

**inG**ate



**Mikael Ekman**

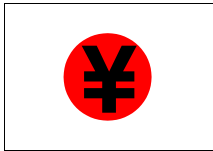
VP Sales  
Ingate Systems

# Ingate Systems

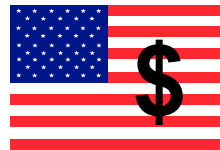
- Headquarters in Stockholm, Sweden
- North American subsidiary in New Hampshire
  - Long Island, New York
  - San Jose, California
  - Ottawa, Canada
- Leading provider of Enterprise Session Border Controllers
  - Fully SIP-capable Enterprise Firewalls
  - Enterprise SBCs (SIParator)
- Avaya DevConnect partner since 2005
- Preconfigurations for all major SIP trunking providers
- Support for remote workers
- Security and control



# Some Well Known Customers



2 Major Japanese Banks (protected under NDA)



Major Boston, MA Based Financial Services Firm (protected under NDA)



ROYAL INSTITUTE OF TECHNOLOGY



invent



# Possibilities with SIP

SIP Trunking

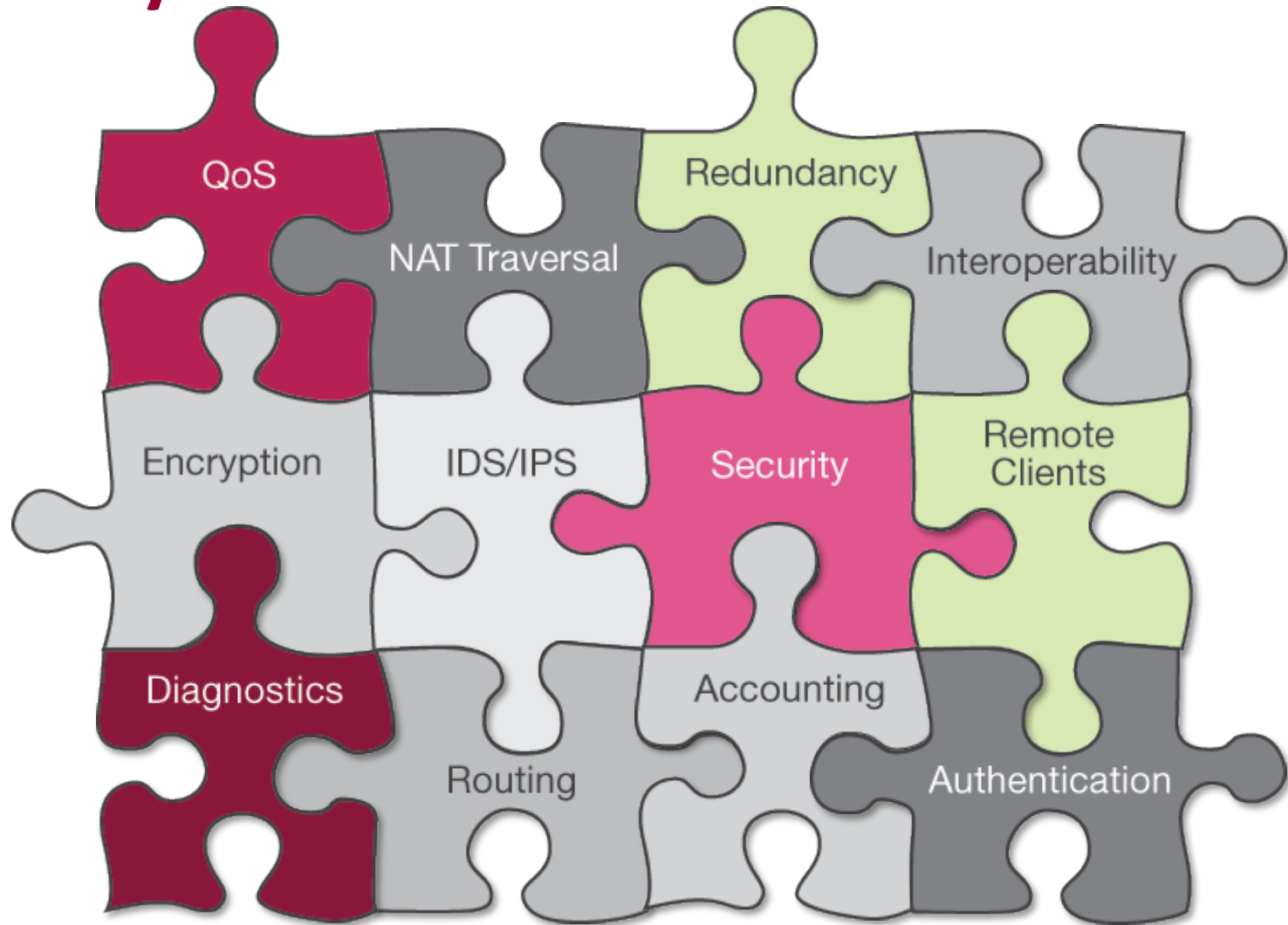
Remote Workers

Unified Communications

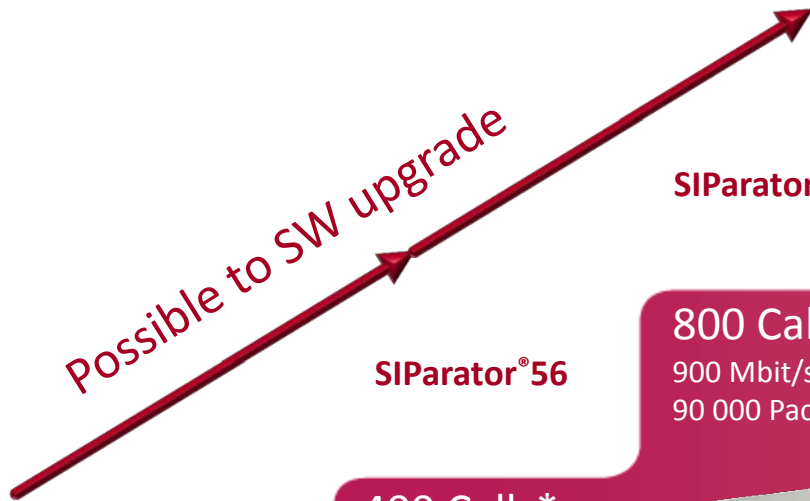
IP Centrex

SIP

# Why an SBC?



# The Ingate appliance family



**SIParator® 21**

**50 Calls\***  
200 Mbit/s  
10 000 Packets/s



**150 Calls\***  
500 Mbit/s  
28 500 Packets/s



**SIParator® 51**

**400 Calls\***  
700 Mbit/s  
50 000 Packets/s



**SIParator® 56**

**800 Calls\***  
900 Mbit/s  
90 000 Packets/s



**SIParator® 66**

**1800 Calls\***  
4 500 Mbit/s  
300 000 Packets/s



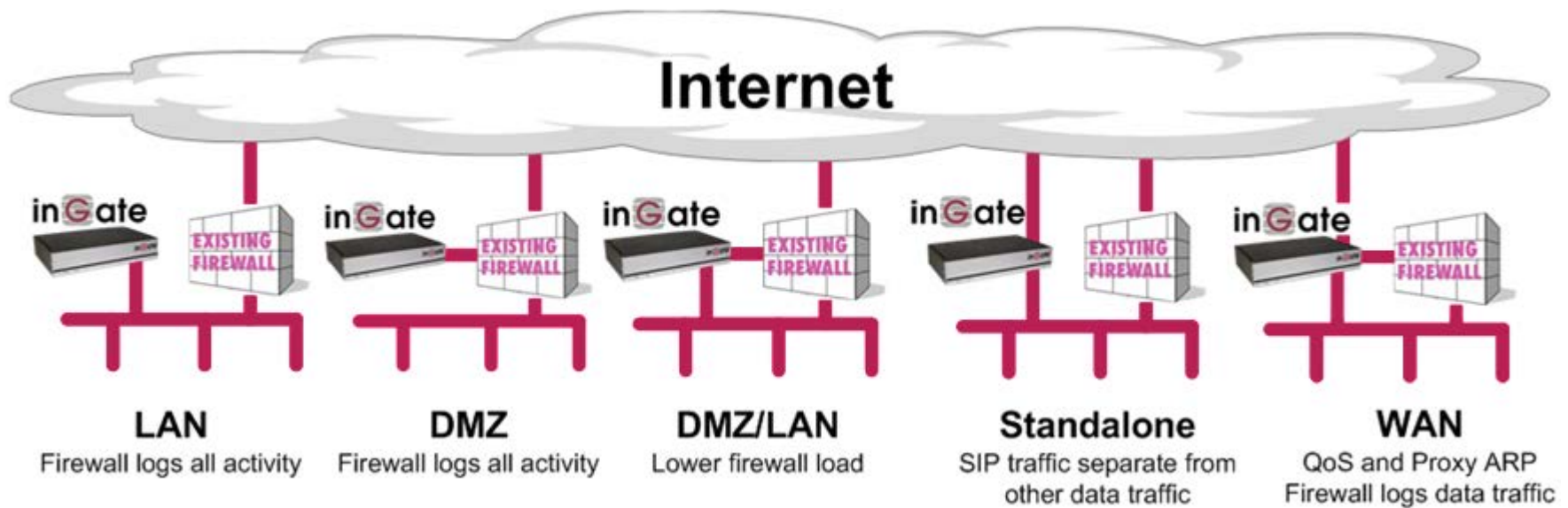
**SIParator® 95**

**3000 Calls\***  
4 500 Mbit/s  
300 000 Packets/s



\*) Calls = Concurrent RTP Sessions = SIP Trunks

# SIParator<sup>®</sup> Modes are Used Together with Existing (non SIP Aware) Firewalls\*



WAN SIParator recommended with shared data and voice IP-pipe:

- SIParator controls QoS (traffic shapes to favour voice over data)

Setup of Existing Firewall using LAN or DMZ SIParator:

- Port Forward 5060
- Port Forward Media Port range

\* Ingate can also be used as the complete combined Data and Voice Enterprise Firewall

# Ingate Licenses

Capacity licenses

Functional Modules



# Ingate modules

SIP Trunking Module

Additional Trunk Group (Pages)

Remote SIP Connectivity

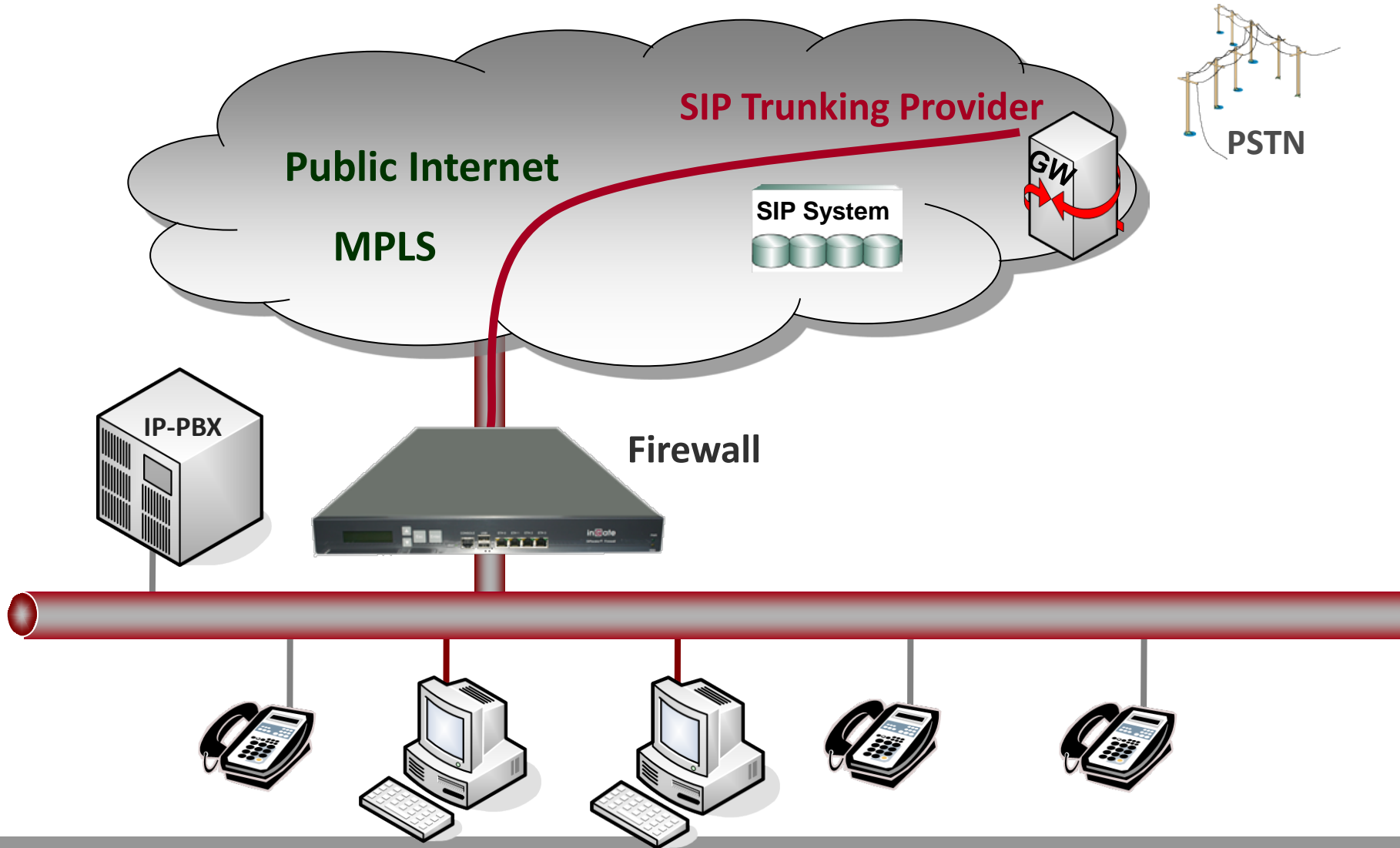
Enhanced Security Module

Quality of Service

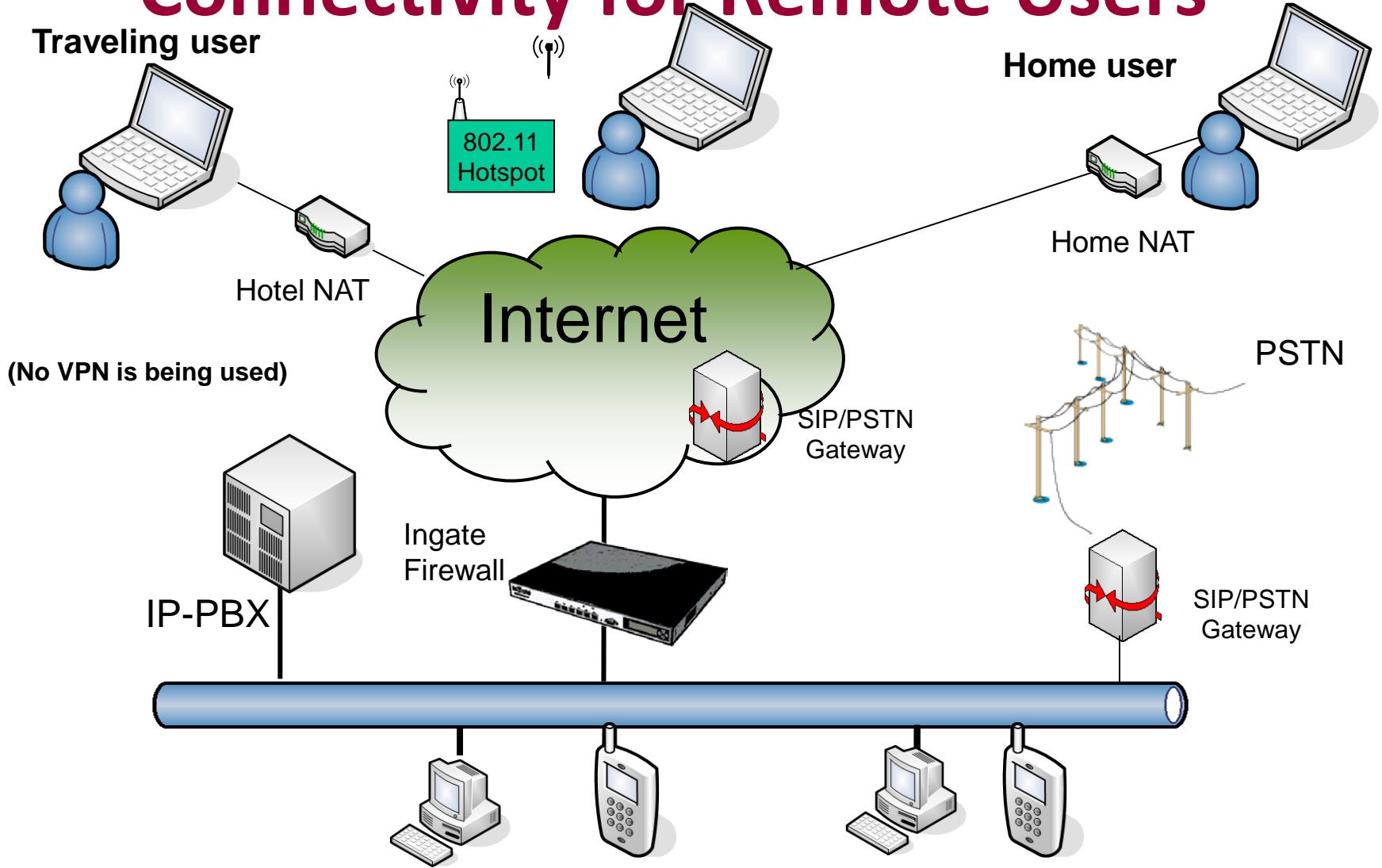
VoIP Survival Mode

SIP Registrar

# What is SIP Trunking?



# Connectivity for Remote Users



# Are you technically ready?

*IP-PBX?*



*Evaluation and Analysis*

*E-SBC?*



*Service Provider?*

# Common Deployment Issues

## Ingate Benefits - “NAT BREAKS SIP”

- Ingate have a SIP Proxy, SIP B2BUA and NAT working together
  - Ingate SIParator can bring enhance the SIP capabilities and SIP security of an existing Firewall
  - Ingate can provide “Far End NAT Traversal” functionality
- What Other IP-PBXs Vendors Do
    - Most all IP-PBX vendors recommend the use of some sort of “SIP-Aware Firewall” for deployment
    - Other recommend the use of Port Forwarding, to forward Port 5060 and a thousand other Ports to the IP-PBX – **HUGE SECURITY RISK!!**

# Common Deployment Issues

## Resolution #2 – SIP Interoperability

- Testing and Development for each Vendor
  - Extensive Testing and Development time devoted to each vendor integration to ensure complete interoperability – a huge undertaking
  - Customization and Flexibility development for each Vendor integration
- SIP Connect Compliance
  - Adherence to SIP Forum – SIP Connect Compliance, governing body of SIP Trunking deployments an standards

# Common Deployment Issues

## Ingate Benefits – SIP Interoperability

- In General,
  - Can rewrite headers commonly needing changed between vendors
  - Provide SIP Protocol error checking and fixes Protocol non-conformances
  - Routing Rules and Policies to direct traffic
  - Contains extensive list of features devoted to SIP non-conformances customization
- Ingate contains a B2BUA
  - Separates the call between the two parties, helping separate two different implementations of SIP
  - Provides Client or Server User Accounts for Registration and Authentication
  - Separate SIP Method Handling between two parties

# PBX interoperability

## Service providers

- 360 Networks
- Airespring
- AT&T
- BandTel
- Bandwidth.com
- Bell Canada
- Broadvox
- Cablevision
- Cbeyond
- Cellip
- Cordia Corporation
- Earthlink Business
- Excel Switching
- Gamma
- Global Crossing
- IP-Only
- Juma Networks
- Level 3
- Nectar
- Netlogic
- NetSolutions
- Nexvortex
- Nuvox
- One Communications
- Paetec
- Primus
- Qwest
- RNK Telecom
- Skype
- SoTel
- TDC
- Tele2
- Telia
- Toplink
- Verizon
- VoIP Unlimited
- Windstream
- Vobxone
- *More in pipeline.....*

## Carrier Equipment

- Acme Packet
- Broadsoft
- NexPoint
- Sonus
- Sylantro

**Ingate SIParator®**  
**Ingate Firewall**



S I P T R U N K

## IP-PBXs

- Aastra A-700
- Aastra Clearspan
- Aastra MX-One
- Aastra Pointspan
- Avaya
- Cisco Call Manager
- Digium/Asterisk
- Fonality
- HP
- Innovaphone
- Interactive Intelligence
- Iwatsu
- Microsoft
- Mitel
- NEC / Sphere
- Nortel
- Objectworld
- Panasonic
- Pingtel
- Samsung
- SER
- Shoretel
- Siemens

Compliant with:  
**SIPconnect**  
SIP FORUM



# Common Deployment Issues

## Common SIP Attacks

- **Intrusion of Services**
  - Devices attempting Register with a IP-PBX in an attempt to look like an IP-PBX extension and gain IP-PBX services
  - SPIT (SPAM over Internet Telephony)
- **Toll Fraud**
  - A form of an Intrusion of Service, where malicious attempts to send INVITEs to an IP-PBX to gain access to PSTN Gateways and SIP Trunking to call the PSTN
- **Denial of Service**
  - INVITE (or any SIP Request) Flood in an attempt to slow services or disrupt services
  - Or any UDP or TCP traffic directed at a SIP Service on SIP Ports
- **Indirect Security Breaches**
  - Private LAN IP Address and infrastructure are now made public, and can be used in attacks to other non-SIP areas

# Common Deployment Issues

## Resolution #3 – SIP Security

- Dynamic Encryption of SIP URI
  - Using the SIP Specification, enforce an Encrypted SIP URI where possible
- Dynamic Port Allocation
  - Dynamically change ports on every call.
- Hide LAN IP Address Scheme
  - Apply LAN to WAN Network Address Translation within the SIP Signaling
- TLS and SRTP
  - TLS Transport provides complete encryption of SIP Signaling
  - SRTP provides encryption of RTP Media
- IDS/IPS for SIP Protocol
  - SIP Protocol specific Intrusion Detection Systems and Intrusion Prevention Systems allow for monitoring and statics of all SIP Traffic, and apply rules and policies based on the traffic
- Traffic Routing Rules and Policies
  - IP Address Authentication, SIP URI Validation, and Routing Rules

# Fallback and Failover Functions

Monitor availability of SIP servers

Failure detection and reporting

SIP traffic re-route and recovery based upon

Use in parallel as failover pairs

# Other SBC SIP Features

## Accounting

- Generate CDRs
- RADIUS accounting

## Management

- Police media bandwidth per session based upon authorized codec
- Terminate inactive session with session timers
- Ensure only authorized sessions receive correct QoS and resource allocation

## Routing

- Extensive Dial Plan
- DNS (global federation)
- Least cost routing (LCR)
- ENUM-based routing
- Large local route tables for static, localized routing decisions
- Codec stripping & re-ordering

FEATURES

# Ingate Start-Up Tool

The image displays three sequential screenshots of the Ingate Start-Up Tool interface, each with a red callout box indicating a specific step in the configuration process.

- Step 1: Assign Addresses:** The first screenshot shows the 'IP-PBX' tab. Under 'Inside (Interface Eth0)', the IP address is set to 10.51.77.100 and the netmask to 255.255.255.0. Under 'Outside (Interface Eth1)', the IP address is 12.23.34.45 and the netmask is 255.255.255.248. The gateway is set to 12.23.34.41. The 'Product Type' is 'Standalone SIParator'.
- Step 2: Select IP-PBX:** The second screenshot shows the 'IP-PBX (should be located on the LAN)' section. The 'Type' is set to 'Generic PBX' and the 'IP Address' is 10.51.77.20. There are checkboxes for 'Use domain name' and 'SIP Domain'.
- Step 2: Select Service Provider:** The third screenshot shows the 'ITSP\_1' tab. The 'Name' is 'Generic ITSP'. The 'Provider address' IP is 0.0.0.0. The 'Account information' section includes fields for 'Authentication name', 'Domain', and 'Password'. There are checkboxes for 'Use account', 'Increment authentication name for ranges', and 'Use user account on incoming call'. The 'PBX local numbers (advanced)' section includes a field for 'Local number(start of range, use same as DID if local numbers are not used)' and a checkbox for 'PBX registers at the Ingate'.

Each screenshot also shows a 'Status' window at the bottom, indicating the tool is connected to the Ingate SIParator and listing system features like VoIP Survival, VPN, QoS, and Enhanced Security.

## Ingate solutions

- SIP Proxy based architecture. Aware of NATed environments and dynamically controlling built-in NAT and firewall.
- Additional Back to Back User Agent allows Ingate to mitigate any differences in the signaling
- Continues tests against PBXs and service providers
- Ingate conducts frequent formal recertification testing
- Ingate is committed to assuring its customers that the SIP signaling will be normalized

SOLUTIONS