



XOPNetworks



How to support Firebar/Emergency Conferencing as you migrate your network to a Next Generation Network (NGN)

An XOP Networks White Paper

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EXECUTIVE SUMMARY

Competition is forcing the Independent Local Exchange Carrier (ILEC) to migrate from the traditional TDM network to a Voice over IP (VoIP) network. The new network must be able to provide "Triple Play Services (VoIP, Internet & Video)" in order to effectively compete against carriers such as Wireless Operators, Vonage and Skype. The new network strategy for ILECs generally revolves around introduction of over a fiber-to-the-home/curb distribution networks and VoIP based Digital Loop Carriers (DLCs) and Digital Subscriber Line Access Multiplexors (DSLAMS).

One of the challenges of this strategy is how to continue to support traditional services such as Firebar/Emergency Conferencing in the new world of VoIP and at the same time support the legacy TDM network

In traditional TDM/Analog networks, it has been common practice to install a Tellabs 291/292 Firebar conferencing system between the equipment side and the line side of the Main Distribution Frame (MDF) that connects to a subscriber line, as illustrated on Figure 1.

Unfortunately, in the next generation networks, there is no copper 2 wire plant anymore, either at the central Office or in the distribution network, and so there is no point at which to connect the Tellabs 291/292 system.

Volunteer emergency responders who are used to having their home phone continuously ring when an emergency occurs are now without a service! In addition the traditional Firebar is very inflexible and to even make simple changes require re-run MDF jumpers etc.

What is needed is technology that works effectively in a multivendor, TDM and VoIP environment, and emulates the features and services of the old Firebar service.

The XOP Networks' Universal Service Node (USN) with the Enhanced Firebar application can answer all of these challenges, while reducing both CAPEX and OPEX for the operating companies.

TYPICAL ILEC NETWORK TRANSITIONING TO VOIP

In this network scenario, the ILEC is being driven by competition to evolve the network to support triple-play (VoIP phone, Internet & Video). Typically such an ILEC will have to Fiber-to-the home/Fiber-to-the curb and IP based access network elements (IP based DLCs, Session Border Controllers, WiMax etc.)

However, no operating company implements such a change over night. This kind of change will occur over a period of time. The service provider will typically deploy a soft switch in addition to the current legacy switches. During this phase, the operating company will cap any new subscriber additions to the legacy network and add new subscribers to the IP Network. When they have reached critical mass, they will move their remaining customers from legacy switches to the soft switch and phase out the older legacy switches. This transition period could last for several years depending upon the number of switches involved.

During this period, the operating company will need to provide Firebar/Emergency Conferencing to sets of customers on the TDM and VoIP network. In addition the Firebar service has to be flexible with moves and changes easily accommodated. Before we look at the solution, it is important to understand how the traditional Tellabs based Firebar system operates.

TRADITIONAL FIREBAR/EMERGENCY CONFERENCING NETWORKS

In the past, the Firebar/Emergency conferencing systems have been deployed at the Telco Class 5 switch in the 2-wire line circuit that normally connects to the subscriber's line and hence phone as illustrated in figure 1 following:

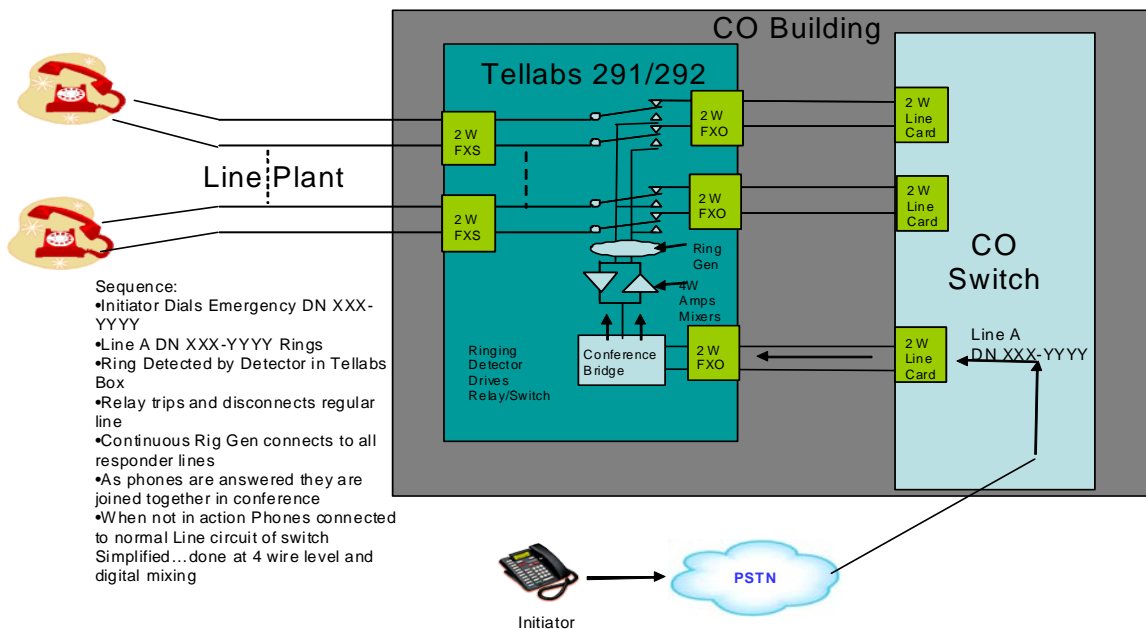


Figure 1: Traditional Firebar/Emergency Conferencing Networks

*Tellabs 291/292 in a registered trademark of Tellabs, Inc.

TRADITIONAL SERVICE - OPERATION

Sequence:

- Initiator Dials Emergency DN XXX-YYYY, Initiator can be anywhere on PSTN.
- Emergency line DN XXX-YYYY Rings
- Ring Detected by Detector in Tellabs Box, Call answered and initiates the bridge
- Relay trips and disconnects responders subscriber line
- Continuous Ring Generator connects to all responder lines. Continuous ring identifies call as "Emergency"
- As phones are answered they are joined together in conference
- When not in action, subscriber phones connected to normal Line circuit of CO, and normal subscriber line service is available.

TRADITIONAL SERVICE - DISADVANTAGES

- All responders must be on the same CO switch
- Very inflexible, moves and changes require re-jumpering of MDF
- Cannot work in a fiber/non copper environment
- Telcos forced to discontinue service when introducing fiber and/of VoIP
- Tellabs 291/292 is manufacturer discontinued and hence, support difficult.

FIREBAR NEXT-GENERATION-NETWORK PROBLEM DEFINITION

In Figure 2, the ILEC has introduced fiber-to-the-home/curb and is replacing the legacy TDM switch, with a softswitch and VoIP. Unfortunately it is now totally impractical to deploy the Tellabs 291/291 Firebar system.

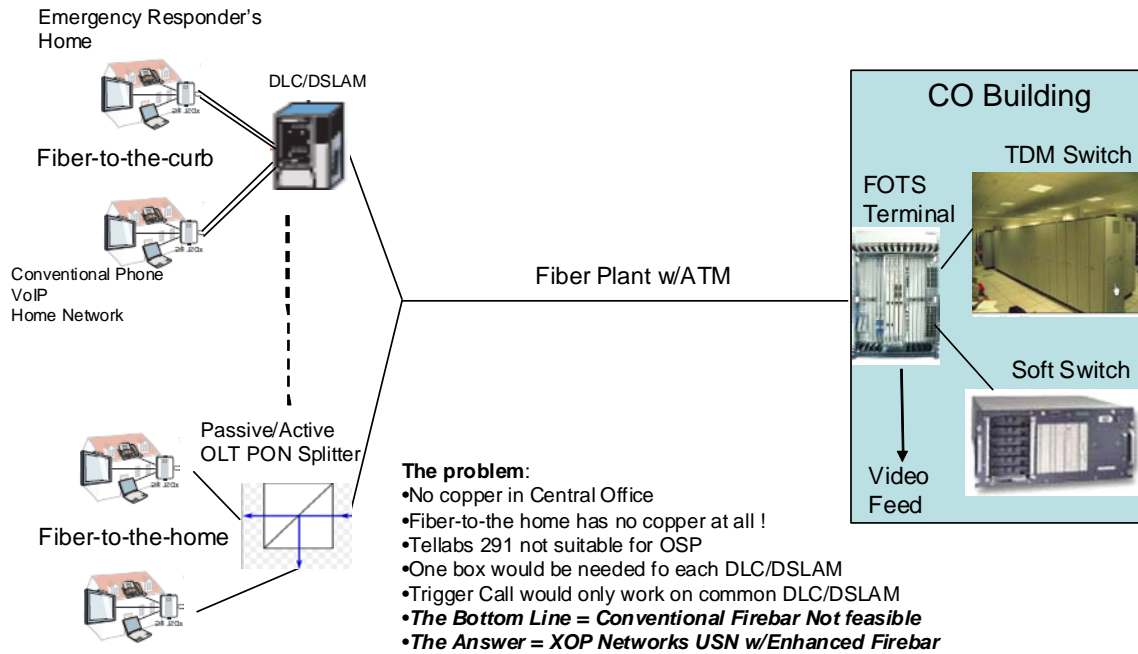


Figure 2: Firebar: NGN Problem Definition

THE XOP NETWORKS' SOLUTION

In the following diagram, the deployment of the XOP Networks Universal Service Node (USN) in an evolving ILEC network can be seen. The XOP Networks USN with Enhanced Firebar application provides Firebar service for both Emergency responders/subscribers connected to the remaining legacy TDM switches as well as to the newer soft switch.

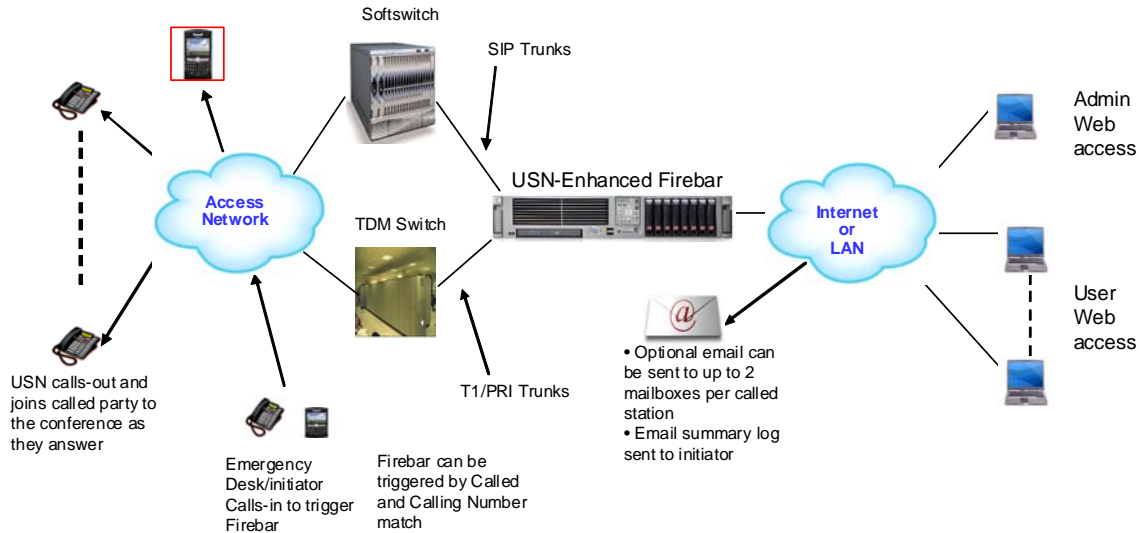


Figure 2: XOP Networks' Solution – USN with Enhanced Firebar Application

XOP NETWORKS' SOLUTION ADVANTAGES

- Works in a TDM and VoIP environment simultaneously
- Responder groups can be split over multiple switch nodes.
- Works in fiber-to-the-home/curb and copper subscriber networks.
- Responder and initiator have identical to legacy method-of-operation.
- Very flexible. Moves and changes by software only.
- Can call multiple stations for each responder, i.e., home phone, cell phone, office phone.
- Email Alert also possible
- Firebar conference can be recorded and played back via web interface.
- Significant CAPEX and OPEX reductions

OTHER CONSIDERATIONS

PHYSICAL CONSTRAINTS

In terms of physical space, a new system with typically with typically 24 ports should not take up more a 1U space on a standard telco rack. The server must be industrial grade and available in a number of configurations, i.e., 48VDC, 1:1 hot standby, RAID1 Mirrored Disks, redundant power supplies and NEBS compliant hardware.

FUTURE SERVICE EVOLUTION

Given the placement of the USN, i.e. on the trunk side of the switching platform, it becomes very simple to add additional services such as Audio Conferencing, Web Conferencing, Video Conferencing, Alert/Mass Notification, and Voice Mail. These new value added services will enable the ILEC to maintain and grow its subscriber base and at the same time, significantly reduce CAPEX and OPEX.

CONCLUSION

In networks where legacy TDM switches are already deployed (e.g., Mitel GX 5000, Nortel DMS 10/100, Lucent 5E, etc.), and the ILEC wants to migrate to a VoIP network and as such wants to cap the TDM network, the XOP Networks' USN with Enhanced Firebar application makes perfect sense.

Its support for both TDM and VoIP networks enable Firebar service to work seamlessly across both networks. Over a period of time, the carrier can migrate all subscribers from the TDM network to the VoIP network and the change will be completely transparent to the Firebar responders. Network administration is very much simplified with most changes taking place via software downloads and web based control.

New value added services that are added to the USN will enable the ILEC to maintain and grow its subscriber base and at the same time, significantly reduce CAPEX and OPEX

ANNEX 1 FEATURE SET: ENHANCED FIREBAR APPLICATION

The XOP Networks' Firebar application resides on the USN that is deployed on the trunk side of the switch. It provides several enhancements.

- Send calls to any landline or cellular phone instead of just dedicated 'red' or emergency phones
- Select communications medium to be used for message delivery (Voice only, Email only, SMS only or any combination etc.). Support unlimited number of call out groups
- Send caller-ID of your choice that can be used by recipient's phone to display associated 'caller name' (e.g., Fire Chief)
- Trigger a dial-out based on a) incoming phone call, b) click on a web portal, c) dry contact closure or at a scheduled time
- Provide summary and detailed reports on call completions (Busy, No Answer, Answering machine etc.)

FEATURE	HOW IT WORKS	BENEFITS
Multiple emergency specific groups	Set-up via Web Dashboard	Pre-planned group members may belong to different organizations (Fire, Police, and EMS etc.).
Blast Dialing	Set-up via Web Dashboard, triggered via dial-in or Web.	Multiple first responders are called in parallel - reduces the overall time required to contact.
Dial out with Find-you	Set-up via Web Dashboard, triggered via dial-in or Web. Up to four phone numbers per individual.	Improves the probability of reaching an individual first responder.
Audio-conferencing	Set up via Web Dashboard. Automatic conference join-in after entering security code.	Make emergency conference secure.
Call logging	Automatic recording of Firebar calls.	Recording of the audio and the accompanying event log with time stamps, post-event analysis is simplified
Simultaneously sending email, SMS and Pager based messages	Set-up via Web Dashboard, triggered via dial-in or Web.	Helps in disseminating emergency related information with multiple media while voice conference is in progress.

ANNEX 2 – NETWORK COMPATIBILITY

XOP Networks products are deployed against a number of Central Office Switches; IP based Soft switches, PBXs, Hybrid PBXs and IP PBXs in the field. The table below provides a list of such platforms and their specific interfaces that our products have proven interoperability with.

XOP Networks Interoperability Matrix			
Manufacturer		Interface	Protocol
Lucent	#5ESS	Analog	Loop Start, Centrex
Lucent	#5ESS	T1	ISDN PRI
Nortel	DMS-10, DMS-100	T1	CAS T1, E&M
Mitel	GX-5000	T1	CAS T1, E&M, MF
Mitel	GX-5000	T1	CAS T1, E&M, DTMF
Sonus	GSX-9000	T1	CAS T1, E&M
DSC	DEX-600	T1	ISDN PRI
Siemens	EWSD	E1	ISDN PRI
Coppercom	CSX	T1	CAS T1, E&M
Taqua	OCX1000	T1	CAS T1, ISDN PRI
Ericsson	AXE 10	E1	ISDN PRI
Huawei	CO Switch	E1	ISDN PRI
Manufacturer	IP Soft Switch	Interface	Protocol
Broadsoft	Broadworks VoIP	Ethernet	SIP Trunk
Meta switch	MetaSwitch	Ethernet	SIP Trunk
Emergent	Softswitch	Ethernet	SIP Trunk
Manufacturer	PBX	Interface	Protocol
Toshiba	DK-280	Analog	Loop Start Trunk
Inter-tel	GLX	T1	CAS T1, Loop Start
Panasonic	TD-500	T1	CAS T1, E&M
Panasonic	TD-600A	T1	ISDN PRI
Avaya	8710	T1	CAS T1, E&M
Avaya	AVAYA G3i R9.5	T1	ISDN PRI
Nortel	Meridian 81c	T1	ISDN PRI
Nortel	SL-100	T1	ISDN PRI
NEC	NEAX 2400 IPX	T1	ISDN PRI, CAS T1 E&M
NEC	NEAX 2000 IPS	T1	ISDN PRI, CAS T1 E&M
NEC	Univerge 7000 IVS	T1	ISDN PRI, CAS T1 E&M
Cisco	IP PBX (Call Mgr 4.1)	T1	ISDN PRI
Cisco	IP PBX (Call Mgr express)	T1	ISDN PRI
Mitel	SX2000	T1	ISDN PRI
Mitel	SX2000	T1	CAS T1 E&M
Manufacturer	Hybrid/ IP PBX	Interface	Protocol
Avaya	IP Office 4.0+	Ethernet	H.323 Trunk
Avaya	8800	Ethernet	SIP Trunk
NEC	Univerge 7000 IVS	Ethernet	Station Side SIP
NEC	NEAX 2000 IPS	Ethernet	SIP Trunk
Cisco	IP PBX (Call Mgr express)	Ethernet	SIP Trunk
Cisco	IP PBX (Call Mgr 4.1)	Ethernet	SIP Trunk
Asterisk	Asterisk Server	Ethernet	Station Side SIP
Asterisk	Asterisk Server	Ethernet	SIP Trunk

Want to Learn More?

For more information, please visit our Web site <http://www.xopnetworks.com> or send an email to marketing@xopnetworks.com

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About XOP Networks

XOP Networks, founded in 2002, is a leading supplier of TDM and IP based value added services platforms for Enterprises and Independent Telephone Companies. Its unique product architecture allows smooth migration of value added services from legacy circuit switched TDM networks to VoIP based packet networks. Its products support Audio Conferencing, Web Conferencing, Group Alerting, Enhanced Firebar, Voicemail and a few other services. XOP Networks is headquartered in Plano, Texas. XOP Networks uses its platforms and network for offering managed services as well

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