inGate

Enterprise Session Border Controllers (E-SBCs)

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

Ingate's Product Family

SIParator/Firewall S95/S97/S98

4000/8000/20000 Calls maximum*

SIParator/Firewall S52

2000 Calls maximum*

SIParator/Firewall S22

800 Calls maximum*

Software SIParator/Firewall

Calls minimum: 25
Calls maximum: hardware dependent
For x86 virtual machines and for the cloud.

aws · Microsoft Azure · Google Cloud · openstack

* 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
- Ease of installation
- Scalable 1-20,000 sessions
- Firewall and NAT traversal
- SIP normalization and repair
- Support for remote workers
- Security, firewall
- Quality of Service (QoS)
- Interoperability
- Diagnostics
- SIP routing
- Proven, reliable

In More Than 10,000 Installations Worldwide

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 Unified Communications (UC) solutions to SIP trunking service providers.

The Ingate Firewall®, which is always included in the product, makes the Ingate SIParator an all-in-one appliance for data security as well as the E-SBC.

Ingate Software SIParator/Firewall is a software deliverable for virtual machines and for the cloud (Amazon Web Services, Microsoft Azure, OpenStack and Google Cloud Platform).

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

Feature Summary of the Ingate SIParator/Firewall®

SIP Security Features
- Topology hiding
- Authentication against a RADIUS server or local database
- Access control
- Intrusion Detection System / Intrusion Protection System
  o Denial of Service and Distributed Denial of Service attacks
  o Malformed message attacks
  o RTP session hijacking
  o SIP spam (SPIT)
  o Robocalling, future support of Stir & Shaken
- Signaling Encryption interworking:
  UDP/TCP/TLS/SIP over WSS/SIP over VPN
  (in any combination)

SIP Functions
- SIP proxy
- B2BUA on a per call basis
- SIP Registrar
- PBX and ITSP interoperability
- Load balancing of SIP traffic
- DNS override for SIP requests
- Strict SIP parser
- 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
- HTTP requests from Dial Plan
- IPv4, IPv6 support
- WebRTC SIP over WSS, Media DTLS-SRTP/ICE

Quality of Service (QoS)
- Classification and Prioritization
- Bandwidth limitation
- DSCP (diffserv)

VPN Functionality
- IPSec
- PPTP (server)
- Certificate/PSK(shared secret)/XAUTH(user, password)
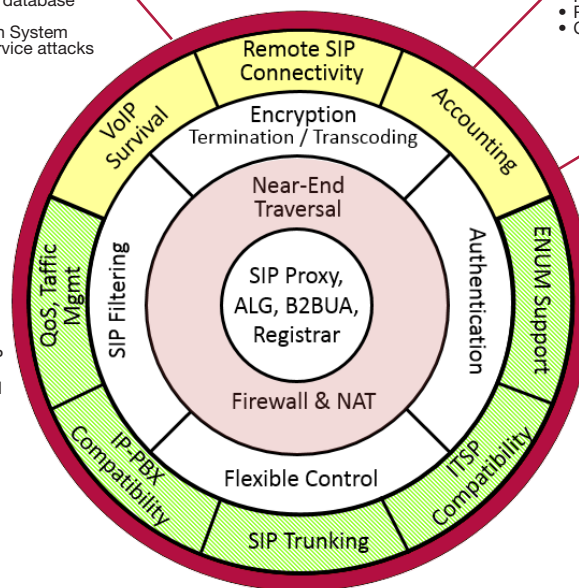
Firewall/Routing
- Stateful inspection
- Packet filtering
- Provides flexible NAT and PAT
- Dynamic port forwarding
- IPv4, IPv6 relays

Monitoring and Diagnostics
- SNMP
- Internal logging to HD
- Logging to PCAP file
- Syslog
- Automatic check for new releases
- Monitoring using SIP OPTIONS

Media
- Dynamic port opening/closing, controlled by SIP proxy
- Media Encryption interworking RTP/SRTP/DTLS-SRTP
- Transcoding between any of: PCMU, PCMA, G722 and G729A

Diagram labels: Remote SIP Connectivity · Accounting · VoIP Survival · Encryption Termination / Transcoding · Near-End Traversal · SIP Filtering · QoS Traffic Mgmt · SIP Proxy, ALG, B2BUA, Registrar · Authentication · ENUM Support · IP-PBX Compatibility · Firewall & NAT · ITSP Compatibility · Flexible Control · SIP Trunking

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. The SIParator, in addition to its SIP functionality, can also be used as the enterprise's main firewall. The built-in firewall also provides a complete and secure environment for the SIParator functions and customer services, all in one and the same product.

Firewall and NAT (Network Address Translation) traversal and SIP security are 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 NAT/firewall 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 spoofers 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 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 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/S97/S98) are highly protected against hardware failure with redundant dual power supplies and RAID 1 hard disks.

Flexible Network Deployment Scenarios

The Ingate SIParator/Firewall can be implemented in various ways to fit the customer network:
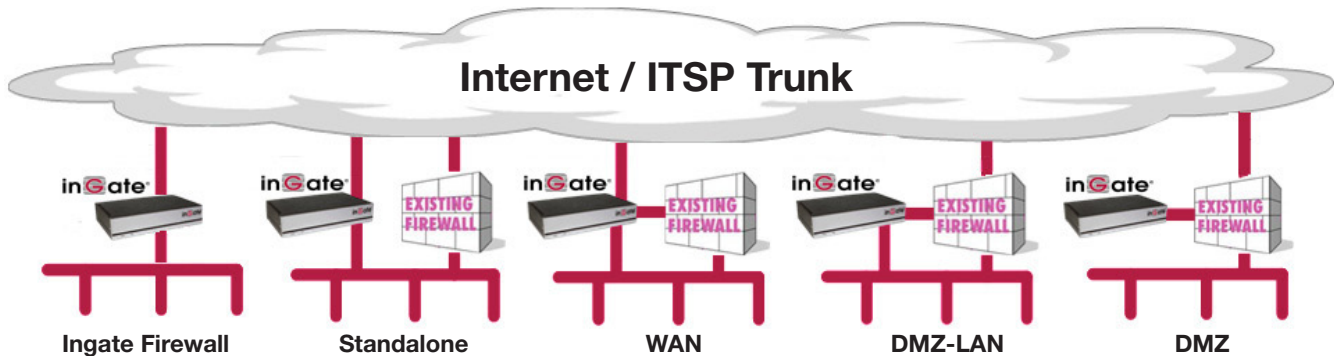
QoS (voice quality over data-crowded accesses) is provided by the SIParator. DMZ-LAN & DMZ modes also require QoS setup in existing firewall.

Software Modules and Licenses

SIP Trunking allows 1 – 100 trunk groups and configures the SIP trunk between IP-PBXs and SIP trunking services in three easy steps. Licenses for the number of concurrent calls needed over a particular trunk group are easily added. 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. One simply adds the number of Remote User SIP Session licenses needed.

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

Ingate VoIP Survival is another standard feature, allowing an enterprise using 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 user licenses make the Ingate SIParator or Firewall the primary registrar server and permits SIP clients to register.

Q-TURN session licenses enable WebRTC to be used with quality on security-restrictive enterprise networks. A built-in TURN server between the LAN and WAN allows and 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 (product not yet launched - awaiting standards finalization.)

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 network edge (locally as a CPE, at the service provider or in the cloud), 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.

Technical Specifications Ingate SIParator® / Firewall®

Feature	Ingate SIParator S22	Ingate SIParator S52	Ingate SIParator S95	Ingate SIParator S97	Ingate SIParator S98
Interfaces 10/100/1000 Mbps Ethernet, (10 Gbps DA/SFP+ optical optional)	4	6	6 (2 optional 10 Gbps)	6 (2 optional 10 Gbps)	6 (2 optional 10 Gbps)
Redundant power supply	No	No	Yes	Yes	Yes
DISK:	SATA DOM SDD	500 GB HDD	1 TB Raid 1	300 GB Raid 1	300 GB Raid 1
Dimension WxDxH	180x132x34 mm	438x292x44 mm	426x607x43 mm	426x705x43 mm	426x705x43 mm
Rack Mounting Kit	Optional tray for 2 units	Included	Sliding included	Sliding included	Sliding included
Certifications	CE, FCC, UL, CB	CE, FCC, UL, CB	CE, FCC, UL, CB	CE, FCC, UL, CB	CE, FCC, UL, CB
NEBS (Network Equipment-Building System)	No	No	No	Compliant	Compliant
Power consumption (typical)	25 W	100 W	180 W	200 W	250 W
Power supply 100 – 240 V AC, (48 V DC optional)	External	Internal	Internal	Internal (DC optional)	Internal (DC optional)
Management/Configuration options: Web GUI (HTTP, HTTPS), CLI (SSH, serial cable) and HTTP Rest API	Yes	Yes	Yes	Yes, also iDRAC port	Yes, also iDRAC port
SNMP, V1, V2, V3	Yes	Yes	Yes	Yes	Yes
VLAN Support	Yes	Yes	Yes	Yes	Yes
Internal log to HD	No	Yes	Yes	Yes	Yes
Logging to PCAP file	Yes	Yes	Yes	Yes	Yes
Syslog	Yes	Yes	Yes	Yes	Yes
Support for failover multiple ISPs	Yes	Yes	Yes	Yes	Yes
Failover to secondary incactive device	Yes	Yes	Yes	Yes	Yes
External RADIUS server authentication for IPsec, GUI and SIP	Yes	Yes	Yes	Yes	Yes
Free software upgrades, incl. with Support	Yes	Yes	Yes	Yes	Yes
Firewall functionality*					
Stateful inspection	Yes	Yes	Yes	Yes	Yes
Packet filtering	Yes	Yes	Yes	Yes	Yes
Throughput (Mbit/s) (1500 byte packets)	400	1 000	4 500	4 500	4 500
Packets per second (46 byte packets)	50 000	250 000	500 000	900 000	2 200 000
DHCP client and PPPoE	Yes	Yes	Yes	Yes	Yes
DHCP server	Yes	Yes	Yes	Yes	Yes
DHCP proxy	Yes	Yes	Yes	Yes	Yes
Proxies for TCP, UDP and FTP	Yes	Yes	Yes	Yes	Yes
Flexible NAT and PAT	Yes	Yes	Yes	Yes	Yes
VPN functionality					
VPN tunnels	100	600	1200	1 600	1 600
3DES (168) (Mbit/s) (1438 byte packets)	20	50	100	130	130
AES (128-bit) (Mbit) (1438 byte packets)	30	100	200	270	270
X.509 certificate, shared secret or XAUTH	Yes	Yes	Yes	Yes	Yes
Generating of X.509 certificates for clients	Yes	Yes	Yes	Yes	Yes
PPTP server	Yes	Yes	Yes	Yes	Yes
IPsec (IKEv1 and IKEv2)	Yes	Yes	Yes	Yes	Yes
SIP functionality					
SIP proxy	Yes	Yes	Yes	Yes	Yes
SIP registrar	Yes	Yes	Yes	Yes	Yes
SIP traffic to private IP addresses (NAT/PAT)	Yes	Yes	Yes	Yes	Yes
SIP Connection set up, max calls/s	40	60	80	100	100
RTP data delay (10Mbps/100 Mbps)	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 G.711 voice packets)	800	2000	4000	8 000	20 000
Secure VoIP sessions (TLS + SRTP)	500	1500	2500	3 000	8 000
Media Transcoding (G.722, G.729, G.711 PCMA and PCMU): Max transcoding sessions	50	100	500	600[1]	1500[1]
Billing and authentication of SIP users from an external RADIUS server	Yes	Yes	Yes	Yes	Yes
Add-on licenses					
Concurrent Calls SIP Session Licenses (CCS), multiple trunk groups	Yes	Yes	Yes	Yes	Yes
Remote User SIP Session Licenses (RUS), can be added for the number of users needed.	Yes	Yes	Yes	Yes	Yes
SIP Registrar User Licenses (SRU), can be added for the number of clients needed.	Yes	Yes	Yes	Yes	Yes

[1] Transcoding sessions are doubled if unit is equiped with two CPUs.

* The Firewall functions in the SIParator/Firewall product are hidden by default — can be reconfigured to be available.

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