



E911 for ShoreTel ShoreGear (SSG)

Solution Overview

ShoreTel ShoreGear (SSG) provides organizations with highly reliable IP telephony capabilities that enhance productivity and employee mobility. By implementing SSG, organizations benefit from a scalable, centralized communications system which offers a lower total cost of ownership.

Challenges

Although SSG offers a simple, cost-effective, and extremely reliable voice communication solution, it faces certain challenges in regard to emergency calling, including:

- Ensuring 911 calls and accurate location information are routed to the appropriate Public Safety Answering Point (PSAP)
- Providing E911 support for teleworkers and branch offices
- Supporting E911 for shared call appearance and extension mobility
- Compliance with state and federal E911 regulations

911 Enable provides an enterprise-wide E911 solution that responds to these challenges and is certified with SSG.

Solution Highlights

- **Simple to deploy and easy to manage**
- **Automatic IP phone tracking using layer 2 discovery**
- **Enterprise-wide solution for the entire workforce, including remote branches, work-at-home employees, and teleworkers**
- **Nationwide E911 call routing service in both the US and Canada**
- **E911 support for phones using shared call appearance and extension mobility**
- **Complies with all E911 regulations and standards**

911 Enable Solution for SSG

911 Enable provides the market's most comprehensive and reliable E911 solution for SSG. It helps ensure that 911 calls and correct location information are sent to the appropriate PSAP.

Simple to deploy and easy to manage, the solution's proven technology helps organizations fulfill all their E911 requirements and supports the entire workforce. It reduces administrative burden and ensures compliance with E911 regulations.

Solution Components

911 Enable's solution for SSG includes the following components:

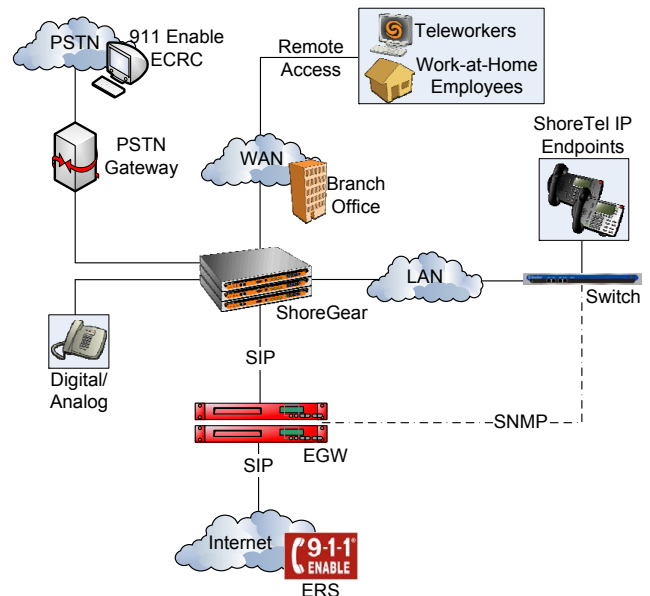
- **The Emergency Routing Service (ERS)**
The ERS is a monthly subscription service that provides nationwide connectivity to PSAPs in both the US and Canada.
- **The Emergency Gateway (EGW)**
The EGW is an on-site appliance that delivers 911 calls and location information to the Emergency Routing Service. It includes automatic IP phone discovery, on-site security notification, and call recording features.



Network Architecture

911 Enable's solution allows organizations to centrally manage their E911 system and is well-suited for SSG deployments that include branch offices, teleworkers, and work-at-home employees.

In a typical deployment, a redundant pair of EGWs is co-located with the SSG. 911 calls are routed from the SSG to the EGW, which then delivers the calls to the ERS using SIP. A connection to the PSTN is required to route calls to 911 Enable's 24/7/365 Emergency Call Response Center (ECRC) in the event of server or network failure.



Provisioning the EGW

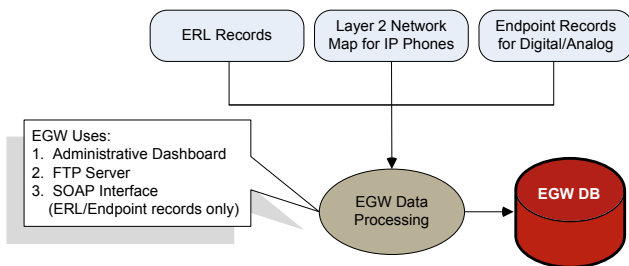
The EGW is provisioned with emergency response locations (ERLs) to enable proper call routing and delivery of accurate location information to the PSAP. ERLs are precise geographic zones at an enterprise which are used to identify where 911 callers are located. When 911 is dialed, the EGW retrieves the correct ERL for the phone and sends the call and location information to the ERS for termination at the PSAP.

The EGW automatically discovers IP phones connected to the SSG and maps them to ERLs. To enable automatic tracking of IP phones, it is first necessary to provision the EGW with a layer 2 network map. This allows the EGW to retrieve the correct ERL based on a phone's network location.

Digital and analog phones can be provisioned and assigned to ERLs in the EGW automatically using scripts.

ERL records, layer 2 maps, and digital/analog endpoints may be uploaded to the EGW using one of the following methods:

- Administrative Dashboard web interface
- FTP server
- SOAP interface (*ERLs/Endpoints only*)



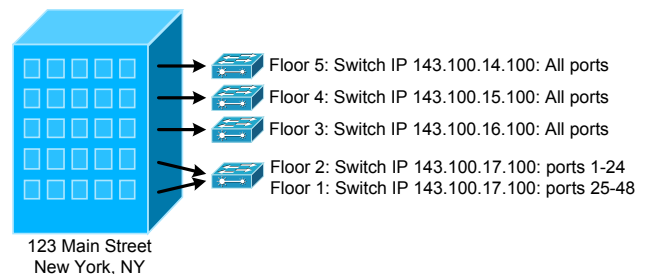
Automatic IP Phone Discovery

The EGW automatically discovers and tracks ShoreTel IP phones on the enterprise network using layer 2 discovery. It first obtains the IP phone inventory and then proceeds to discover phone locations.

Layer 2 Discovery

Layer 2 discovery works by associating ERLs to specific layer 2 switches and switch ports.

The EGW periodically scans the network using SNMP to match IP phone MAC addresses with switch ports. When 911 is dialed, the EGW uses the phone's MAC address to look up the corresponding layer 2 switch/port and ERL. Layer 2 discovery is the preferred method for enterprises that have accurate wiring closets (e.g. a reliable mapping of switch ports to endpoints) and require highly granular location provisioning.



On-Site Security Notification

In the event of an emergency, the EGW delivers crisis alerts to on-site security personnel, notifying them of the emergency and providing them with the caller's precise location information. Crisis alerts are sent via email, on-screen pop-up, pager, and/or SMS. This feature allows for improved coordination amongst emergency teams and reduces response times when seconds count.

Support for Shared Call Appearance/ Extension Mobility

The ShoreTel shared call appearance and extension mobility features for IP phones improve workplace efficiency. However, they can be problematic for E911, as these features compromise the reliability of location information associated to an endpoint's phone/extension number. For example, if multiple phones share the same extension number, sending a unique location to the PSAP when a phone dials 911 may be problematic.

911 Enable solves the challenges of shared call appearance/extension mobility by locating phones based on their MAC address rather than their DN or extension. This allows the EGW to maintain a reliable

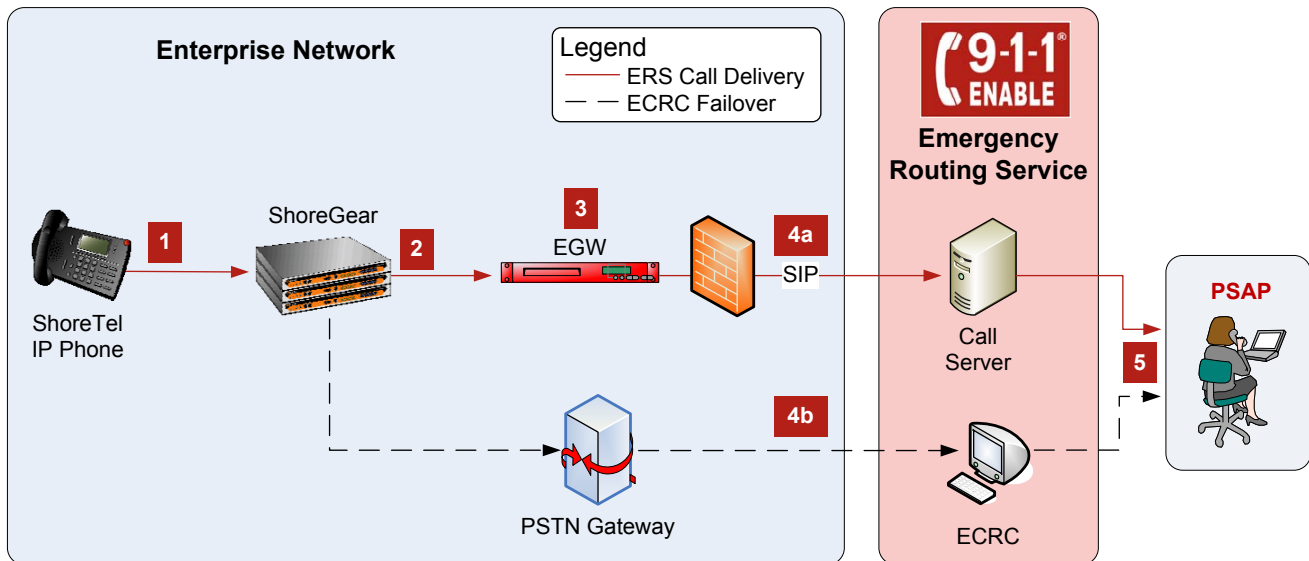
mapping between phone and network location, in order to properly identify the locations of phones.

Support for Non-DID Stations

In the event that a 911 call is disconnected or dropped, the PSAP dispatcher must have the ability to call back the 911 caller. This capability is not an issue for phones with direct numbers (DID), but can be problematic for non-DID stations. The EGW solves this difficulty using Extension-Bind technology. When 911 is dialed from a non-DID station, a DID is selected from a small pool of numbers (maintained within the EGW) and is dynamically assigned to the call. The DID appears on the PSAP dispatcher's display terminal and can be used if the 911 call is dropped.

E911 Call Routing

The following diagram illustrates a typical E911 call flow in an SSG deployment.



Step	Description
1	ShoreTel IP phone makes a 911 call.
2	SSG forwards the call and MAC address to the EGW.
3	EGW uses the MAC address to determine the location of the caller.
4	a EGW forwards the call to the ERS using SIP. b In the event of server or network failure, the 911 call is routed to the Emergency Call Response Center (ECRC) via a PSTN gateway. The ECRC is staffed 24/7/365 by professionally trained personnel who obtain the caller's location information and determine the appropriate PSAP.
5	The call and location information are delivered to the appropriate PSAP.

Solution for Small and Medium Businesses

Small and medium businesses (SMBs) using SSG require a dependable, enterprise-class E911 solution that supports the entire workforce in a simple and cost-effective manner. However, this is often a challenge for today's IP-enabled SMBs, whose deployments may include branch offices, work-at-home employees and/or teleworkers.

For SMBs that do not require automatic IP phone tracking and support for shared call appearance/extension mobility features, 911 Enable offers the Emergency Routing Service (ERS) as a stand-alone service. This "E911 as a service" solution allows companies of 5 to 500+ users to quickly deploy and seamlessly integrate E911 service with SSG to provide E911 call routing to over 6,000 PSAPs across the US and Canada. The ERS supports the entire deployment, including staff in remote branches, work-at-home employees, and teleworkers. Additionally, it is scalable and has the flexibility to grow with the business.

Specifications

Item	Specifications
Supported SSG Systems	<ul style="list-style-type: none">• 9.1 and up
Telephony	<ul style="list-style-type: none">• Signaling Protocols: SIP/UDP• Payload: RTP/UDP, G.711• Capacity: 40 concurrent calls
Layer 2 Discovery	<ul style="list-style-type: none">• Layer 2 Protocols: SNMP v1, SNMP v2, Bridge MIB (RFC 1493)• Capacity: Up to 2000 switches• Compatibility: All switch vendors that support Bridge MIB (RFC 1493)• Supported Phones:<ul style="list-style-type: none">- All ShoreTel IP phones
Capacity	<ul style="list-style-type: none">• Max ERLS: 500,000• Max Endpoints: 120,000• Max number of servers: 64
Alerting Capabilities	<ul style="list-style-type: none">• Crisis Alert Email - includes time, location, and callback number of caller• Security Desk Monitoring• Security Desk Direct Call Delivery
Reporting	<ul style="list-style-type: none">• Call Detail Records - includes location data information• Call Recording• Emergency Response Location Reports• Endpoint Status Reports• Test Call status
Location Provisioning	<ul style="list-style-type: none">• Phones provisioned in real-time using MSAG validation tool• ERL batch file provisioning (FTP)• ERL/Endpoint using real time web services (SOAP interface)

Who Is It For?

If you answer yes to any of the following questions, 911 Enable's solution for SSG may be the right choice for you:

- **Are you concerned that the mobility of IP phones will pose problems for E911?**
- **Do you require E911 support for branch offices, work-at-home employees, and/or teleworkers?**
- **Are you looking to comply with your state E911 legislation?**
- **Would you like to take the guesswork out of implementing a highly reliable E911 solution for your organization?**
- **Are you looking for a cost-effective, enterprise-wide E911 solution which is simple and easy to manage?**

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Additional Resources

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Emergency Routing Service Data Sheet for the US

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