality metrics on a per call basis.

The Ingate Advantage

For enterprises, Ingate provides for a seamless transition to SIP and Unified Communications globally. Ingate enables fast, simplified deployments.

For service providers, Ingate products offer a high-quality, reliable SIP trunk demarcation point between the customer's IP-PBX and the service provider network. Placed at the customer edge, Ingate provides secure firewall traversal, interoperability, diagnostics and security to simplify SIP trunk deployments whether over a managed connection or the public Internet.

Since 2001, Ingate® Systems has been developing firewall technology to enable SIP-based communication to provide the best access for telephony, global real-time and unified person-to-person communication. Ingate offers enterprises, service providers and carriers elegant solutions for SIP trunking and trusted real-time communications beyond the LAN. Ingate products are used by retail companies, financial institutions, industrial firms, government agencies, call centers and small-to-large enterprises throughout Europe, Asia and North America.

Ingate VoIP Survival allows an enterprise using a centrex or a hosted PBX solution to fail over to the Ingate, to enable internal calls and redirect outside calls to a local PSTN gateway.

SIP Registrar makes the Ingate SIParator or Firewall the primary registrar server and permits user registrations up to the limits of the hardware platform.

Q-TURN enables WebRTC to be used with quality on secure enterprise networks. A built-in TURN server between the LAN and WAN prioritizes real-time traffic, separating it from data traffic often congesting the Internet access. It can also be used standalone as a conventional TURN server for service providers' users, and works with WebRTC and other real-time protocols using ICE/STUN/TURN. (Yet to be launched - awaiting standards finalization.)

Technical Specifications Ingate SIParator® and Ingate Firewall®

Feature	Ingate SIParator 21 Firewall 1510	Ingate SIParator 51 Firewall 1510	Ingate SIParator 56 Firewall 1560	Ingate SIParator 66 Firewall 1660	Ingate SIParator 95 Firewall 2950	Ingate SIParator 96 Firewall 2960	Ingate SIParator 97 Firewall 2970
Interfaces (10/100/1000 Mbit/s Ethernet)	4	4	4	4	6	6	6
Redundant power supply	No	No	No	No	Yes	Yes	Yes
Type of disk	Compact Flash	HDD	HDD	HDD	RAID 1	RAID 1	RAID 1
Dimension WxDxH (mm)	300x145x44	426x365x44	426x365x44	426x365x44	426x772x43	426x772x43	426x772x43
Certifications	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL
Power consumption (typical)	25W	100W	100W	100W	200W	200W	200W
Power supply 100 – 240 VAC, 50-60 Hz	External	Internal	Internal	Internal	Internal	Internal	Internal
Automatic check for new releases	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Management/Configuration options: Web GUI (HTTP, HTTPS) and CLI (SSH, serial cable)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMP, V1, V2, V3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Max number of VLANs (802.1q compliant)	16	32	64	128	512	512	512
Internal log to HD	No	Yes	Yes	Yes	Yes	Yes	Yes
Logging to PCAP file	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Syslog	Yes	Yes	Yes	Yes	Yes	Yes	Yes
E-mail events	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Support for failover multiple ISPs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Failover to secondary inactive device	Yes	Yes	Yes	Yes	Yes	Yes	Yes
External RADIUS server authentication for IPsec, GUI and SIP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unlimited data users	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Free software upgrades	Incl w Support	Incl w Support	incl w Support	Incl w Support	Incl w Support	Incl w Support	Incl w Support
Firewall functionality*							
Stateful inspection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packet filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Throughput (Mbit/s) (1500 byte packets)	200	500	700	1000	4 500	4 500	4 500
Packets per second (46 byte packets)	10 000	28 500	50 000	90 000	300 000	300 000	300 000
DHCP client and PPPoE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP server	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP proxy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proxies for TCP, UDP and FTP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flexible NAT and PAT	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPN functionality							
VPN tunnels	30	100	200	400	1600	1600	1600
3DES (168) (Mbit/s) (1438 byte packets)	20	45	55	65	130	130	130
AES (128-bit) (Mbit) (1438 byte packets)	30	60	80	85	270	270	270
X.509 certificate or shared secret	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Generating of X.509 certificates for clients	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPTP server	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPsec (3DES, AES, NULL, MD5 and SHA1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP functionality							
SIP proxy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP registrar	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP traffic to private IP addresses (NAT/PAT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP Connection set up, max calls/s	15	30	30	30	50	50	50
RTP data delay (10Mbit/s/100 Mbit/s)	0.19/0.08 ms	0.19/0.08 ms	0.19/0.08 ms	0.19/0.08 ms	0.19/0.08 ms	0.19/0.08 ms	0.19/0.08 ms
Number of concurrent calls (20 ms voice packets)	50	150	400	1000	1800	3000	8000
Secure VoIP sessions (TLS + SRTP)	50	75	150	330	900	900	900
Billing and authentication of SIP users from an external RADIUS server	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP Connect compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Security (SRTP and TLS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Add-on modules							
SIP Trunking (connecting an IP-PBX to an ITSPs SIP-trunk)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote SIP Connectivity (Far-end NAT Traversal incl STUN-server)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
QoS (bandwidth limitation and prioritization)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VoIP Survival (VoIP redundancy if Internet connection fails)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP Registrar (used as the primary SIP registrar)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* Firewall functions are hidden in the SIParators. They can be enabled by reconfiguring to the Ingate Firewall (included).

Ingate Firewall® and Ingate SIParator® are registered trademarks of Ingate Systems.



Ingate's mission is to enable the best access for telephony, global real-time and unified person-to-person communication for everyone.