



**Innovation in
Secure, Highly Reliable
Communications**

Connections that Matter®

Text 9-1-1 Update

June 4, 2013



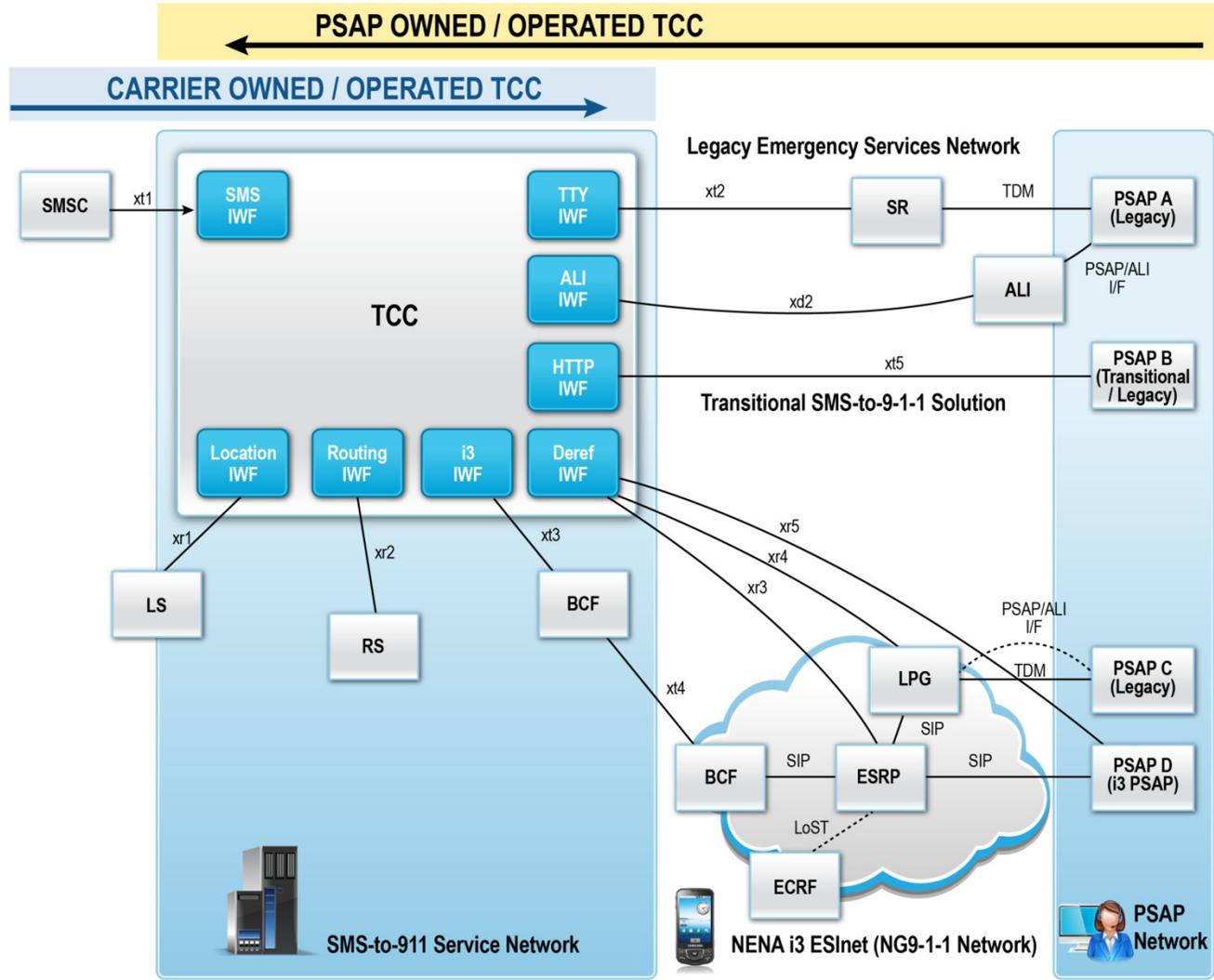
Agenda

- » TTY-ToIP implementation architectures
- » Location technology update
- » Small carrier compliance options
- » Security – policy credentialing

TTY Demarcation

- » J-STD-110 describes call flow for text-to-TTY
- » No demarcation of responsibility
- » Implementation practice
 - Connectivity from the text-to-TTY router to the PSAP
 - Selective router (SR) to text-to-TTY router connectivity
- » Cost assignment and cost recovery unclear
- » Text-to-TTY session conversion complexity
- » PSAPs may need to implement trunks

TTY Demarcation/Ownership



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SMS 9-1-1

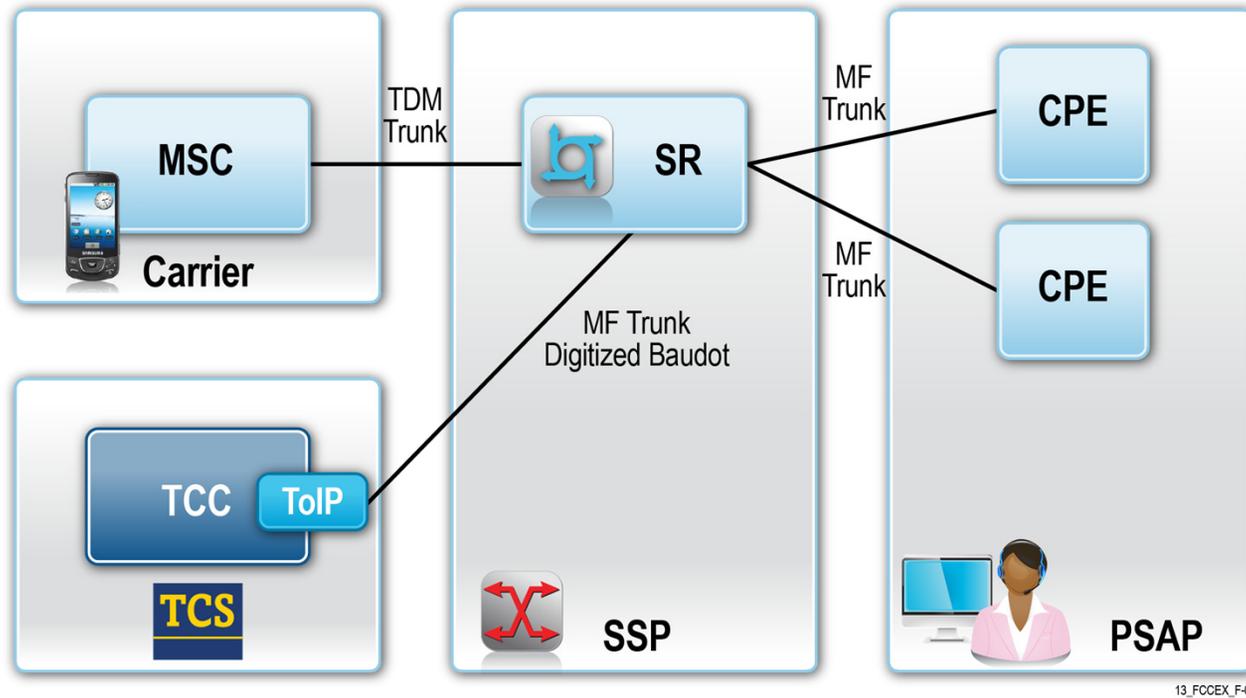
Deployment Options for ToIP Gateway Placement

1. TTY Default Model (Integrated with TCC)
2. TTY SR Integration Deployment Model
3. TTY Local PSAP Deployment Model



ToIP Gateway

TTY Default Model (Integrated with TCC)





ToIP Gateway

TTY Default Model (Integrated with TCC)

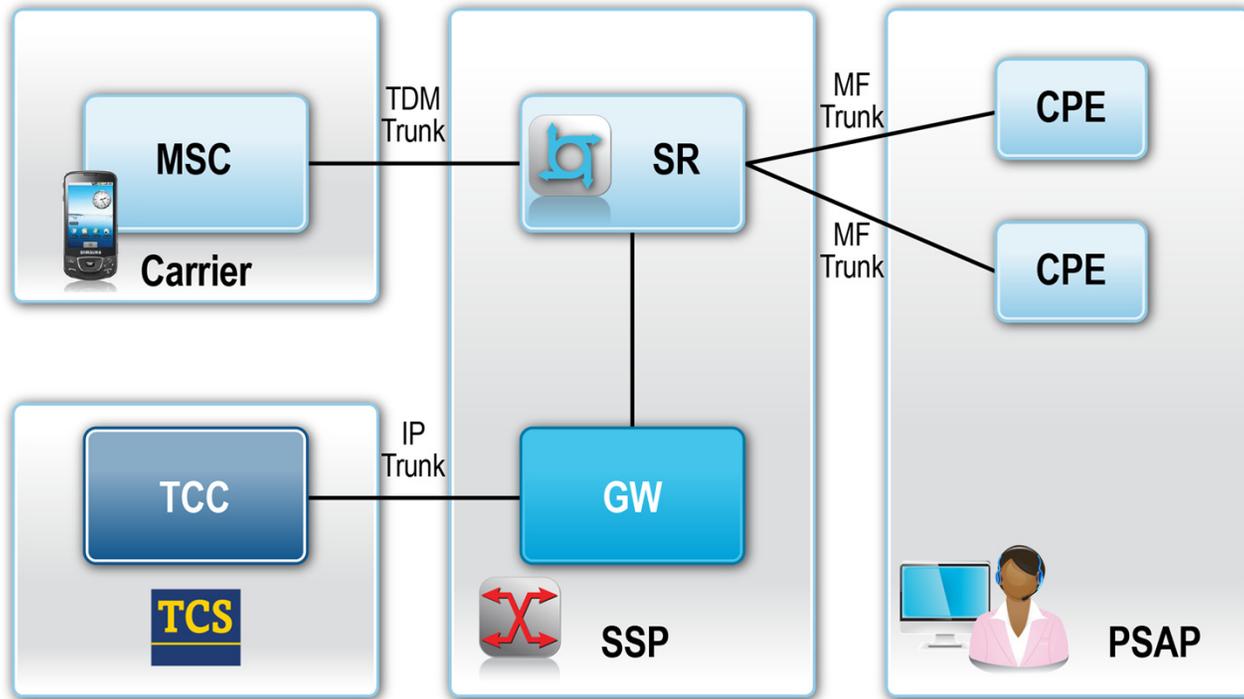
» Impacts

- ☑ Hosted gateway service
- ⊘ TDM trunk costs
- ⊘ Digitized Baudot requires careful tuning
- ⊘ Impacts every SR
- ⊘ Requires additional port capacity on SR
- ⊘ Configuration changes to SR



ToIP Gateway

TTY SR Integration Deployment Model



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ToIP Gateway

TTY SR Integration Deployment Model

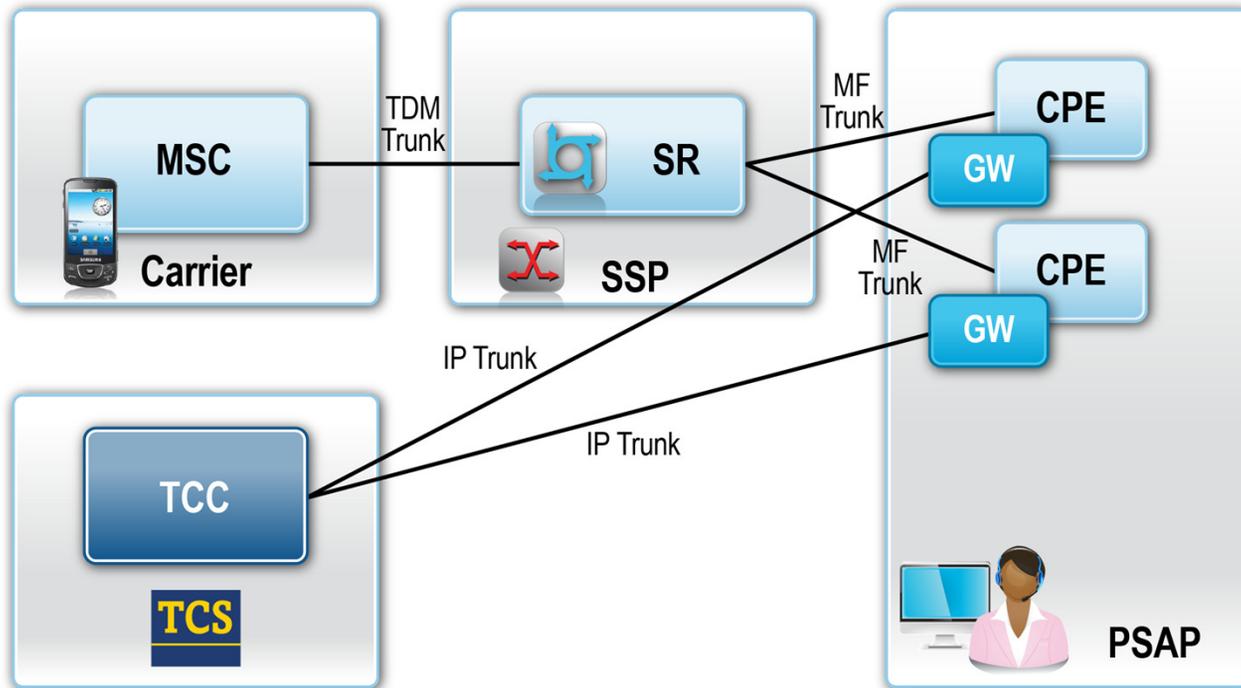
» Impacts

- ☑ Can leverage existing SR to PSAP trunks
- ☑ IP circuits to SR facility
- ☑ No additional tuning should be required for Digitized Baudot
- ⊘ Additional SR port/card capacity required
- ⊘ Configuration changes to SR
- ⊘ Extensive number of gateway deployments



ToIP Gateway

TTY Local PSAP Deployment Model



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ToIP Gateway

TTY Local PSAP Deployment Model

» Impacts

- ☑ Requires small footprint gateway hardware at PSAP
- ☑ No additional TDM trunks
- ☑ Reliable IP circuits to gateways
- ☑ Digitized Baudot tuning eliminated
- ☑ No change to SR configuration
- ☑ Shortened deployment per PSAP timeline
- ⊘ Requires additional CPE port capacity
- ⊘ Very large number of gateway deployments

Location Determination

- » TCC queries location from wireless carrier that sent text message to the TCC
- » TCC selects appropriate PSAP to route text message based on coarse location
- » Coarse commercial location is delivered to PSAP
- » For mid-call location update, TCC will query wireless carrier that sent text message for commercial precise location

Location Considerations

- » Commercial location platform is required
- » For roaming subscribers, text messaging served by home wireless carrier, not serving wireless carrier
 - Causes location roaming challenges
- » J-STD-110 supports true location-based routing using PSAP shapes
 - Differs from wireless routing, which uses table-based exception routing
 - May route to non-designated PSAP in border situations
- » Fast location used for initial routing to appropriate PSAP
- » Uses best commercial location that carrier can provide

Location Recommendations

- » Provide routing parity between SMS 9-1-1 and wireless E9-1-1 using coarse location
- » Promulgate “best effort” precise commercial location usage for SMS-1-1 upon re-bid.

Small Carrier Compliance Options

- » Tier 3 & 4 carriers require commercial location service deployment to receive coarse location
- » Precise position requires commercial precise location service
 - Additional switch features usually required
 - Barrier to adoption of precise location
- » Bounce back message compliance not tied to location support

Security – Policy Credentialing

» PSAP Credentialing Agency

- ❑ Certificate Authority (CA)
- ❑ Applies to any i3 node-to-node communication
- ❑ Necessary for NG9-1-1
- ❑ X.509 PKI certificates
- ❑ Revocation of certificates list (RCL)
- ❑ Applies to one-to-one or one-to-many scenario

» Recommend further investigation

Summary of Recommendations

- » Provide routing parity between SMS 9-1-1 and wireless E9-1-1 using coarse location
- » Promulgate “best effort” precise commercial location usage for SMS-1-1 upon re-bid
- » Recommend further investigation of need for and creation of a Certificate Authority for PSAP credentialing

Thank you!

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TCS

Acronyms

Acronym	Definition
ALI	Automatic Location Identifier
BCF	Border Control Function
CA	Certificate Authority
CPE	Customer Premise Equipment
Deref	Dereference
E9-1-1	Enhanced 9-1-1
ECRF	Emergency Call Routing Function
ESInet	Emergency Services Internet Protocol Network
ESRP	Emergency Services Routing Proxy
GW	Gateway
HTTP	Hypertext Transfer Protocol
I/F	Interface
IP	Internet Protocol
IWF	Interworking Function
LoST	Location to Service Translation
LPG	Legacy PSAP Gateway
LS	Location Server
MF	Multi-Frequency
MSC	Mobile Switching Center
NENA	National Emergency Number Association

Acronym	Definition
NG9-1-1	Next Generation 9-1-1
PKI	Public Key Infrastructure
PSAP	Public Safety Answering Point
RCL	Revocation of Certificates List
RS	Routing Server
SIP	Session Initiation Protocol
SMS	Short Message Service
SMSC	Short Message Service Center
SR	Selective Router
SSP	System Service Provider
TCC	Text Control Center
TCS	TeleCommunication Systems, Inc.
TDM	Time Division Multiplexing
ToIP	Text over Internet Protocol
TTY	Teletype
xr	Interface reference id (per ATIS/TIA J-STD-110)
xt	Interface reference id (per ATIS/TIA J-STD-110)