

Application Notes

Grandstream GXV3000 VCX v7.1.11c and 7.2.56.56

Issue: Revision 1.2

Date: June 21, 2007

Abstract: These application notes describe the configuration procedures required to use the Grandstream GXV3000 3-line SIP video phone. The GXV3000 is based on SIP and H.264/H.263+ standard, and combines sleek design and technology features with excellent picture quality, superior audio, multiple lines, advanced telephony feature set, and ease of deployment. The phone allows nearly all viewing angles via its 5.6 inch adjustable LCD screen and VGA resolution camera, enabling high-quality videoconferences over public Internet.

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Revision History

Revision	Date	Author	Reason for change
1.0	25 Apr 07	Marianne Rocco & Soumil Vora	Initial revision
1.1	7 June 07	Marianne Rocco, Soumil Vora, & Greg Dunlap	Added tested observations
1.2	21 June 07	Bob Blair	Formatting, 3Com Details

References

Date	Document Name	Revision	Company
25 Apr 07	GXV3000 User's Manual GXV3000 Release Notes		Grandstream Networks

Objective

Configure the Grandstream Enterprise SIP video phone (GXV3000) for use with the 3COM VCX 7210 IP Call Processor.

Grandstream Networks Company and Product Details

Grandstream Networks is a leading designer and manufacturer of innovative, affordable, and high quality IP voice and video products for the worldwide broadband telephony market. Our products are fully compatible with the SIP industry standard, field proven with large and rapidly growing deployed base, and have broad interoperability with the majority of 3rd party SIP products on the market today.

The Grandstream IP voice & video products offer the best price-performance point in the industry. Each is based on SIP standard and is feature rich – supporting both traditional and advanced features support a broad range of voice codecs, and are easy to manage and deploy through web-based GUI interfaces.

Grandstream continues to bring innovation to the IP communications market with exciting products of compelling values and differentiations. Grandstream Networks is headquartered in Brookline, Massachusetts with offices in Dallas, Los Angeles and Shenzhen/China.

GXV Key Features in a Glance

Open Standards Compatible	SIP 2.0, TCP/IP/UDP, RTP/RTCP, HTTP/HTTPS, ARP/RARP, ICMP, DNS (A record and SRV), DHCP, PPPoE, TFTP, NTP.
Network Interfaces	Dual 10/100mbps Ethernet ports, 2 USB (2.0) host ports, 2.5mm headset jack.
Superb Audio Quality	Advanced Digital Signal Processing (DSP), Silence suppression, VAD, CNG, AEC, AGC.
Superb Video Quality	Supports H.263 and H.264 (baseline) real-time video codec with video bandwidth from 32kbps – 1Mbps.
Advanced Video features	5.6in TFT color LCD, 180 degrees vertical rotation, 300 degrees horizontal rotation, advanced VGA resolution CMOS camera sensor, auto focus and exposure, auto zoom, camera block, PIP, still picture capture/store.
Feature Rich	Traditional voice features including caller ID, call waiting, hold, transfer, forward, block, mute, autodial, off-hook dial, and click to dial.
Advanced Functionality	Multi-line support, multi-party conferencing, headset enabled, intercom, AES encryption.

GXV-3000 Technical Specifications

Lines	3 individual SIP accounts; 3 line buttons
Protocol Support	Support SIP 2.0, TCP/UDP/IP, PPPoE, RTP/RTCP, SRTP by SDES, HTTP, ARP/RARP, ICMP, DNS, DHCP, NTP/SNTP, TFTP.
Display	12-digit caller ID 5.6in TFT color LCD
Feature Keys	8 dedicated keys: Message Button, Hold, Transfer, Conference, Speakerphone, Send, Mute/Del, Camera Block 5 display/menu navigation keys
Network Interface	Dual (2) 10/100 auto-sensing Ethernet ports (switched) Support 2 USB (2.0) host ports, 1 audio and 1 video output jack (capable of outputting video to an external TV simultaneously), headset jack
Device Management	Support Layer 2 (IEEE 802.1p/Q tagging (VLAN) and Layer 3 QoS (DiffServ) Web interface or via secure (AES encrypted) central configuration file for mass deployment, Keypad & adjustable 5.6 inch TFTP color LCD, Auto/manual provisioning system. GUI Interface, Address Book, Remote software upgrade (via TFTP/HTTP) for deployed devices including behind firewall/NAT
Provisioning	Support automated NAT traversal without manual manipulation of firewall/NAT Support remote automated and secure provisioning and software upgrade through firewall/NAT to enable “zero configuration” and “plug-and-dial” for end users. Support remote device monitoring and events reporting using Syslog Support device configuration via LCD, Web browser or central secure configuration file Support NAT traversal using IETF STUN and Symmetric RTP Manual or dynamic host configuration protocol (DHCP) network setup
Video Features	Powerful video DSP with advanced adaptive jitter control and packet loss concealment technology to ensure superb audio and video quality Support H.263/H.263+ and H.264 (baseline) real-time video codec (at CIF or QVGA resolution and up to 30 frames/second) to ensure highest quality video delivery at 32kbps -- 1Mbps bandwidth level (bit rate and frame rate configurable) High quality 5.6-inch TFTP color LCD (allowing 2-dimensional view angle adjustment including 180 degrees vertical rotation and nearly 300 degrees horizontal rotation) Advanced VGA resolution CMOS camera sensor (view angle adjustable) Anti-flickering, auto focus and auto exposure, zoom, PIP (Picture-in-Picture), audio mute and camera block (for privacy), call log, video phone book. Intuitive graphic user interface enabled by 5 navigation buttons. Configurable screen-saver pictures, still picture capture/store (VGA resolution), visual voice message indicator
Audio Features	Full-duplex hands-free speakerphone, Advanced Digital Signal Processing (DSP) Support for G.723.1, G.729A/B, G.711 μ A, G.726, GSM, G.722 (wide-band) with dynamic negotiation of codec and packet time In-band and out-of-band DTMF (In Audio, RFC2833, SIP INFO) Silence Suppression, VAD (voice activity detection), CNG (comfort noise generation), AGC (automatic gain control), Packet delay & loss concealment Acoustic Echo Cancellation (AEC) with Acoustic Gain Control (AGC) for speakerphone mode, Support sidetone, Adaptive jitter buffer control (patent-pending)
Call Handling Features	Call hold, call transfer (attended/blind), Do-Not-Disturb(DND), call forward (no answer, busy, unconditional), mute, caller ID/name display or block, call waiting, call waiting caller ID, 3-way conferencing, redial, dial plans, off-hook auto dial, auto answer, early dial, speed dial, call log, and volume control, Visual voice mail indicator, audio mute & camera block (for privacy), downloadable custom ring-tones

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	Support for anonymous call using privacy header
Firmware Upgrades	Support for Authenticating configuration file before accepting changes; Support firmware upgrade via TFTP or HTTP, Allow user to specify different URL for configuration file and firmware files
Advanced Server Features	Support DNS SRV Look up and SIP Server Fail Over, Visual message waiting indication, Support customizable idle screensaver
Security	DIGEST authentication and encryption using MD5 and MD5-sess Secure signaling (SIP over TLS, pending) and secure voice/video communication (SRTP).

- Datasheet
<http://www.grandstream.com/gxv3000.html>
- Features, Functions, and Benefits
<http://www.grandstream.com/gxv3000.html>

Grandstream Networks Overview

Grandstream Networks is a leading designer and manufacturer of innovative, affordable, and high quality IP voice and video products for the worldwide broadband telephony market. Our products are fully compatible with the SIP industry standard, field proven with large and rapidly growing deployed base, and have broad interoperability with the majority of 3rd party SIP products. Grandstream is consistently recognized in the VoIP industry for their innovation, affordability and one of the best performance-price points in the industry. They are ideal for either the Consumer or Enterprise VoIP market.

The Grandstream product portfolio includes Consumer ATAs and IP Phones, Enterprise Multi-line SIP phones (PoE powered), Enterprise Analog FXO/FXS Gateways, and IP Video Phones. For more information, please visit www.grandstream.com. Grandstream Networks is headquartered in Brookline, Massachusetts with offices in Dallas, Los Angeles and Shenzhen/China.

Configuration Technical Details

Grandstream Enterprise SIP Phones are standards-compliant SIP phones which are interoperable with most 3rd party SIP platforms, service providers, and traditional and IP-PBXs. The GXV3000 interoperates easily with the 3Com VCX platform.

How it Works

Grandstream Enterprise SIP Phones require an TFTP, FTP or an HTTP server to download firmware and configuration files. All configuration and provisioning information is detailed in these files. The standard web-GUI interface for each model guides the end-user through individual line configuration and basic / advanced set-up requirements.

Hardware Revisions

- Grandstream HV 1.1
- VCX V7000 IBM 306m Platform
- VCX Series i IBM 520 Server Platform
- 3102B Hard Phones
- 3COM PRI Digital Gateway V7122
- 3COM 5500G-EI Gigabit Ethernet Switch
- 3COM IP Telecommuting Module V7005

Software Revisions

- Grandstream Firmware 1.0.1.12
- VCX v7.1.11c
- VCX 7.2.56.56 with IBM i5R4 O.S.
- Convergence Client v2.4 App3.1 Client-9
- 3COM OS v3.03.00s168c03 5500G Firmware
- 3CTM v4.4.3

Installation Overview

Installation of Grandstream phones requires configuring the 3COM platform for additional phone lines/users, creating user-specific Grandstream configuration files, and provisioning the Grandstream phones with appropriate Grandstream config files.

Network Topology

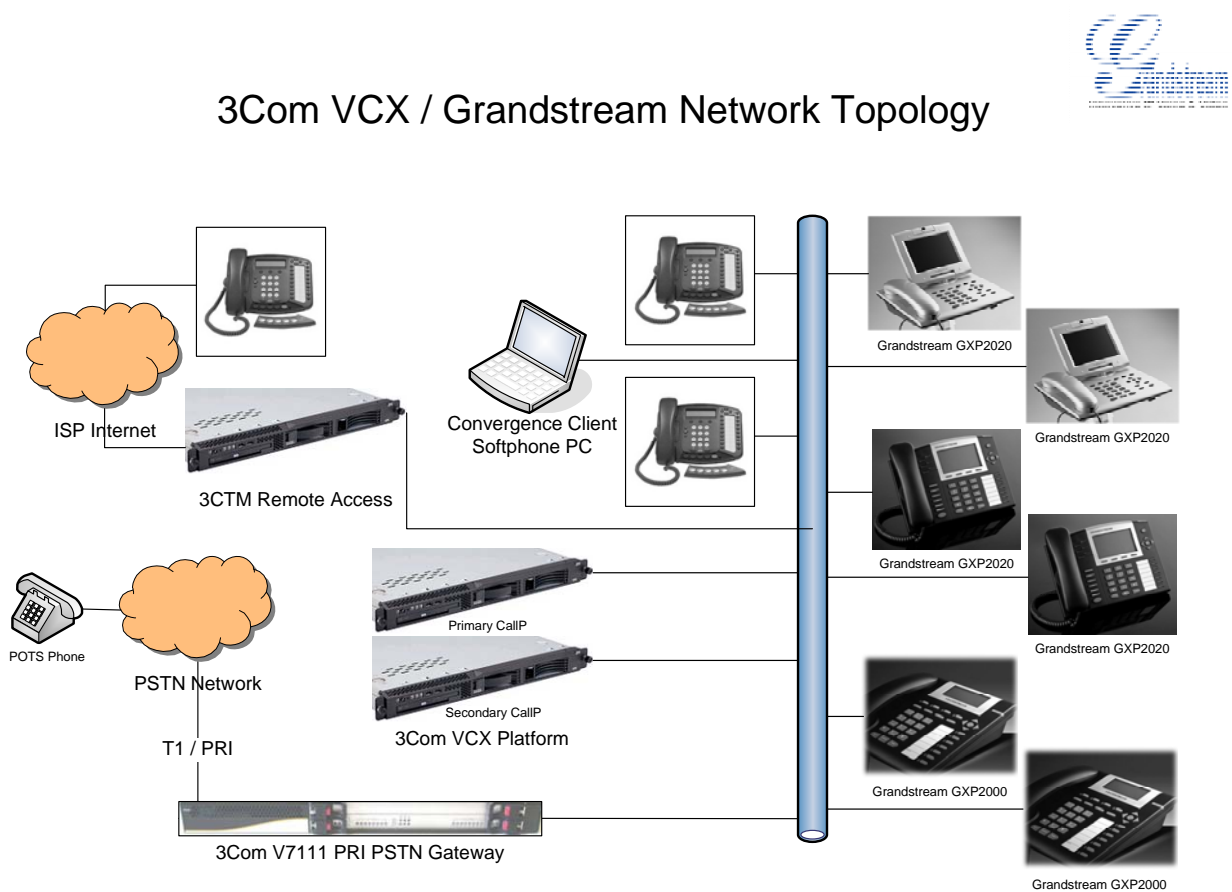


Figure 1: Network Topology

Basic Setup

- The setup included 2 GXV 3000 Video IP phones configured with static IPs powered by external Power Supplies.
- User accounts registering to the 3COM VCX system were created for each phone.
Each phone extension had a unique user created and extension associated to the user. No special settings were needed for these users and extensions.
- PCs on the same network were used to remotely configure the phones as well as capture network traces for analysis and troubleshooting.
Standard Windows XP O.S. and Linux PCs were available on the network to perform Web Based configuration of the phones, monitoring via a mirror port traffic with Wireshark, and for Convergence Client calls.

3COM Configuration Details

The 5500G switch configuration is presented below. The VLAN id 2 was used as the vlan for the phone testing. The default qos-profile was used. By adding the Grandstream Mac Address ranges into the switch configuration as a rule we can be sure that the Grandstream VoIP traffic is handled appropriately. To do this we added a new rule between rules 7 and 8 of the default switch configuration.

The following data is a subset of the complete switch configuration as tested.

```
#
# poe legacy enable
#
# igmp-snooping enable
#
# multicast routing-enable
#
acl number 3997
rule 0 permit IP dscp ef
rule 1 permit TCP destination-port eq www
rule 2 permit UDP destination-port eq snmp
rule 3 permit UDP destination-port eq snmptrap
rule 4 permit IP dscp cs6
rule 5 permit IP dscp cs7
#
acl number 4999
rule 0 permit type 8868 ffff
rule 1 permit source 00e0-bb00-0000 ffff-ff00-0000
rule 2 permit source 0003-6b00-0000 ffff-ff00-0000
rule 3 permit source 00e0-7500-0000 ffff-ff00-0000
rule 4 permit source 00d0-1e00-0000 ffff-ff00-0000
rule 5 permit source 0001-e300-0000 ffff-ff00-0000
rule 6 permit source 000f-e200-0000 ffff-ff00-0000
rule 7 permit source 0006-b900-0000 ffff-ff00-0000
rule 8 permit source 0008-b200-0000 ffff-ff00-0000 ← Grandstream MAC entry
rule 9 deny dest 0000-0000-0000 ffff-ffff-ffff ← Original rule 8 edited to be rule 9
#
qos-profile default
packet-filter inbound link-group 4999 rule 9 ← Changed rule 8 to rule 9
traffic-priority inbound ip-group 3997 rule 0 cos voice
traffic-priority inbound ip-group 3997 rule 4 cos network-management
traffic-priority inbound ip-group 3997 rule 5 cos network-management
traffic-priority inbound link-group 4999 rule 0 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 1 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 2 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 3 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 4 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 5 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 6 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 7 dscp ef cos voice
traffic-priority inbound link-group 4999 rule 8 dscp ef cos voice ← New rule 8
#
#
interface GigabitEthernet1/0/1
poe enable ← We must turn on Power of Ethernet
broadcast-suppression pps 3000
port access vlan 2 ← Port is associated to Vlan id 2
apply qos-profile default ← QOS profile definition
```

Configuration Details

- Phones were by default configured to DHCP. Using remote HTTP access on the PC, the web configuration screen was accessed at the IP address shown on phone LCD display.



- By default the administrator login password is admin. Upon logging in, **ADVANCED SETTINGS** page is viewed. Besides it, there are **STATUS**, **BASIC SETTINGS**, and the **ACCOUNT 1-3** pages

Grandstream Device Configuration	
STATUS	BASIC SETTINGS
Admin Password:	<input type="text"/> (purposely not displayed for security protection)
G723 rate:	<input checked="" type="radio"/> 6.3kbps encoding rate <input type="radio"/> 5.3kbps encoding rate
Silence Suppression:	<input checked="" type="radio"/> No <input type="radio"/> Yes
Voice Frames per TX:	<input type="text" value="2"/> (up to 10/20/32/64 for G711/G726/G723/other codecs respectively)
Video frame rate:	<input type="text" value="30 frames/second"/>
Video bit rate (kbps):	<input type="text" value="256 kbps"/>
Video Packet Size:	<input type="text" value="1400"/> (from 300 to 1400, default is 1400)
Video Rate Control:	<input checked="" type="radio"/> Frame <input type="radio"/> TMNS
Video Frame Skipping:	<input checked="" type="radio"/> No <input type="radio"/> Yes
Sharpening Filter:	<input type="text" value="5"/> (0-9, 0 means disabled, default is 5)
Brightening Filter:	<input type="text" value="5"/> (0-9, 0 means disabled, default is 5)
Enable Video Surveillance:	<input checked="" type="radio"/> No <input type="radio"/> Yes
RTSP port:	<input type="text" value="554"/> (default is 554)
Layer 3 QoS:	<input type="text" value="0"/> (Diff-Serv or Precedence value)
Layer 2 QoS:	802.1Q VLAN Tag <input type="text" value="0"/> 802.1p priority value <input type="text" value="0"/> (0-7)
No Key Entry Timeout:	<input type="text" value="4"/> (in seconds, default is 4 seconds)
Use # as Dial Key:	<input type="radio"/> No <input checked="" type="radio"/> Yes (if set to Yes, "#" will function as the "(Re-)Dial" key)
local RTP port:	<input type="text" value="5004"/> (1024-65535, default 5004)
Use random port:	<input checked="" type="radio"/> No <input type="radio"/> Yes

- For testing basic calls this page was kept to default settings. However, for testing VLAN capabilities we later configured Layer 2 QoS settings as seen above. Apply the appropriate L2 and L3 QoS values to match the network infrastructure. 3COM Voice products default to using Layer 3 QoS DSCP of 46.

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keep-alive interval: (in seconds, default 20 seconds)

Use NAT IP (if specified, this will be used in SIP/SDP message)

STUN server: (URI or IP:port)

Firmware Upgrade and Provisioning: Upgrade Via TFTP HTTP

Firmware Server Path:

Config Server Path:

Firmware File Prefix:

Firmware File Postfix:

Config File Prefix:

Config File Postfix:

Allow DHCP Option 66 to override server:
 No Yes

Automatic Upgrade:
 No Yes, check for upgrade every minutes (default 7 days)

Always Check for New Firmware
 Check New Firmware only when F/W pre/suffix changes
 Always Skip the Firmware Check

Authenticate Conf File:
 No Yes (cfg file would be authenticated before acceptance if set to Yes)

Screen Saver Download: Enable Screen Saver Download:
 No YES, HTTP YES, TFTP

Screen Saver Server Path:

Phonebook XML Download: Enable Phonebook XML Download:
 No YES, HTTP YES, TFTP

Phonebook XML Server Path:

Remove Manually-edited entries on Download:
 No Yes

DTMF Payload Type:

Syslog Server:

Syslog Level: ▼

NTP Server: (URI or IP address)

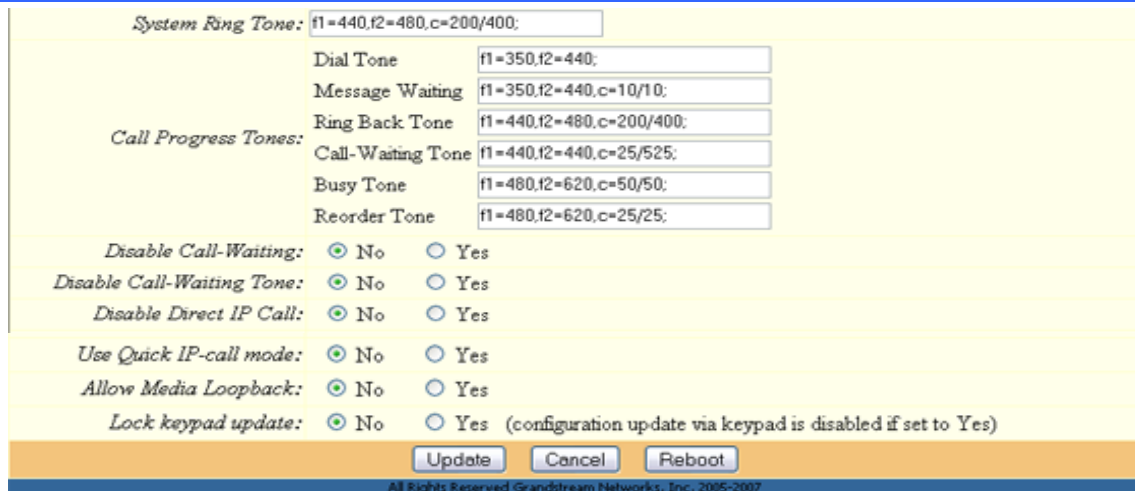
Allow DHCP Option 42 to override NTP server:
 No Yes

Distinctive Ring Tone: Custom ring tone 1, used if incoming caller ID is

Custom ring tone 2, used if incoming caller ID is

Custom ring tone 3, used if incoming caller ID is

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System Ring Tone: f1=440,f2=480,c=200/400;

Dial Tone: f1=350,f2=440;

Message Waiting: f1=350,f2=440,c=10/10;

Ring Back Tone: f1=440,f2=480,c=200/400;

Call-Progress Tones:

Call-Waiting Tone: f1=440,f2=440,c=25/525;

Busy Tone: f1=480,f2=620,c=50/50;

Reorder Tone: f1=480,f2=620,c=25/25;

Disable Call-Waiting: No Yes

Disable Call-Waiting Tone: No Yes

Disable Direct IP Call: No Yes

Use Quick IP-call mode: No Yes

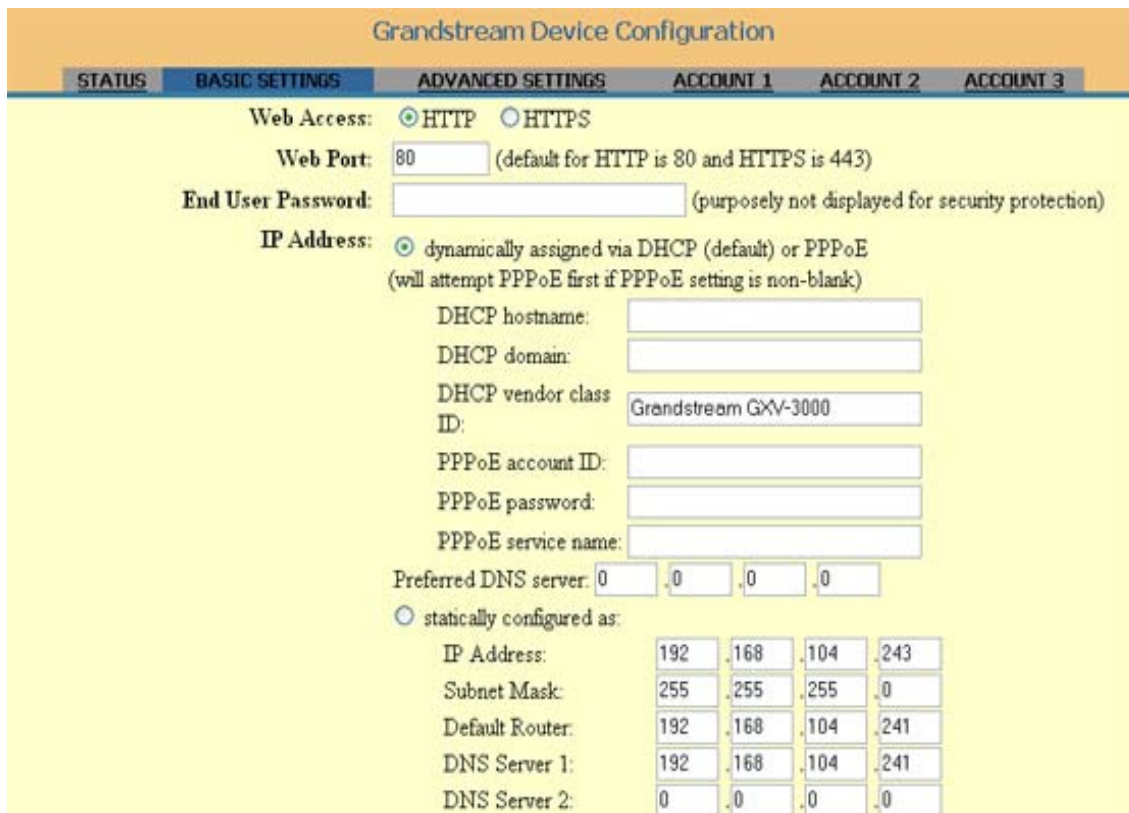
Allow Media Loopback: No Yes

Lock keypad update: No Yes (configuration update via keypad is disabled if set to Yes)

Update Cancel Reboot

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- In order to configure Static IPs click on **BASIC SETTINGS** tab (at the top).



Grandstream Device Configuration

STATUS BASIC SETTINGS ADVANCED SETTINGS ACCOUNT 1 ACCOUNT 2 ACCOUNT 3

Web Access: HTTP HTTPS

Web Port: 80 (default for HTTP is 80 and HTTPS is 443)

End User Password: (purposely not displayed for security protection)

IP Address: dynamically assigned via DHCP (default) or PPPoE
(will attempt PPPoE first if PPPoE setting is non-blank)

DHCP hostname:

DHCP domain:

DHCP vendor class ID: Grandstream GXV-3000

PPPoE account ID:

PPPoE password:

PPPoE service name:

Preferred DNS server: 0 .0 .0 .0

statically configured as:

IP Address: 192 .168 .104 .243

Subnet Mask: 255 .255 .255 .0

Default Router: 192 .168 .104 .241

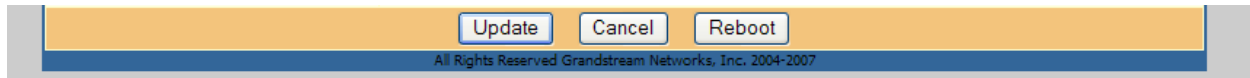
DNS Server 1: 192 .168 .104 .241

DNS Server 2: 0 .0 .0 .0

- As you can see by default it is set to DHCP. Click on the '**statically configured as**' radio button and enter the appropriate Static IP information.

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- After entering this information, click on the **UPDATE BUTTON** at the bottom to save the changes.



- Upon clicking **UPDATE**, the following screen will be viewed.



- Now, click on **ACCOUNT 1** tab to configure the user account, created on the 3COM VCX.

Enter the appropriate information as shown below:

VCX Primary Call Processor IP: 192.168.104.204	← VCX Primary
Phone Extension: 343	← Phone Extension
Phone Password: 12345	← Phone Password

192.168.104.204 is the IP Address of the VCX Call Processor as given by 3COM. The User account for this phone is 343 and password 12345 (hidden) was entered under **Authenticate Password**.

The **Account Name** and **Name** are optional fields and can be set as per user.

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Grandstream Device Configuration	
STATUS	BASIC SETTINGS
<p>Account Active: <input type="radio"/> No <input checked="" type="radio"/> Yes</p> <p>Account Name: <input type="text"/> (e.g., MyCompany)</p> <p>SIP Server: <input type="text" value="192.168.104.204"/> (e.g., sip.mycompany.com, or IP address)</p> <p>Outbound Proxy: <input type="text"/> (e.g., proxy.myprovider.com, or IP address, if any)</p> <p>SIP User ID: <input type="text" value="343"/> (the user part of an SIP address)</p> <p>Authenticate ID: <input type="text" value="343"/> (can be identical to or different from SIP User ID)</p> <p>Authenticate Password: <input type="text"/> (purposely not displayed for security protection)</p> <p>Name: <input type="text" value="343"/> (optional, e.g., John Doe)</p> <p>Use DNS SRV: <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>User ID is phone number: <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>SIP Registration: <input type="radio"/> No <input checked="" type="radio"/> Yes</p> <p>Unregister On Reboot: <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Register Expiration: <input type="text" value="60"/> (in minutes. default 1 hour, max 45 days)</p> <p>Registration Retry Wait Time: <input type="text" value="20"/> (in seconds. Between 1-3600, default is 20)</p> <p>Local SIP port: <input type="text" value="5060"/> (default 5060)</p> <p>NAT Traversal (STUN): <input checked="" type="radio"/> No <input type="radio"/> No, but send keep-alive <input type="radio"/> Yes</p> <p>SUBSCRIBE for MWI: <input type="radio"/> No <input checked="" type="radio"/> Yes</p> <p>Proxy-Require: <input type="text"/></p>	

- Set **Subscribe to MWI (See Above)** to **Yes** to allow voice mail notifications from the VCX. **Send DTMF** can be set to either selection, we set it to **via RTP (RFC2833)**.

Send DTMF:	<input type="checkbox"/> in-audio	<input checked="" type="checkbox"/> via RTP (RFC2833)	<input type="checkbox"/> via SIP INFO
Early Dial:	<input checked="" type="radio"/> No	<input type="radio"/> Yes (use "Yes" only if proxy supports 484 response)	
Dial Plan Prefix:	<input type="text"/>	(this prefix string is added to each dialed number)	
Dial Plan:	<input style="width: 100%;" type="text" value="{x*}"/>		
Delayed Call Forward Wait Time:	<input type="text" value="20"/>	(Allowed range 1-120, in seconds.)	
Enable Call Features:	<input type="radio"/> No	<input checked="" type="radio"/> Yes (if Yes, star codes will be supported locally)	

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- You may change the preferred codec used for calls. By default all codecs will be available in the order seen below. You may select all choices to a single codec if you want to force usage of only that codec. Once again, after entering all information, click on **UPDATE** at the bottom to save the changes.

<i>Preferred Vocoder: (in listed order)</i>	choice 1: PCMU ▼	choice 5: G.729A/B ▼
	choice 2: G.723.1 ▼	choice 6: PCMA ▼
	choice 3: GSM ▼	choice 7: G.726-32 ▼
	choice 4: G.729A/B ▼	choice 8: G.729A/B ▼
<i>Preferred Video Coder: (in listed order)</i>	choice 1: H.264 ▼	choice 2: H.263 ▼
<i>Jitter Delay:</i>	Medium ▼	
<i>Enable Video:</i>	<input type="radio"/> No <input checked="" type="radio"/> Yes	
<i>H.264 payload type:</i>	99 (between 96 and 127, default is 99)	
<i>SRTP Mode:</i>	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled but not forced <input type="radio"/> Enabled and forced	
<i>Special Feature:</i>	Standard ▼	
<input type="button" value="Update"/> <input type="button" value="Cancel"/> <input type="button" value="Reboot"/>		
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Testing Observations

All of the basic and star code VCX features worked seamlessly in our tests with the GXV 3000. The only failed features were those not currently supported by VCX.

Verification Tests

Not all VCX supported features will be available to users through Grandstream phones and vice versa.

Note: The support for Primary and Secondary VCX is not available. These phones only maintain registrations with the primary VCX.

The features that were shown to operate properly are as follows:

- Basic IP Calls
- Basic IP - PSTN gateway calls
- Call Conference
- Call Hold
- Call Transfer (Blind)
- Call Transfer (Attended)
- Call Waiting
- Caller ID
- Do Not Disturb
- Last Number Redial
- Message Waiting Indication
- Missed Call Indicator
- Mute
- Speed Dial
- Calls to/from 3Com 3102 stations
- Convergence Client: Audio and Video @56Kbps to T1/LAN: QCIF to CIF at 5 to 30 fps
- Multi-Way conference calls
- Interoperability with VCX 3CTM

The following tests passed but required using *XXX codes.

- Automatic Call Back (Camp On).
- Call Forward All
- Call Forward Busy
- Call Forward No answer
- Call Park/Retrieve
- Caller ID Block

Troubleshooting Tips

Basic troubleshooting technique should suffice for this solution. The integration was very simple and intuitive for a VoIP user/technician.

1. Simply Ping the phone's IP address from a client PC. This will test basic IP connectivity.
2. Double check the phone IP and SIP acct. settings for accuracy. Verify the correct IP network is assigned and default gateway is correct. Ping the default gateway to test for reachability from the client PC. Verify the extension and password are correct.
3. Verify phone registration.
 - a. On the VCX Admin screen navigate to the Phones screen, locate the phone extension associated to the phone and select the Registration link in the left side of the screen. This will report the phone's SIP registration. If its not present the phone is failing to register with the VCX. If it is present the registration is successful.
4. Perform a Wireshark trace of the phone registration.
 - a. Locate an Ethernet hub. Plug the phone line from the wall into the hub, a second Ethernet cable tot eh phone, and a PC running wireshark into the third port.
 - b. Start the capture. And initiate the registration. Use an external power supply to power the phone.
 - c. Compare the registration fields to the registration sample in Appendix A.
 - d. Alternatively a switch mirror group may be provisioned and include the VCX, and Phone port as members of the mirror group. The port the Client PC is connected to will be the monitor port.

Product Support

Product support can be obtained from the respective product suppliers.

3COM product support:

Main 3COM Support link:

http://www.3com.com/products/en_US/support/index.html

3COM Product Specific Link

http://www.3com.com/products/en_US/detail.jsp?pathtype=purchase&tab=features&sku=WEBBN GVCXV7000

Asia Pacific

Telephone: +65 6543 6645

Fax: +65 6543 6518

E-mail: ap_service@3com.com

Europe, Middle East and Africa

Telephone: +44 (0)1442 435529 (Option 4)

Fax : +44 (0)1442 435811

E-mail: focalpoint_services@3com.com

North America and Latin America

Telephone: 866-326-6222 (Option 3)

Fax : 408-326-7140

E-mail: ecso_contracts@3com.com

Grandstream Product Support:

<http://www.grandstream.com/gxv3000>

Grandstream Networks

Support Web page: <http://www.grandstream.com/customersupport.html>

Support:

617-566-9300 x2

support@grandstream.com

Conclusion

The GXV3000 had no major issues with the 3COM VCX. All major features can interface seamlessly with the GXV. The GXV3000 is a great Enterprise SIP Video Phone for users of the 3COM VCX 7210 IP Call Processor.

Appendix A: Phone Registration

```

Frame 1 (522 bytes on wire, 522 bytes captured)
  Arrival Time: May 30, 2007 10:56:49.355710000
  [Time delta from previous packet: 0.000000000 seconds]
  [Time since reference or first frame: 0.000000000 seconds]
  Frame Number: 1
  Packet Length: 522 bytes
  Capture Length: 522 bytes
  [Frame is marked: False]
  [Protocols in frame: eth:ip:udp:sip]
  [Coloring Rule Name: UDP]
  [Coloring Rule String: udp]
Ethernet II, Src: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6), Dst: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  Destination: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
      ....0... = IG bit: Individual address (unicast)
      ....0... = LG bit: Globally unique address (factory default)
  Source: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
      ....0... = IG bit: Individual address (unicast)
      ....0... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.242 (192.168.104.242), Dst: 192.168.104.204 (192.168.104.204)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
    0000 00.. = Differentiated Services Codepoint: Default (0x00)
    ....0.. = ECN-Capable Transport (ECT): 0
    ....0.. = ECN-CE: 0
  Total Length: 508
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
  Fragment offset: 0
  Time to live: 255
  Protocol: UDP (0x11)
  Header checksum: 0x26e1 [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.242 (192.168.104.242)
  Destination: 192.168.104.204 (192.168.104.204)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
  Length: 488
  Checksum: 0x02db [correct]
Session Initiation Protocol
  Request-Line: REGISTER sip:192.168.104.204 SIP/2.0
  Method: REGISTER
  [Resent Packet: False]
  Message Header
    Via: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK6b3176e56f24fc57
      Transport: UDP
      Sent-by Address: 192.168.104.242
      Sent-by port: 5060
      Branch: z9hG4bK6b3176e56f24fc57
    From: "342" <sip:342@192.168.104.204>;tag=4136ba777be12803
      SIP Display info: "342"
      SIP from address: sip:342@192.168.104.204
      SIP tag: 4136ba777be12803
    To: <sip:342@192.168.104.204>

```

Blue

```
SIP to address: sip:342@192.168.104.204
Contact: <sip:342@192.168.104.242:5060>
Contact Binding: <sip:342@192.168.104.242:5060>
URI: <sip:342@192.168.104.242:5060>
SIP contact address: sip:342@192.168.104.242:5060
Call-ID: e59616260130cc00@192.168.104.242
CSeq: 10001 REGISTER
Sequence Number: 10001
Method: REGISTER
Expires: 3600
User-Agent: Grandstream GXV3000 1.0.1.12
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,BYE,NOTIFY,REFER,OPTIONS,INFO,SUBSCRIBE,UPDATE,PRACK
Content-Length: 0
```

Frame 2 (320 bytes on wire, 320 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.355716000
[Time delta from previous packet: 0.000006000 seconds]
[Time since reference or first frame: 0.000006000 seconds]
Frame Number: 2
Packet Length: 320 bytes
Capture Length: 320 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
.... 0... = IG bit: Individual address (unicast)
.... .0... = LG bit: Globally unique address (factory default)
Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
.... 0... = IG bit: Individual address (unicast)
.... .0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
.... .0. = ECN-Capable Transport (ECT): 0
.... ...0 = ECN-CE: 0
Total Length: 306
Identification: 0x0000 (0)
Flags: 0x04 (Don't Fragment)
0... = Reserved bit: Not set
.1.. = Don't fragment: Set
..0. = More fragments: Not set
Fragment offset: 0
Time to live: 64
Protocol: UDP (0x11)
Header checksum: 0xe5f3 [correct]
[Good: True]
[Bad : False]
Source: 192.168.104.204 (192.168.104.204)
Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
Source port: 5060 (5060)
Destination port: 5060 (5060)
Length: 286
Checksum: 0xfe2b [correct]
Session Initiation Protocol
Status-Line: SIP/2.0 100 Trying
Status-Code: 100
```

Blue

```
[Resent Packet: False]
Message Header
v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK6b3176e56f24fc57
  Transport: UDP
  Sent-by Address: 192.168.104.242
  Sent-by port: 5060
  Branch: z9hG4bK6b3176e56f24fc57
f: "342"<sip:342@192.168.104.204>;tag=4136ba777bel2803
  SIP Display info: "342"
  SIP from address: sip:342@192.168.104.204
  SIP tag: 4136ba777bel2803
t: <sip:342@192.168.104.204>
  SIP to address: sip:342@192.168.104.204
i: e59616260130cc00@192.168.104.242
Cseq: 10001 REGISTER
  Sequence Number: 10001
  Method: REGISTER
Date: Wed, 30 May 2007 13:55:42 GMT
Content-Length: 0
```

Frame 3 (643 bytes on wire, 643 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.355720000
[Time delta from previous packet: 0.000004000 seconds]
[Time since reference or first frame: 0.000010000 seconds]
Frame Number: 3
Packet Length: 643 bytes
Capture Length: 643 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
      .... 0... = IG bit: Individual address (unicast)
      .... 0... = LG bit: Globally unique address (factory default)
  Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
      .... 0... = IG bit: Individual address (unicast)
      .... 0... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
    1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
      .... 0.. = ECN-Capable Transport (ECT): 0
      .... 0.. = ECN-CE: 0
  Total Length: 629
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    1.. = Don't fragment: Set
    ..0 = More fragments: Not set
  Fragment offset: 0
  Time to live: 64
  Protocol: UDP (0x11)
  Header checksum: 0xe4b0 [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.204 (192.168.104.204)
  Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
```

Blue

```

Length: 609
Checksum: 0xd8c5 [correct]
Session Initiation Protocol
Status-Line: SIP/2.0 401 Unauthorized
  Status-Code: 401
  [Resent Packet: False]
Message Header
  v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK6b3176e56f24fc57
    Transport: UDP
    Sent-by Address: 192.168.104.242
    Sent-by port: 5060
    Branch: z9hG4bK6b3176e56f24fc57
  f: "342"<sip:342@192.168.104.204>;tag=4136ba777bel2803
    SIP Display info: "342"
    SIP from address: sip:342@192.168.104.204
    SIP tag: 4136ba777bel2803
  t: <sip:342@192.168.104.204>;tag=81fc08c
    SIP to address: sip:342@192.168.104.204
    SIP tag: 81fc08c
  i: e59616260130cc00@192.168.104.242
Cseq: 10001 REGISTER
  Sequence Number: 10001
  Method: REGISTER
Date: Wed, 30 May 2007 13:55:42 GMT
Allow: INVITE,ACK,BYE,CANCEL,REFER,SUBSCRIBE,NOTIFY,UPDATE,OPTIONS,MESSAGE,FEATURE
Expires: 3600
User-Agent: 3Com VCX 7210 IP CallProcessor/v7.1.42
WWW-Authenticate: Digest realm="3Com", domain="3Com",
nonce="aLaLaSaKaPaNaNaNaOaMaUaLaTaMaIaLaQaSaIaLaKaOaIaMaOaMaUaPaKaQaK", stale=FALSE,
algorithm=MD5
  Authentication Scheme: Digest
  Realm: "3Com"
  Authentication Domain: "3Com"
  Nonce Value: "aLaLaSaKaPaNaNaNaOaMaUaLaTaMaIaLaQaSaIaLaKaOaIaMaOaMaUaPaKaQaK"
  Stale Flag: FALSE
  Algorithm: MD5
Content-Length: 0

```

Frame 4 (733 bytes on wire, 733 bytes captured)

```

Arrival Time: May 30, 2007 10:56:49.357186000
[Time delta from previous packet: 0.001466000 seconds]
[Time since reference or first frame: 0.001476000 seconds]
Frame Number: 4
Packet Length: 733 bytes
Capture Length: 733 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6), Dst: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  Destination: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
      ....0.0. .... = IG bit: Individual address (unicast)
      ....0.0. .... = LG bit: Globally unique address (factory default)
  Source: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
      ....0.0. .... = IG bit: Individual address (unicast)
      ....0.0. .... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.242 (192.168.104.242), Dst: 192.168.104.204 (192.168.104.204)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
  0000 00.. = Differentiated Services Codepoint: Default (0x00)
  ....0.0. = ECN-Capable Transport (ECT): 0

```

Blue

```
.... ..0 = ECN-CE: 0
Total Length: 719
Identification: 0x0001 (1)
Flags: 0x04 (Don't Fragment)
  0... = Reserved bit: Not set
  .1.. = Don't fragment: Set
  ..0. = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (0x11)
Header checksum: 0x260d [correct]
  [Good: True]
  [Bad : False]
Source: 192.168.104.242 (192.168.104.242)
Destination: 192.168.104.204 (192.168.104.204)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
Source port: 5060 (5060)
Destination port: 5060 (5060)
Length: 699
Checksum: 0xa867 [correct]
Session Initiation Protocol
Request-Line: REGISTER sip:192.168.104.204 SIP/2.0
Method: REGISTER
[Resent Packet: False]
Message Header
Via: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK7da6549381a765f0
Transport: UDP
Sent-by Address: 192.168.104.242
Sent-by port: 5060
Branch: z9hG4bK7da6549381a765f0
From: "342" <sip:342@192.168.104.204>;tag=4136ba777bel2803
SIP Display info: "342"
SIP from address: sip:342@192.168.104.204
SIP tag: 4136ba777bel2803
To: <sip:342@192.168.104.204>
SIP to address: sip:342@192.168.104.204
Contact: <sip:342@192.168.104.242:5060>
Contact Binding: <sip:342@192.168.104.242:5060>
URI: <sip:342@192.168.104.242:5060>
SIP contact address: sip:342@192.168.104.242:5060
Authorization: Digest username="342", realm="3Com", algorithm=MD5,
uri="sip:192.168.104.204",
nonce="aLaLaSaKaPaNaNaNaOaMaUaLaTaMaIaLaQaSaIaLaKaOaIaMaOaMaUaPaKaQaK",
response="05c73fbe890bc820f39adbe005abf410"
Authentication Scheme: Digest
Username: "342"
Realm: "3Com"
Algorithm: MD5
Authentication URI: "sip:192.168.104.204"
Nonce Value: "aLaLaSaKaPaNaNaNaOaMaUaLaTaMaIaLaQaSaIaLaKaOaIaMaOaMaUaPaKaQaK"
Digest Authentication Response: "05c73fbe890bc820f39adbe005abf410"
Call-ID: e59616260130cc00@192.168.104.242
CSeq: 10002 REGISTER
Sequence Number: 10002
Method: REGISTER
Expires: 3600
User-Agent: Grandstream GXV3000 1.0.1.12
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,BYE,NOTIFY,REFER,OPTIONS,INFO,SUBSCRIBE,UPDATE,PRACK
Content-Length: 0
```

Frame 5 (320 bytes on wire, 320 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.357915000
[Time delta from previous packet: 0.000729000 seconds]
[Time since reference or first frame: 0.002205000 seconds]
```

Blue

```
Frame Number: 5
Packet Length: 320 bytes
Capture Length: 320 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
.... 0.. = ECN-Capable Transport (ECT): 0
.... 0.. = ECN-CE: 0
Total Length: 306
Identification: 0x0000 (0)
Flags: 0x04 (Don't Fragment)
0... = Reserved bit: Not set
.1.. = Don't fragment: Set
..0. = More fragments: Not set
Fragment offset: 0
Time to live: 64
Protocol: UDP (0x11)
Header checksum: 0xe5f3 [correct]
[Good: True]
[Bad : False]
Source: 192.168.104.204 (192.168.104.204)
Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
Source port: 5060 (5060)
Destination port: 5060 (5060)
Length: 286
Checksum: 0xcb8e [correct]
Session Initiation Protocol
Status-Line: SIP/2.0 100 Trying
Status-Code: 100
[Resent Packet: False]
Message Header
v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK7da6549381a765f0
Transport: UDP
Sent-by Address: 192.168.104.242
Sent-by port: 5060
Branch: z9hG4bK7da6549381a765f0
f: "342"<sip:342@192.168.104.204>;tag=4136ba777be12803
SIP Display info: "342"
SIP from address: sip:342@192.168.104.204
SIP tag: 4136ba777be12803
t: <sip:342@192.168.104.204>
SIP to address: sip:342@192.168.104.204
i: e59616260130cc00@192.168.104.242
Cseq: 10002 REGISTER
Sequence Number: 10002
Method: REGISTER
Date: Wed, 30 May 2007 13:55:42 GMT
Content-Length: 0
```

Blue

```
Frame 6 (514 bytes on wire, 514 bytes captured)
  Arrival Time: May 30, 2007 10:56:49.408505000
  [Time delta from previous packet: 0.050590000 seconds]
  [Time since reference or first frame: 0.052795000 seconds]
  Frame Number: 6
  Packet Length: 514 bytes
  Capture Length: 514 bytes
  [Frame is marked: False]
  [Protocols in frame: eth:ip:udp:sip]
  [Coloring Rule Name: UDP]
  [Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    .... 0... = IG bit: Individual address (unicast)
    .... 0... = LG bit: Globally unique address (factory default)
  Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    .... 0... = IG bit: Individual address (unicast)
    .... 0... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
    1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
    .... 0.. = ECN-Capable Transport (ECT): 0
    .... 0.. = ECN-CE: 0
  Total Length: 500
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
  Fragment offset: 0
  Time to live: 64
  Protocol: UDP (0x11)
  Header checksum: 0xe531 [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.204 (192.168.104.204)
  Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
  Length: 480
  Checksum: 0xb291 [correct]
Session Initiation Protocol
  Status-Line: SIP/2.0 200 OK
  Status-Code: 200
  [Resent Packet: False]
  Message Header
    v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bK7da6549381a765f0
      Transport: UDP
      Sent-by Address: 192.168.104.242
      Sent-by port: 5060
      Branch: z9hG4bK7da6549381a765f0
    f: "342"<sip:342@192.168.104.204>;tag=4136ba777be12803
      SIP Display info: "342"
      SIP from address: sip:342@192.168.104.204
      SIP tag: 4136ba777be12803
    t: <sip:342@192.168.104.204>;tag=81fd1cc
      SIP to address: sip:342@192.168.104.204
      SIP tag: 81fd1cc
    i: e59616260130cc00@192.168.104.242
```

Blue

```
Cseq: 10002 REGISTER
  Sequence Number: 10002
  Method: REGISTER
Date: Wed, 30 May 2007 13:55:42 GMT
m: <sip:342@192.168.104.242:5060>
  Contact Binding: <sip:342@192.168.104.242:5060>
  URI: <sip:342@192.168.104.242:5060>
  SIP contact address: sip:342@192.168.104.242:5060
Allow: INVITE,ACK,BYE,CANCEL,REFER,SUBSCRIBE,NOTIFY,UPDATE,OPTIONS,MESSAGE,FEATURE
Expires: 3600
User-Agent: 3Com VCX 7210 IP CallProcessor/v7.1.42
Content-Length: 0
```

Frame 7 (649 bytes on wire, 649 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.409375000
[Time delta from previous packet: 0.000870000 seconds]
[Time since reference or first frame: 0.053665000 seconds]
Frame Number: 7
Packet Length: 649 bytes
Capture Length: 649 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
      ....0... = IG bit: Individual address (unicast)
      ....0... = LG bit: Globally unique address (factory default)
  Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
      ....0... = IG bit: Individual address (unicast)
      ....0... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
    1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
    ....0.. = ECN-Capable Transport (ECT): 0
    ....0.. = ECN-CE: 0
  Total Length: 635
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
  Fragment offset: 0
  Time to live: 64
  Protocol: UDP (0x11)
  Header checksum: 0xe4aa [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.204 (192.168.104.204)
  Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
  Length: 615
  Checksum: 0xc68a [correct]
Session Initiation Protocol
  Request-Line: NOTIFY sip:342@192.168.104.242:5060 SIP/2.0
  Method: NOTIFY
  [Resent Packet: False]
Message Header
```

Blue

```
v: SIP/2.0/UDP 192.168.104.204;branch=z9hG4bK0003a21f-230d-dc11-88bc-ef14648f4948
  Transport: UDP
  Sent-by Address: 192.168.104.204
  Branch: z9hG4bK0003a21f-230d-dc11-88bc-ef14648f4948
f: <sip:192.168.104.204>;tag=821a584
  SIP from address: sip:192.168.104.204
  SIP tag: 821a584
t: <sip:342@192.168.104.204>
  SIP to address: sip:342@192.168.104.204
i: 80e3cle8-750c-dc11-a771-bdlde7af321d
Cseq: 48 NOTIFY
  Sequence Number: 48
  Method: NOTIFY
Timestamp: 1180533342
Date: Wed, 30 May 2007 13:55:42 GMT
Max-Forwards: 70
m: <sip:3ComCallProcessor@192.168.104.204>
  Contact Binding: <sip:3ComCallProcessor@192.168.104.204>
  URI: <sip:3ComCallProcessor@192.168.104.204>
  SIP contact address: sip:3ComCallProcessor@192.168.104.204
Event: message-summary
User-Agent: 3Com VCX 7210 IP CallProcessor/v7.1.42
Subscription-State: active;expires=3600
c: application/simple-message-summary
Content-Length: 66
Message body
Messages-Waiting: no\r\n
Message-Account: sip:342@192.168.104.204\r\n
\r\n
```

Frame 8 (596 bytes on wire, 596 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.410458000
[Time delta from previous packet: 0.001083000 seconds]
[Time since reference or first frame: 0.054748000 seconds]
Frame Number: 8
Packet Length: 596 bytes
Capture Length: 596 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6), Dst: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  Destination: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  .... 0. .... = IG bit: Individual address (unicast)
  .... 0. .... = LG bit: Globally unique address (factory default)
  Source: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  .... 0. .... = IG bit: Individual address (unicast)
  .... 0. .... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.242 (192.168.104.242), Dst: 192.168.104.204 (192.168.104.204)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
  0000 00.. = Differentiated Services Codepoint: Default (0x00)
  .... 0. = ECN-Capable Transport (ECT): 0
  .... 0. = ECN-CE: 0
Total Length: 582
Identification: 0x0002 (2)
Flags: 0x04 (Don't Fragment)
  0... = Reserved bit: Not set
  .1.. = Don't fragment: Set
  ..0. = More fragments: Not set
Fragment offset: 0
```

Blue

```

Time to live: 255
Protocol: UDP (0x11)
Header checksum: 0x2695 [correct]
  [Good: True]
  [Bad : False]
Source: 192.168.104.242 (192.168.104.242)
Destination: 192.168.104.204 (192.168.104.204)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
Source port: 5060 (5060)
Destination port: 5060 (5060)
Length: 562
Checksum: 0x5153 [correct]
Session Initiation Protocol
Request-Line: SUBSCRIBE sip:342@192.168.104.204 SIP/2.0
Method: SUBSCRIBE
  [Resent Packet: False]
Message Header
Via: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bKcb8414148ce16a67
Transport: UDP
Sent-by Address: 192.168.104.242
Sent-by port: 5060
Branch: z9hG4bKcb8414148ce16a67
From: "342" <sip:342@192.168.104.204>;tag=4d365b2192922ba7
SIP Display info: "342"
SIP from address: sip:342@192.168.104.204
SIP tag: 4d365b2192922ba7
To: <sip:342@192.168.104.204>
SIP to address: sip:342@192.168.104.204
Contact: <sip:342@192.168.104.242:5060>
Contact Binding: <sip:342@192.168.104.242:5060>
URI: <sip:342@192.168.104.242:5060>
SIP contact address: sip:342@192.168.104.242:5060
Call-ID: 77b3d62684c102b2@192.168.104.242
CSeq: 32687 SUBSCRIBE
Sequence Number: 32687
Method: SUBSCRIBE
User-Agent: Grandstream GXV3000 1.0.1.12
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,BYE,NOTIFY,REFER,OPTIONS,INFO,SUBSCRIBE,UPDATE,PRACK
Event: message-summary
Expires: 3600
Accept: application/simple-message-summary
Content-Length: 0

Frame 9 (525 bytes on wire, 525 bytes captured)
Arrival Time: May 30, 2007 10:56:49.410890000
[Time delta from previous packet: 0.000432000 seconds]
[Time since reference or first frame: 0.055180000 seconds]
Frame Number: 9
Packet Length: 525 bytes
Capture Length: 525 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6), Dst: Ibm_22:1a:1c (00:11:25:22:1a:1c)
Destination: Ibm_22:1a:1c (00:11:25:22:1a:1c)
Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
.... 0 .... = IG bit: Individual address (unicast)
.... 0 .... = LG bit: Globally unique address (factory default)
Source: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
.... 0 .... = IG bit: Individual address (unicast)
.... 0 .... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)

```

Blue

```
Internet Protocol, Src: 192.168.104.242 (192.168.104.242), Dst: 192.168.104.204 (192.168.104.204)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
    0000 00.. = Differentiated Services Codepoint: Default (0x00)
    .... ..0. = ECN-Capable Transport (ECT): 0
    .... ...0 = ECN-CE: 0
Total Length: 511
Identification: 0x0003 (3)
Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (0x11)
Header checksum: 0x26db [correct]
    [Good: True]
    [Bad : False]
Source: 192.168.104.242 (192.168.104.242)
Destination: 192.168.104.204 (192.168.104.204)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
Source port: 5060 (5060)
Destination port: 5060 (5060)
Length: 491
Checksum: 0x42b8 [correct]
Session Initiation Protocol
Status-Line: SIP/2.0 200 OK
Status-Code: 200
[Resent Packet: False]
Message Header
Via: SIP/2.0/UDP 192.168.104.204;branch=z9hG4bK0003a21f-230d-dc11-88bc-ef14648f4948
Transport: UDP
Sent-by Address: 192.168.104.204
Branch: z9hG4bK0003a21f-230d-dc11-88bc-ef14648f4948
From: <sip:192.168.104.204>;tag=821a584
SIP from address: sip:192.168.104.204
SIP tag: 821a584
To: <sip:342@192.168.104.204>;tag=71b08c219e638d32
SIP to address: sip:342@192.168.104.204
SIP tag: 71b08c219e638d32
Call-ID: 80e3cle8-750c-dc11-a771-bd1de7af321d
CSeq: 48 NOTIFY
Sequence Number: 48
Method: NOTIFY
User-Agent: Grandstream GXV3000 1.0.1.12
Contact: <sip:342@192.168.104.242:5060>
Contact Binding: <sip:342@192.168.104.242:5060>
URI: <sip:342@192.168.104.242:5060>
SIP contact address: sip:342@192.168.104.242:5060
Allow: INVITE,ACK,CANCEL,BYE,NOTIFY,REFER,OPTIONS,INFO,SUBSCRIBE,UPDATE,PRACK
Supported: replaces, timer, 100rel, path
Content-Length: 0
```

Frame 10 (321 bytes on wire, 321 bytes captured)

```
Arrival Time: May 30, 2007 10:56:49.411210000
[Time delta from previous packet: 0.000320000 seconds]
[Time since reference or first frame: 0.055500000 seconds]
Frame Number: 10
Packet Length: 321 bytes
Capture Length: 321 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
```

Blue

```

Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  ....0000000000000000 = IG bit: Individual address (unicast)
  ....00. .... = LG bit: Globally unique address (factory default)
  Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
  ....0000000000000000 = IG bit: Individual address (unicast)
  ....00. .... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
    1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
    ....00. = ECN-Capable Transport (ECT): 0
    ....000 = ECN-CE: 0
  Total Length: 307
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
  Fragment offset: 0
  Time to live: 64
  Protocol: UDP (0x11)
  Header checksum: 0xe5f2 [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.204 (192.168.104.204)
  Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
  Length: 287
  Checksum: 0xabf5 [correct]
Session Initiation Protocol
  Status-Line: SIP/2.0 100 Trying
  Status-Code: 100
  [Resent Packet: False]
  Message Header
    v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bKcb8414148ce16a67
      Transport: UDP
      Sent-by Address: 192.168.104.242
      Sent-by port: 5060
      Branch: z9hG4bKcb8414148ce16a67
    f: "342"<sip:342@192.168.104.204>;tag=4d365b2192922ba7
      SIP Display info: "342"
      SIP from address: sip:342@192.168.104.204
      SIP tag: 4d365b2192922ba7
    t: <sip:342@192.168.104.204>
      SIP to address: sip:342@192.168.104.204
    i: 77b3d62684c102b2@192.168.104.242
    Cseq: 32687 SUBSCRIBE
      Sequence Number: 32687
      Method: SUBSCRIBE
    Date: Wed, 30 May 2007 13:55:42 GMT
    Content-Length: 0
Frame 11 (548 bytes on wire, 548 bytes captured)
  Arrival Time: May 30, 2007 10:56:49.412446000
  [Time delta from previous packet: 0.001236000 seconds]
  [Time since reference or first frame: 0.056736000 seconds]
  Frame Number: 11
  Packet Length: 548 bytes

```

Blue

```
Capture Length: 548 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:sip]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: Ibm_22:1a:1c (00:11:25:22:1a:1c), Dst: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
  Destination: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
    Address: Grandstr_0c:dc:d6 (00:0b:82:0c:dc:d6)
      .... 0... = IG bit: Individual address (unicast)
      .... 0... = LG bit: Globally unique address (factory default)
  Source: Ibm_22:1a:1c (00:11:25:22:1a:1c)
    Address: Ibm_22:1a:1c (00:11:25:22:1a:1c)
      .... 0... = IG bit: Individual address (unicast)
      .... 0... = LG bit: Globally unique address (factory default)
  Type: IP (0x0800)
Internet Protocol, Src: 192.168.104.204 (192.168.104.204), Dst: 192.168.104.242 (192.168.104.242)
  Version: 4
  Header length: 20 bytes
  Differentiated Services Field: 0xb8 (DSCP 0x2e: Expedited Forwarding; ECN: 0x00)
    1011 10.. = Differentiated Services Codepoint: Expedited Forwarding (0x2e)
    .... 0.. = ECN-Capable Transport (ECT): 0
    .... 0.. = ECN-CE: 0
  Total Length: 534
  Identification: 0x0000 (0)
  Flags: 0x04 (Don't Fragment)
    0... = Reserved bit: Not set
    .1.. = Don't fragment: Set
    ..0. = More fragments: Not set
  Fragment offset: 0
  Time to live: 64
  Protocol: UDP (0x11)
  Header checksum: 0xe50f [correct]
    [Good: True]
    [Bad : False]
  Source: 192.168.104.204 (192.168.104.204)
  Destination: 192.168.104.242 (192.168.104.242)
User Datagram Protocol, Src Port: 5060 (5060), Dst Port: 5060 (5060)
  Source port: 5060 (5060)
  Destination port: 5060 (5060)
  Length: 514
  Checksum: 0x7ad1 [correct]
Session Initiation Protocol
  Status-Line: SIP/2.0 200 OK
  Status-Code: 200
  [Resent Packet: False]
Message Header
  v: SIP/2.0/UDP 192.168.104.242:5060;branch=z9hG4bKcb8414148ce16a67
    Transport: UDP
    Sent-by Address: 192.168.104.242
    Sent-by port: 5060
    Branch: z9hG4bKcb8414148ce16a67
  f: "342"<sip:342@192.168.104.204>;tag=4d365b2192922ba7
    SIP Display info: "342"
    SIP from address: sip:342@192.168.104.204
    SIP tag: 4d365b2192922ba7
  t: <sip:342@192.168.104.204>;tag=821c704
    SIP to address: sip:342@192.168.104.204
    SIP tag: 821c704
  i: 77b3d62684c102b2@192.168.104.242
  Cseq: 32687 SUBSCRIBE
    Sequence Number: 32687
    Method: SUBSCRIBE
  Date: Wed, 30 May 2007 13:55:42 GMT
  m: <sip:3ComCallProcessor@192.168.104.204>
    Contact Binding: <sip:3ComCallProcessor@192.168.104.204>
    URI: <sip:3ComCallProcessor@192.168.104.204>
```

Blue

```
SIP contact address: sip:3ComCallProcessor@192.168.104.204
Allow: INVITE,ACK,BYE,CANCEL,REFER,SUBSCRIBE,NOTIFY,UPDATE,OPTIONS,MESSAGE,FEATURE
Expires: 3600
Event: message-summary
User-Agent: 3Com VCX 7210 IP CallProcessor/v7.1.42
Content-Length: 0
```