



**XOP**Networks

# **SMS based Instant Conferencing – A Value Added Service for Mobile Service Providers**

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*An XOP Networks White Paper*

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**EXECUTIVE SUMMARY**

Cellular phones are common place in most of the countries worldwide. Due to intense competition Mobile Service Providers are constantly adding newer value added services to their networks to maintain and improve their Average Revenue Per User (ARPU).

The use of Unified Communications and specifically Audio conferencing is continuing to increase rapidly. Most cell phones only permit 3-party conference calls, with very limited features/functionality and if communications from the initiator fail (i.e., going under a bridge etc..), the entire conference is lost.

XOP Networks has introduced SMS initiated Audio Conferencing on its Universal Service Node (USN) platform – we call this application “**Instant Conferencing (IC)**”.

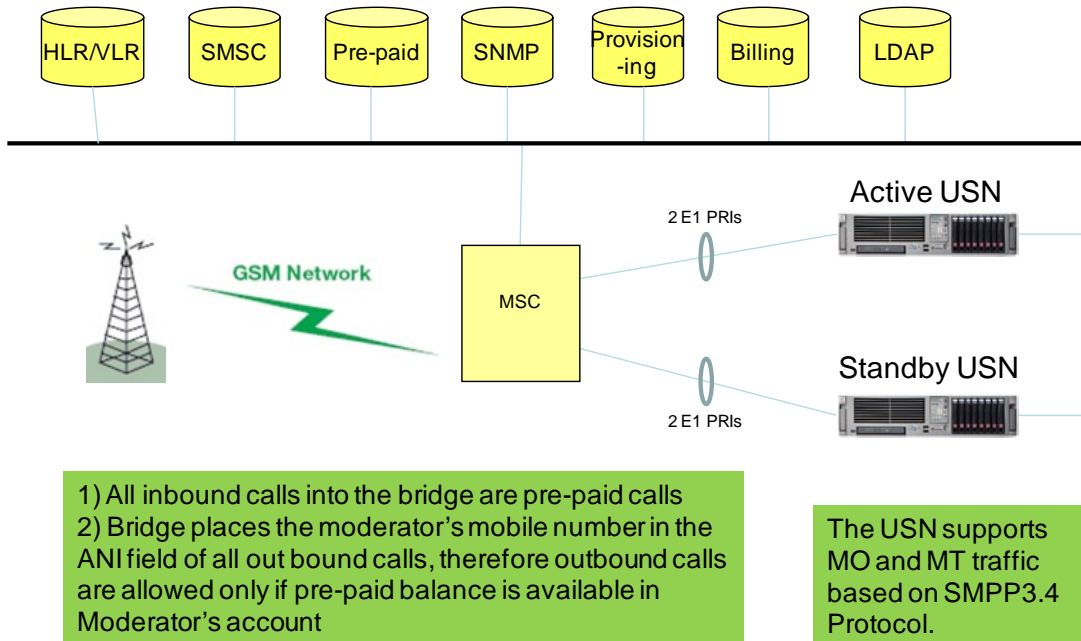
With Instant Conferencing, a subscriber can simply send a SMS to the USN located in the Mobile Service Provider’s network. Based on the content of the SMS message, the USN deciphers the parties that need to be joined into a conference. It then launches outbound phone calls towards the initiator and the intended participants and upon answer, places them into a multi-party audio conference.

One of the other capabilities of the XOP Networks’ USN, is its ability to interface to both TDM and VoIP networks, making it ideally suitable for Mobile Service Providers with legacy TDM based MSCs or with Soft Switch based MSCs that support VoIP trunks.

This white paper discusses the details of how SMS based Instant Conferencing service can be implemented in a Mobile Service Provider’s network.

## WHAT IS SMS BASED INSTANT CONFERENCING?

Often we need a quick meeting with a few people on the fly. There is no time for sending an invitation with the conference bridge credentials etc. The XOP Network's SMS based Instant Conferencing Application is designed to do just that. The XOP Networks USN platform supports SMPP3.4 protocol for interfacing with external SMSCs. This capability allows the USN to support both Mobile Originating (MO) and Mobile Terminating (MT) traffic. Therefore a subscriber can simply send a SMS text message to a short code assigned to the USN. The subject area of the SMS contains information about the people you want to have conference with. The USN parses the message and then dials out to the numbers associated with names in the SMS text message. As recipients pick up their phones, they are placed into a conference with the subscriber.



USN: Universal Services Node

Figure 1: Typical implementation of Instant Conferencing in a Mobile Service Provider's Network

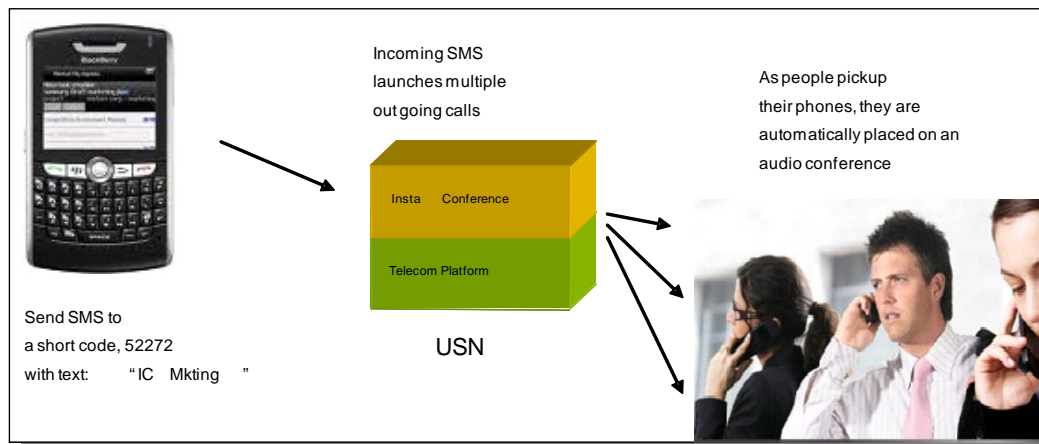
## HOW DOES IT WORK?

An Instant Conference subscriber can set up 'Users' and place them into frequently used 'Groups' via SMS based text messaging. A subscriber can initiate an Instant conference with associated group members simply by sending a SMS text message to e.g., "52272". The subscriber can also create an

ad hoc conference with individual group members by identifying them via nick names on the SMS text message. The SMS can only be sent through a registered mobile. Once you have set-up the groups/participants, there is no need to connect to internet, unless you want to monitor the live conference and view the reports.

### INSTANT CONFERENCE – MAJOR FEATURES & BENEFITS

- Send a SMS and trigger a dial out conference
- Send an inbound call and trigger a dial out conference
- Use SMS to create users and place them into groups
- Unlimited number of Users and Groups per Subscriber account
- Send SMS message (optional) in addition to the out dialed voice calls (for allowing call back and joining the conference)
- Send Group SMS only (SMS Blast)
- Drop the conference if Subscriber leaves the conference
- Two minute hysteresis timer to prevent inadvertent Subscriber call drop due to network congestion or human error
- Ability to record calls on the fly
- Usage reporting and call logs



Cellular Operator will need to assign a short code for routing SMSs to the USN.

IC – Instant Conference

Figure 2 shows call sequence of SMS initiated Instant Conference

| FEATURE                                   | HOW IT WORKS   | BENEFITS   |
|---|--|--|
| Create a Group using SMS.                 | Subscriber can create a group by sending a SMS with list of phone numbers.   | Subscriber does not have to be logged on to the web portal before he/she can create a group.         |
| Initiate an audio conference using a SMS. | Subscriber can send a SMS to a short code assigned to the USN. Upon receiving the SMS the USN will parse the text message and derive appropriate phone numbers from it. It will then dial out to those numbers and upon pickup place people into a conference. | Enable ad-hoc conference from a mobile phone without requiring any pre planning.                     |
| Assign Nick Names to your participants.   | Subscriber can assign nicknames to potential participants.   | Saves on data entry when sending a SMS.  |
| Subscriber hysteresis timer.              | In case a Subscriber's call gets dropped and he/she does not call back within 2 minutes, the conference is terminated.   | Subscriber presence is required for conference to continue. Protects Subscriber from fraudulent use. |

### *INSTANT CONFERENCE – OTHER FEATURES*

The Instant Conference will end in two minutes after the subscriber hangs up his/her phone. If the initiating subscriber calls back within two minutes of the hang up, the conference continues. This capability is useful in case the subscriber's phone connection is advertently disconnected.

Alternative solutions to the disconnect scenario are possible, i.e., if the initiating subscriber's call gets dropped, the system can be programmed to call the subscriber back automatically and rejoin him/her back into the conference. Again the system can be programmed to limit the number of retries (typically 3) before the automatic disconnect timer is started. In order to recognize an intentional clear-down from the initiating subscriber, an end-of call signal needs to be assigned, e.g., \*\* = hang-up.

In addition to SMS initiated conferencing, a subscriber can program speed dial keys for pre-built conferences. The subscriber will be able to launch a particular Instant Conference just by pressing a speed-dial key. This feature is effective when trying to reach same set off people quickly (e.g., communicate with your direct reports, call your family members etc.).

Only one subscriber is allowed to be present in one Instant Conference. If two callers enter the same activation PIN, the second caller will enter the conference as an attendee.

An Instant conference created via SMS can also be managed from a subscriber web portal and vice versa.

## SOLUTION ENGINEERING

### SMPP 3.4 INTERFACE FOR ACCESSING SMSC

The XOP Networks USN supports SMPP 3.4 functionality to send and receive text messages via SMSC respectively. This capability is leveraged to implement SMS based Instant Conferencing.

### VOICE NETWORK SET-UP

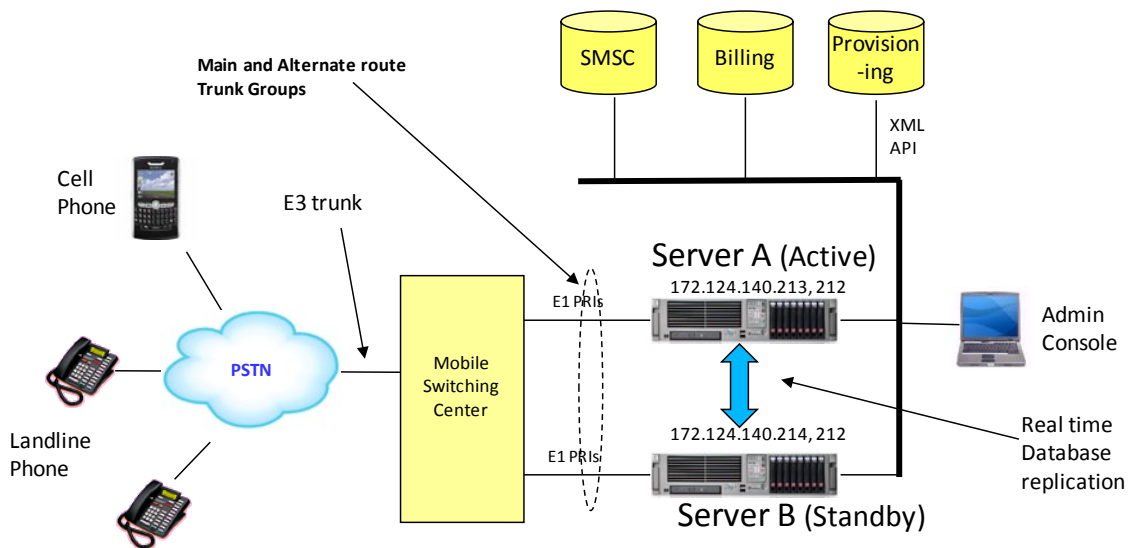


Figure 3: Instant Conference in a typical Mobile Network

Figure 3 shows typical deployment of XOP Networks USNs in a Mobile Service Provider's network. As shown, this service is offered using two XOP Networks' Universal Service Node (USN) platforms. To maintain high availability in the event of network and/or equipment failure, dual servers will operate as Active and Standby. These servers are shown as Server A and Server B in Figure 3. The Server B will be a hot standby to Server A. Normally all traffic will flow through Server A. Only in case Server A is not functional (network/equipment failure, software upgrade activity, etc.) will the traffic flow to Server B.

A main and an alternate route trunk group is set up between the Mobile Service Provider's switch(es) (the MSC switch can be a TDM, or VoIP) and each of the two USNs. Each USN terminates PRI trunks and/or SIP trunks and hence supports the voice paths to and from the servers.

A pool of for example, thirty one (31) destination numbers (or DNIS's), ranging from say 800-679-1400 through 800-679-1430 is assigned to the entire trunk group (main and alternate).

The DNIS 800-679-1400 is used as a common destination number across all Instant Conferences. It is used for Users to dial into the USN and then enter a conference based on the User PIN.

The DNISs 800-679-1401 through 800-679-1430 are associated with individual Instant Conferences. These DNIS numbers are automatically assigned as a Subscriber creates his/her Instant Conferences. Hence one Subscriber can initiate up to 30 different Instant Conferences based on 30 different dialed numbers.

Under normal operation, voice traffic will flow between the Mobile Service Provider's switch and Server A (Active) over the main trunk group. Server B will be kept in warm standby state. In this state, the all voice related functions will stay suspended thereby forcing the Mobile Service Provider's switch to route incoming calls to Server A. The two servers will maintain a heart beat protocol between themselves, thereby communicating the health of each other at all times.

In the event Server A (active) is not operational or Trunks in the main trunk group are 'Out of Service', then Server B (standby) will enable its voice application automatically. The Mobile Service Provider's switch will recognize that the main trunk group is out of service and will route calls to Server B via the alternate trunk group.

### **DATA NETWORK SET-UP**

Each USN has two IP addresses associated with it. The IP 172.124.140.213 is permanently associated with Server A. Likewise IP 172.124.140.214 is permanently associated with Server B. In addition both servers share a floating IP 172.124.140.212. At any given time the floating IP is associated with the server that is acting as the Active server. The other server will be designated as the Standby server. This allows the SMSC, the back office systems and the IC subscribers to communicate with the USN with a single IP address only. Figure 4 shows an implementation of the floating IP concept.

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<sup>1</sup> DNIS – Dialed Number Information Service, same as Destination Number

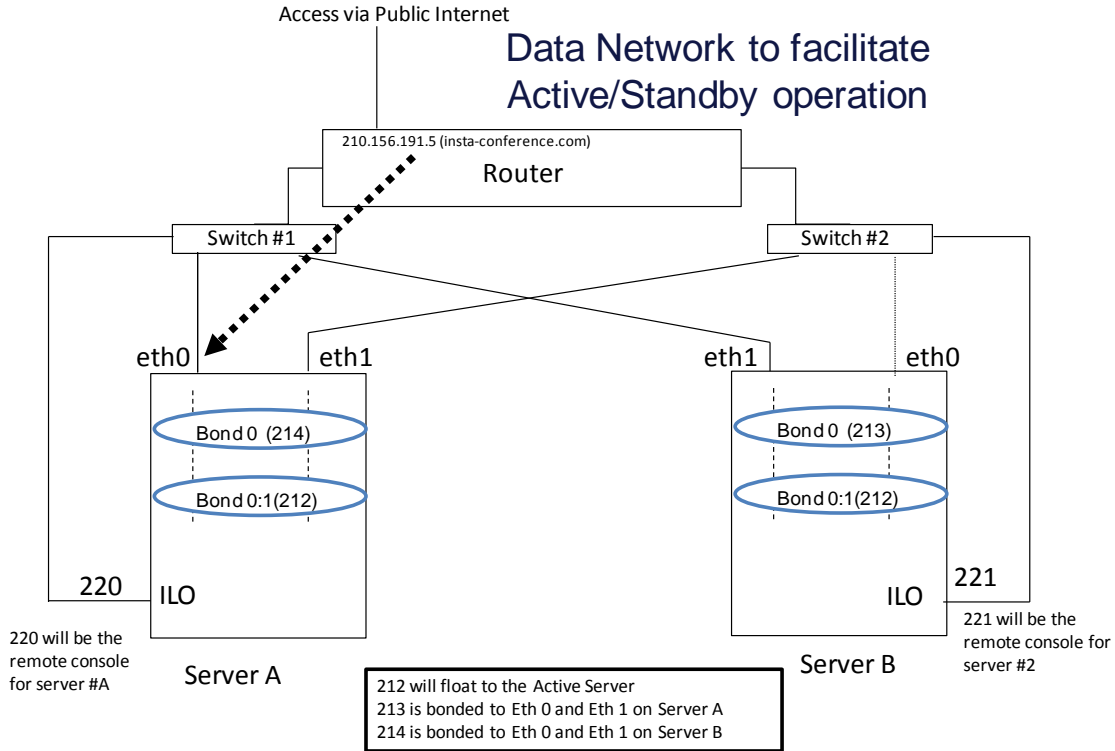


Figure 4: Use of floating IP between Active and Standby Servers

## SUBSCRIBER PROVISIONING

An Instant Conference subscriber account is provisioned in the USN server by adding a 'Subscriber' to the system. There are various attributes of the Subscriber such as name, phone number, e-mails id etc. that can be defined.

Provisioning of Subscriber accounts shall be done via the Mobile Service Provider's CRM System. A XML based provisioning API has been set up between the CRM and the Active Server A. All provisioning changes made to Server A will automatically be applied to Server B through real time database replication.

After a subscriber has signed up for the service, the CRM system will send an XML message to Server A to create a Subscriber account. **Only designated terminals that support the matching 'authentication certificate' will be able to communicate with Server A for this purpose.**

Based on the message received a Subscriber account will be created on the USN and positive acknowledgement will be sent to the CRM system. The CRM system in turn will send an email to the subscriber intimating him/her about the successful set up of the Instant Conference account. The CRM



system will (via email) also provide the login credentials to the subscriber for logging in as a subscriber on the Active Server A.

## ***BILLING***

The Mobile Service Provider will determine the tariff associated with the use of the Instant Conference service. This information will typically be posted on the Mobile Service Provider's web site.

The USN will provide CDRs giving usage details for each conference that has been conducted. The details shall include the Subscriber id, Instant Conference id, the start and stop time for each participant, call direction (dialed in or dialed out), CLI used, DNIS used and the Activation PIN used for the particular Instant Conference and call recording – yes/no. The CDRs for subscribers will be uploaded to the designated FTP site. The uploading of the CDRs will occur automatically and on the hour. The upload will utilize 'Rsync' protocol.

Each USN has the capability to keep the CDRs in its local storage for the previous 3 months.

In addition to the CDRs, a daily usage summary report is generated. This report contains data such as daily subscriber adds or drops, cumulative usage by each subscriber etc. The report is posted into the Mobile Service Provider's Revenue Assurance departments FTP site. The report will typically be uploaded each night at a specified time.

The Mobile Service Provider's billing system will be responsible for tallying the total number of minutes used across all participants in a given Instant Conference and post the appropriate charge into the subscriber's monthly invoice.

All Instant Conference call charges are typically billed to the subscriber's primary account.

## ***SUMMARY***

This white paper described XOP Networks' SMS based Instant Conferencing Service, its features, and how a typical Mobile Service Provider would set-up its network to provide such services.

## APPENDIX A - SMS COMMANDS

A subscriber will be able to use SMS commands for the following functions:

1. Set up Users, including specifying their Nick name, First and Last name, phone number and placing them into Groups. A subscriber will be able to add/delete/edit and lookup Users and add/delete/edit and list Groups via SMS text messaging.
2. Initiate an Instant conference with a) an ad hoc list of Users, b) with a pre-defined Group or c) a combination of ad hoc Users, pre-defined users and Groups.

| Sr. No | SMS command                     | Syntax   | Details  |
|--------|---------------------------------|--|--|
| 1      | UC (User Create)                | <b>UC &lt;nick name&gt; &lt;phone&gt; &lt;first name&gt;&lt;.last name&gt; &lt;[-]group name 1&gt; ... &lt;[-]group name N&gt;</b> | Creates a new user   |
| 2      | UE (User Edit)                  | <b>UE &lt;nick name&gt; &lt;phone&gt; &lt;first name&gt;&lt;.last name&gt; &lt;[-]group name 1&gt; ... &lt;[-]group name N&gt;</b> | Edit a user  |
| 3      | UD (User Delete)                | <b>UD &lt;nick name&gt; OR &lt;phone&gt;</b>   | Deletes a user   |
| 4      | UL (User Lookup)                | <b>UL &lt;search value&gt;</b>   | Lists user's details   |
| 5      | GC (Group Create)               | <b>GC &lt;group name&gt; &lt;nick name OR phone OR group name #1&gt;...&lt;nick name OR phone OR group name #N&gt;</b>             | Creates a new named group or replaces the users in an existing group |
| 6      | GL (Group List)                 | <b>GL &lt;group name&gt;</b>   | Lists the members of a previously created group                      |
| 7      | GD (Group Delete)               | <b>GD &lt;group name&gt;</b>   | Deletes a previously created group                                   |
| 8      | IC (Dynamic Instant Conference) | <b>IC &lt;nick name OR phone OR group name #1&gt;...&lt;nick name OR phone OR group name #N&gt;</b>                                | Launches an ad hoc IC  |

|    |                                    |  |   |
|----|------------------------------------|--|---|
| 9  | CCx (Create Conference 'x')        | <b>CCx &lt;nick name OR phone OR group name #1&gt;...&lt;nick name OR phone OR group name #N&gt;</b>   | CCx creates or redefines the Xth IC       |
| 10 | ICx (Instant Conference 'x')       | <b>IC x</b>  | Launches IC number 'x'                    |
| 11 | LCx (list conference 'x')          | <b>LC x</b>  | Lists users associated with IC number 'x' |
| 12 | "??" or "?" or HELP command (Help) | <b>Syntax 1: ?? &lt;cmd&gt;</b><br><b>Syntax 2: ? &lt;cmd&gt;</b><br><b>Syntax 3: HELP &lt;cmd&gt;</b> | Shows help information                    |

## APPENDIX B - INSTANT-CONFERENCING SERVICE SUBSCRIBER

### WEB PORTAL

Each subscriber who signs up for the Instant Conference service is given access to a web portal for setting up his/her users, groups and one or more Instant Conferences. This portal augments the commands, capabilities that are available via the SMS interface. The portal is made secure by using HTTPS based access. Subscribers can use this portal to add/delete/edit user, groups and Instant conferences to their accounts. The portal also provides FAQs and training videos that help a subscriber learn the use of the service quickly.

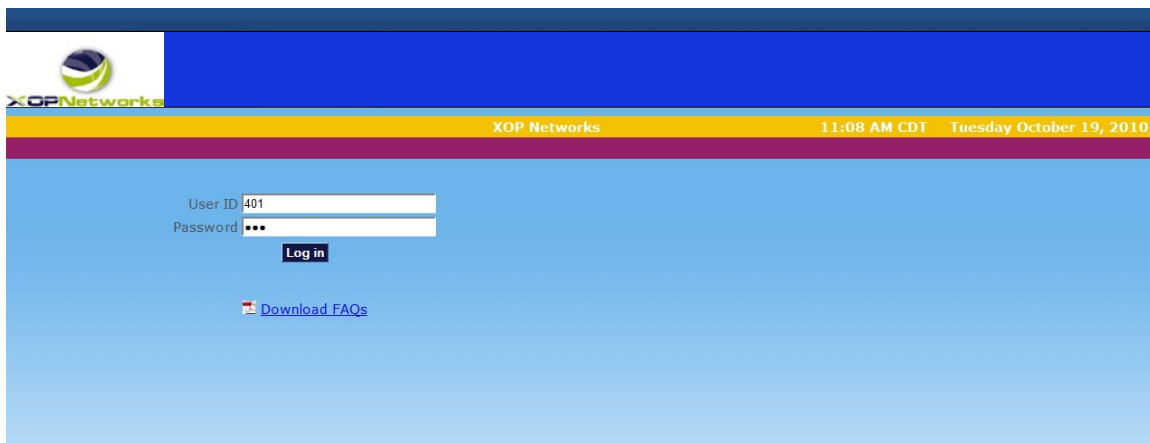


Figure A1: Instant Conference Subscriber Web Portal

An Instant Conference subscriber will be able to go to a URL (e.g. [www.InstantConference.com](http://www.InstantConference.com)) and log in using the login credentials provided by the Mobile Service Provider.

After login a subscriber will see the home page as shown in Figure A2. A subscriber can click on a link on the left hand column or click on the corresponding icon on the right to access different parts of the portal.



Figure A2: Instant Conference Home Page

A subscriber can click on ‘User’ link to set up subscriber’s Instant Conference ‘users’. These ‘users’ can be business associates, co-workers or friends or family members.

The screenshot shows the 'Instant Conferences' section of the user interface. On the left is a navigation menu with links: Home, Users, Groups, Instant Conferences (highlighted), Realview, Reports, Change Password, FAQs, Video Tutorials, and Log out. The main content area is titled 'Add User' and contains the following form fields:

- First Name:
- Middle Name:  *At least one of "First name" and "Last name" is required.*
- Last Name:
- Nick name:  (optional)
- Phone:  *A phone number is required with a maximum of 10 digits.*

At the bottom of the form are two buttons: 'Submit' and 'Cancel'. The top of the page features a header with the XOP Networks logo, 'Login ID: 401', 'XOP Networks', '11:23 AM CDT', and 'Tuesday October 19, 2010', along with a 'Help' link.

Figure A3: User Set up Page

The screenshot shows the 'Defined Users' section of the user interface. On the left is the same navigation menu as in Figure A3. The main content area is titled 'Defined Users' and includes an 'Add' button and a 'Delete' button. Below these is a table listing the defined users:

| No. | Nickname | User Name                       | Group Membership     | Delete                   |
|-----|----------|---------------------------------|----------------------|--------------------------|
| 1   |          | <a href="#">111222</a>          | <a href="#">Edit</a> | <input type="checkbox"/> |
| 2   |          | <a href="#">lance_desk</a>      | <a href="#">Edit</a> | <input type="checkbox"/> |
| 3   | long     | <a href="#">long</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 4   | u2       | <a href="#">u402</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 5   | u3       | <a href="#">u403</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 6   |          | <a href="#">u404</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 7   |          | <a href="#">u405</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 8   |          | <a href="#">user</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 9   |          | <a href="#">zzzz</a>            | <a href="#">Edit</a> | <input type="checkbox"/> |
| 10  |          | <a href="#">Fred Flintstone</a> | <a href="#">Edit</a> | <input type="checkbox"/> |
| 11  |          | <a href="#">qqqqqqq_mmm</a>     | <a href="#">Edit</a> | <input type="checkbox"/> |

The top of the page features a header with the XOP Networks logo, 'Login ID: 401', 'XOP Networks', '11:26 AM CDT', and 'Tuesday October 19, 2010', along with a 'Help' link.

Figure A4: List of Users

A subscriber can place users in one or more Groups. The Groups facility makes it convenient for a subscriber to launch Instant Conference with the group members.

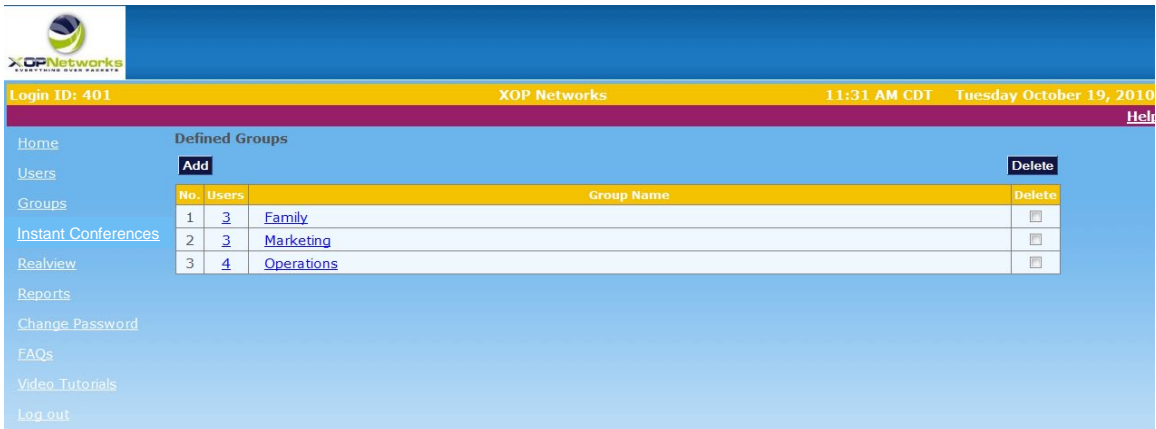


Figure A5: List of Groups

After a subscriber has created users and placed them into groups, he/she is ready to set up Instant Conferences.

Each subscriber can have up to 30 different Instant Conferences.

Figure A6 shows the Instant Conference set up page. A subscriber can pick users for a particular Instant Conference from a 1) List of Users, 2) List of Groups and 3) add them in Add-hoc fashion. A subscriber can add up to 10 Ad-hoc users.

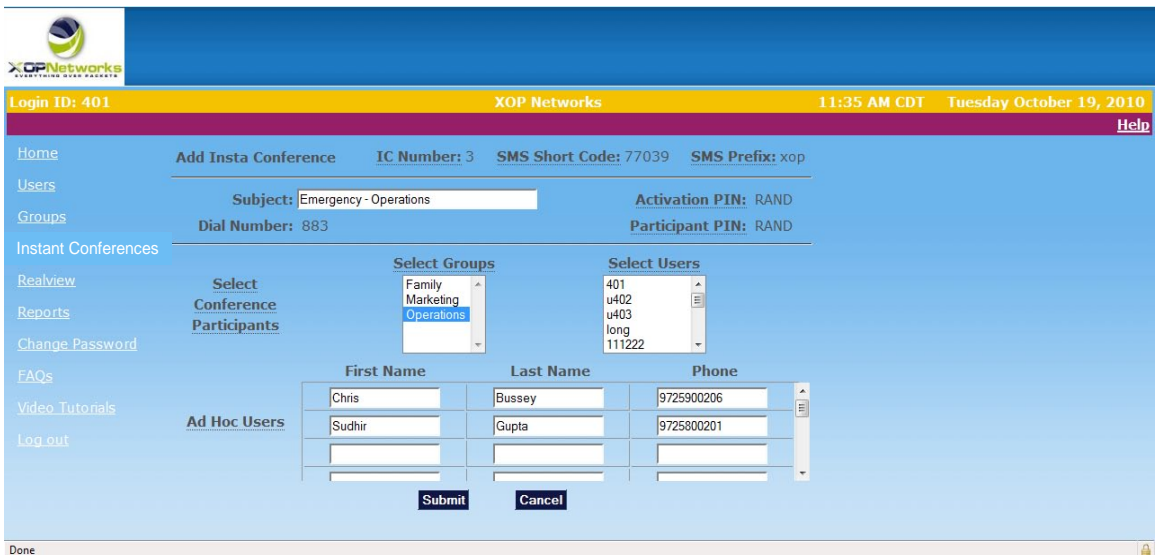


Figure A6: Adding an Instant-Conference

After an Instant Conference is saved, it gets added to the list of Instant Conferences as shown in Figure A7.

| IC Nbr. | Users | Subject                                | Dial Nbr. | Act PIN | User PIN | Status          | Delete                   |
|---------|-------|--|-----------|---------|----------|-----------------|--------------------------|
| 1       | 3     | <a href="#">ic1</a>                    | 881       | 7719298 | 0404253  | Actively used   | <input type="checkbox"/> |
| 2       | 3     | <a href="#">ic2</a>                    | 882       | 2958495 | 5473757  | Actively used   | <input type="checkbox"/> |
| 3       | 6     | <a href="#">Emergency - Operations</a> | 883       | 7218392 | 7523724  | Never activated | <input type="checkbox"/> |

Figure A7: List of Instant-Conferences

Each Instant Conference is assigned a DNIS automatically. This number is one of the 30 DNIS numbers that are assigned to the Instant Conference service. As these numbers are unique to a given subscriber's account, a subscriber can have up to 30 Instant Conferences in his/her account.

Each Instant Conference is assigned two PINs automatically. These PINs can be up to 7 digits in length. The Activation PIN is used to activate an Instant Conference. The User PIN is used by recipients to dial back into the bridge and re-join the ongoing conference in case their phone connection is dropped for any reason.

### *Want to Learn More?*

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

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#### **About XOP Networks**

Headquartered in Dallas, Texas, XOP Networks was founded in 2002 and is backed by a seasoned management team. Deployed at multiple Fortune 100 companies, US defense organizations, Mobile operators and CLEC/IOC customers, XOP Networks' products allow customers to improve employee productivity, promote business continuity and generate new revenue streams. Having both legacy and VoIP interfaces, XOP products allow customers to seamlessly transition their value added services from legacy circuit switched networks to VoIP based packet switched networks.

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