VoIP Gateway/IP-PBX Interworking with Skype

IPNext320
Hybrid IP-PBX

IPNext50
IP-PBX

IPNext20
IP-PBX

AP100B
VoIP Gateway

AddPac

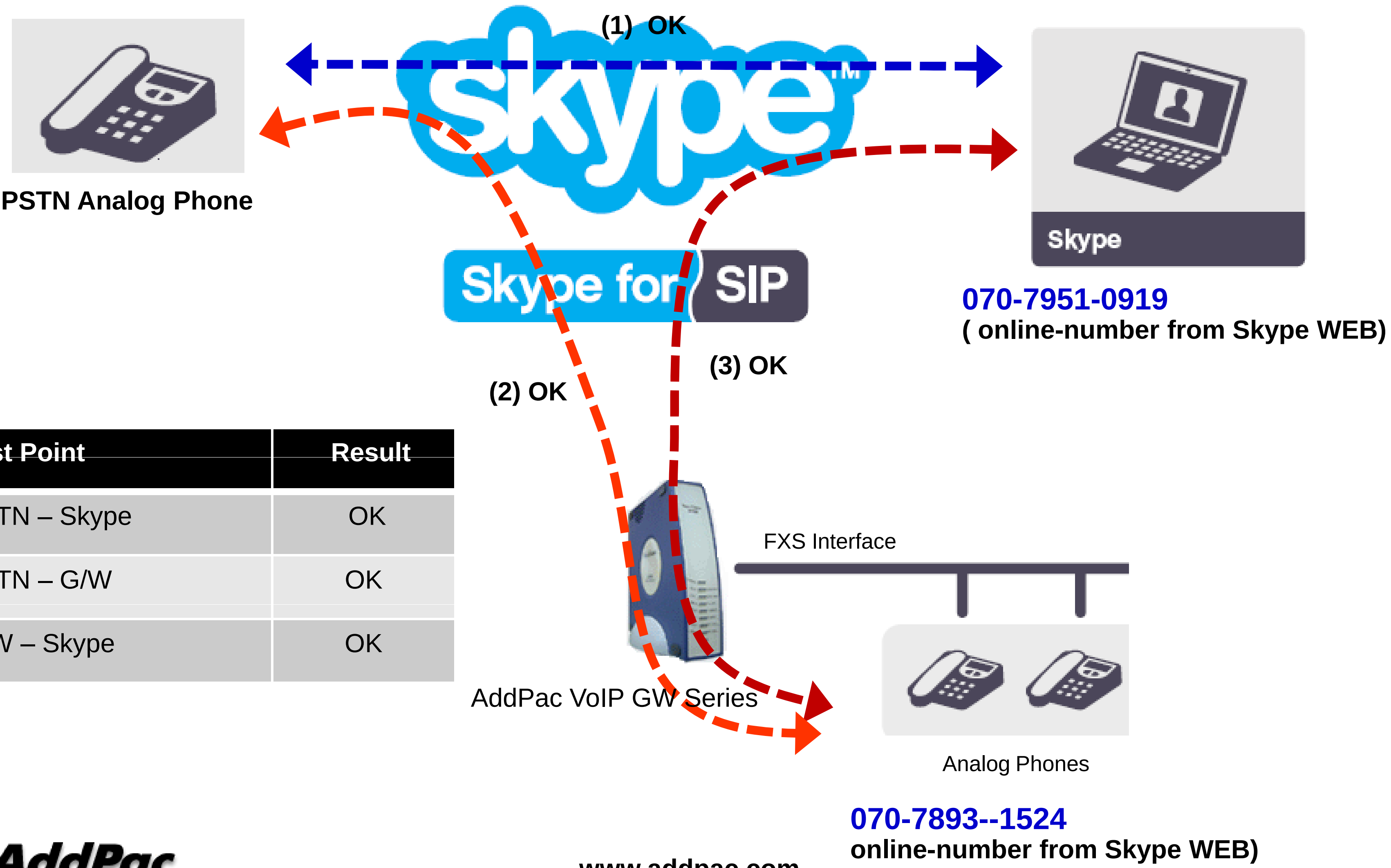
AddPac Technology

2012, Sales and Marketing

Contents

Skype Interworking Test
(GW – Skype :using online-number)

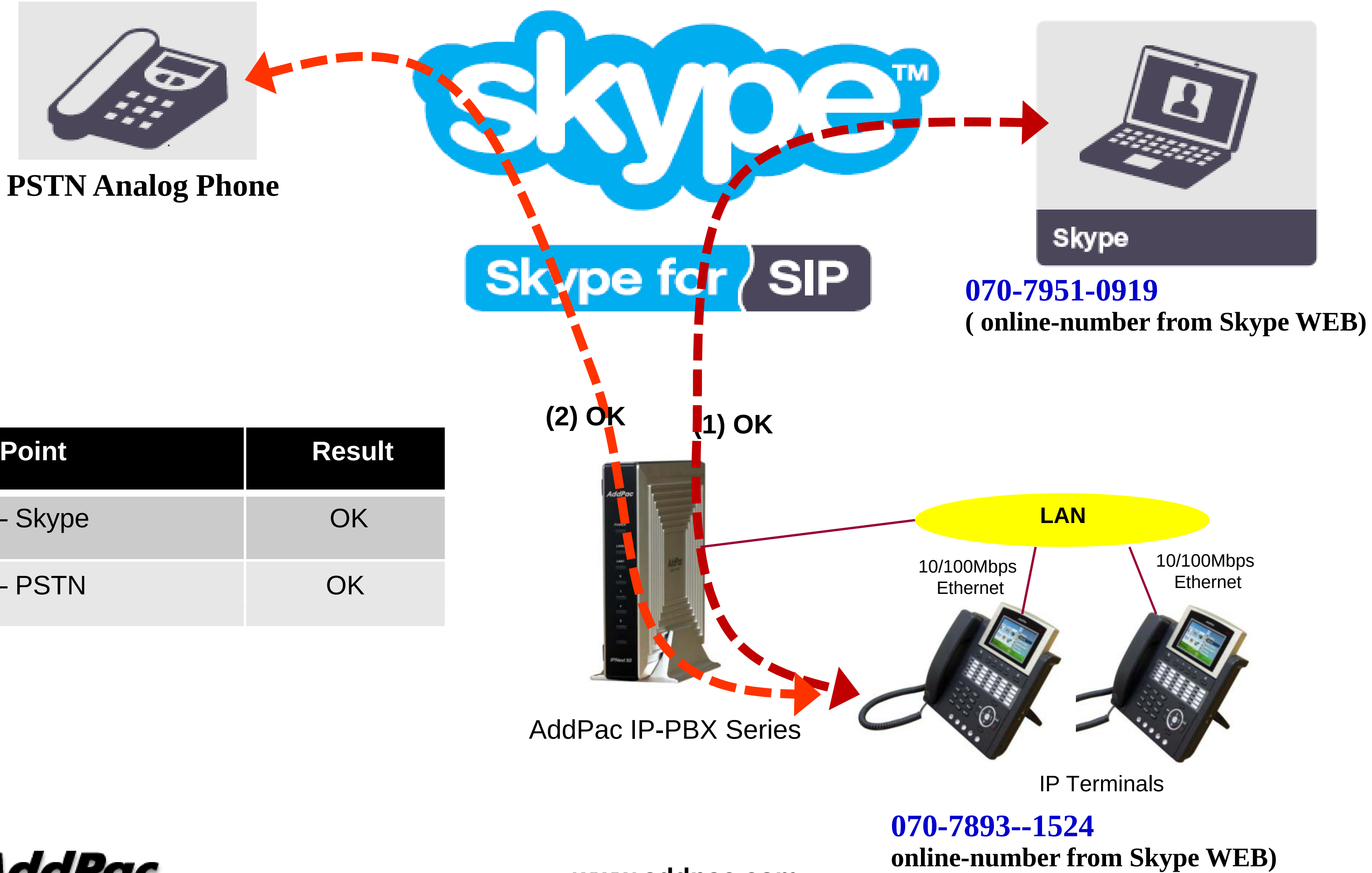
Test System Diagram (GW – Skype)



Test Point	Result
PSTN – Skype	OK
PSTN – G/W	OK
G/W – Skype	OK

Skype Interworking Test
(IP-PBX– Skype :using online-number)

Test System Diagram (IP-PBX – Skype)



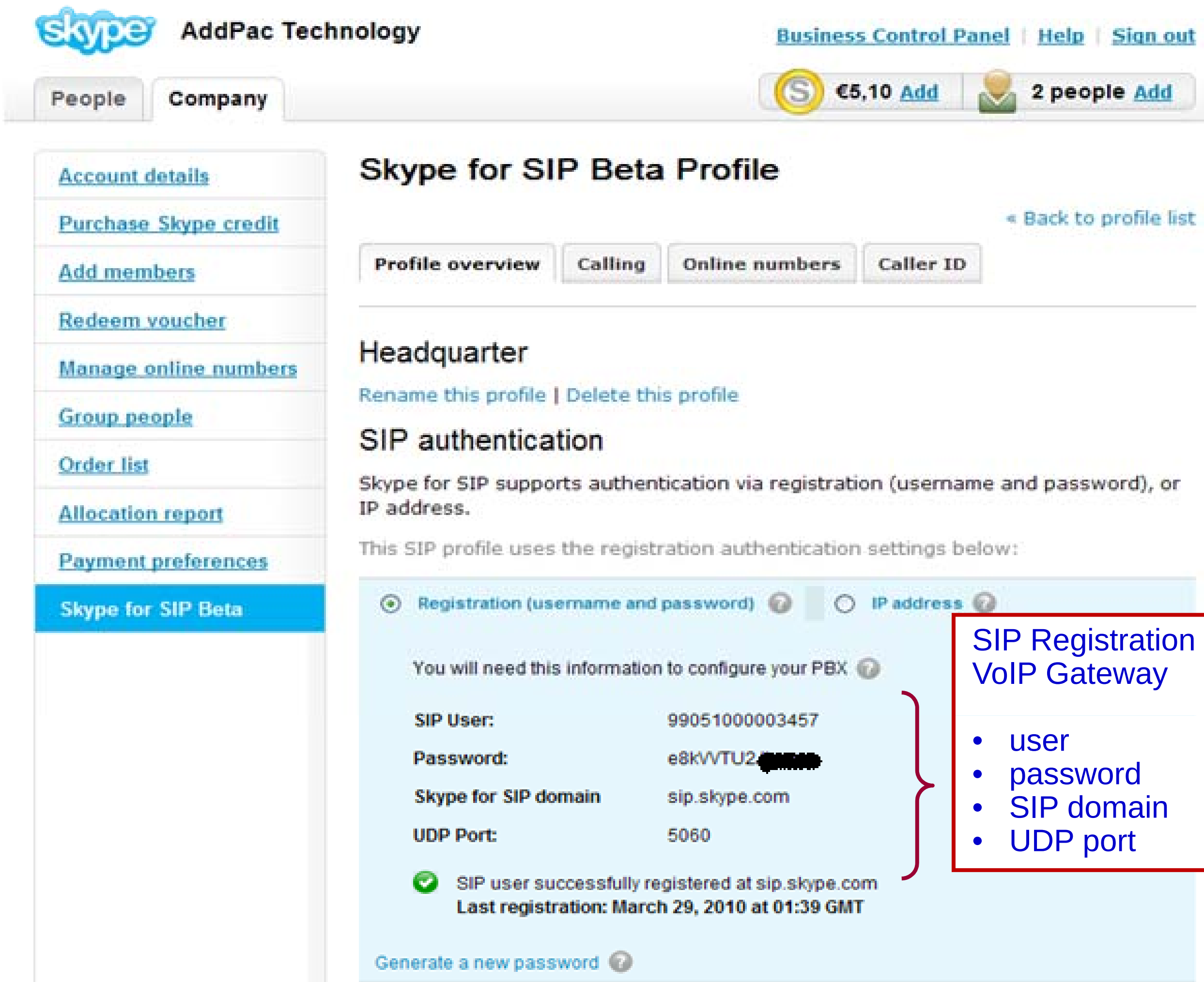
Test Point	Result
PBX– Skype	OK
PBX– PSTN	OK

Skype Interworking Test
(IP-PBX– Skype :using Skype-name)

Test System Diagram (IP-PBX – Skype)

Skype Configuration for IP-PBX or G/W (1/3)

Skype for SIP Beta

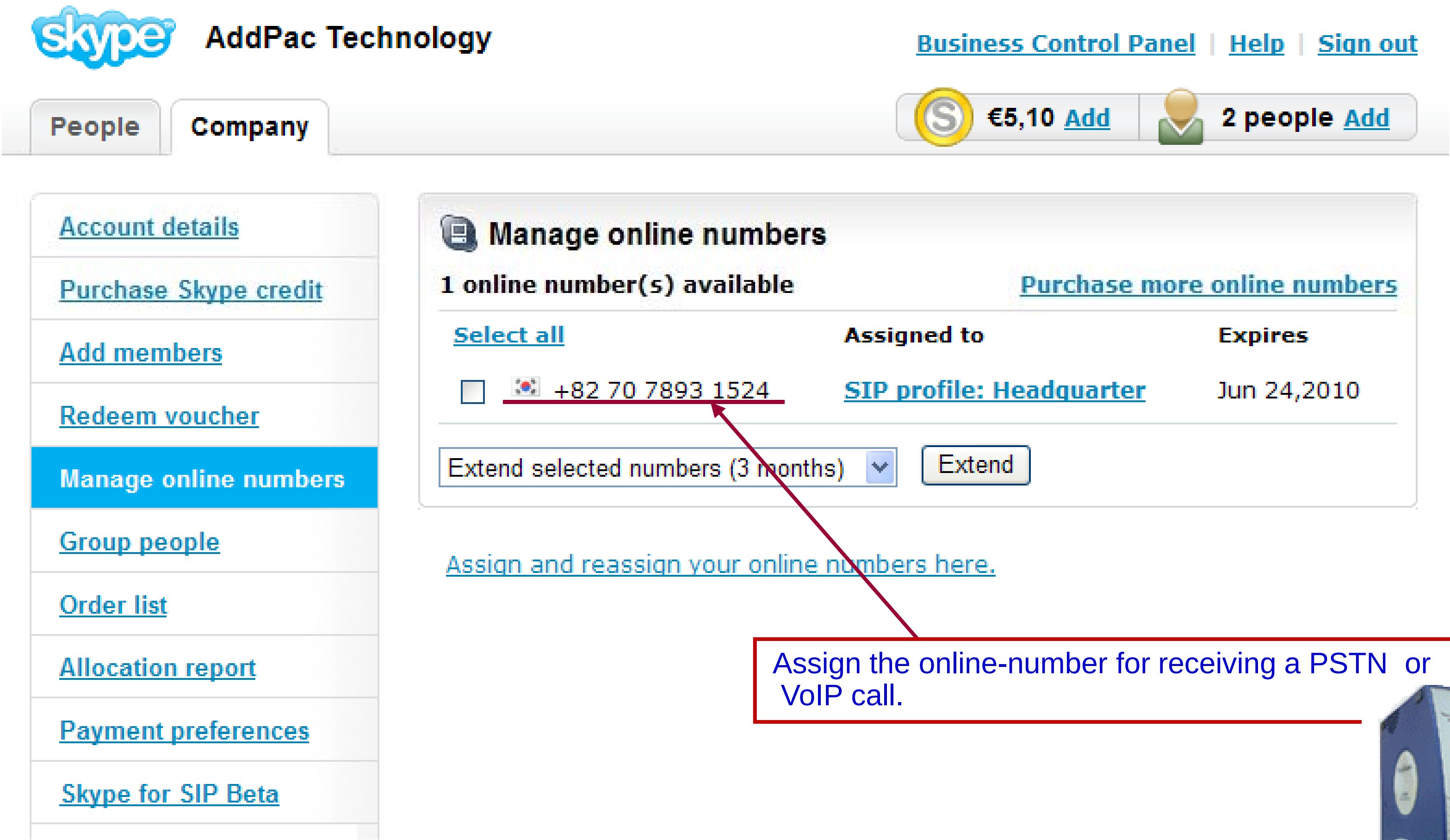


SIP Registration Information for IP-PBX or VoIP Gateway

- user
- password
- SIP domain
- UDP port

Skype Configuration for IP-PBX or G/W (2/3)

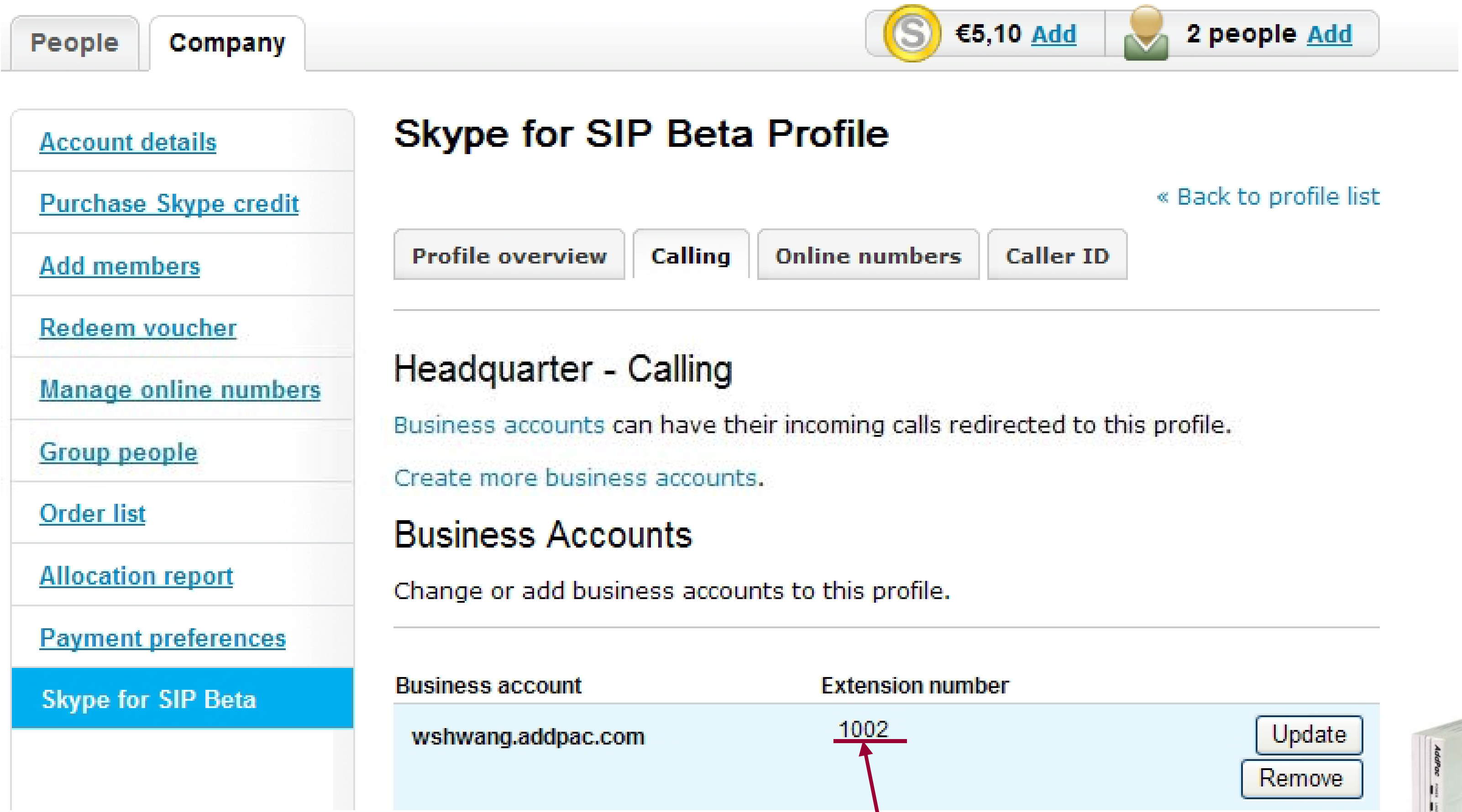
Manage online numbers



Assign the online-number for receiving a PSTN or VoIP call.

Skype Configuration for IP-PBX or G/W (3/3)

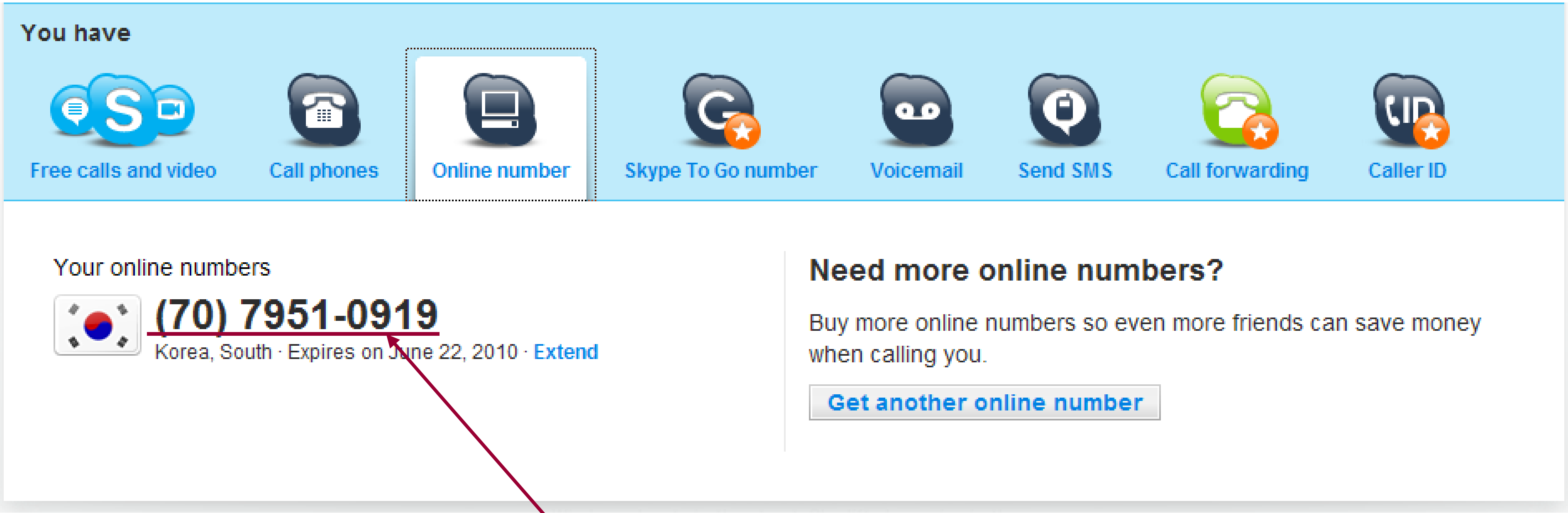
Configure Extension Line



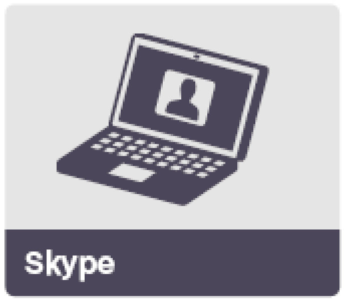
Assign the extension line number for receiving a PSTN or VoIP call.

Configuration for Skype Application

Online number for Skype Application



Assign the online-number for receiving a PSTN or VoIP call.



AddPac VoIP Gateway Configuration

AddPac G/W configuration

```
dial-peer voice 0 pots
 destination-pattern 827078931524
 port 0/0
 no register e164
 user-name 99051000003457
 user-password e8kVVTU2Jxxxxx
!
dial-peer voice 1 pots
 destination-pattern 99051000003457
 port 0/0
 user-password e8kVVTU2Jxxxxx

sip-ua
 sip-server sip.skype.com
 called-party-number to-field
```

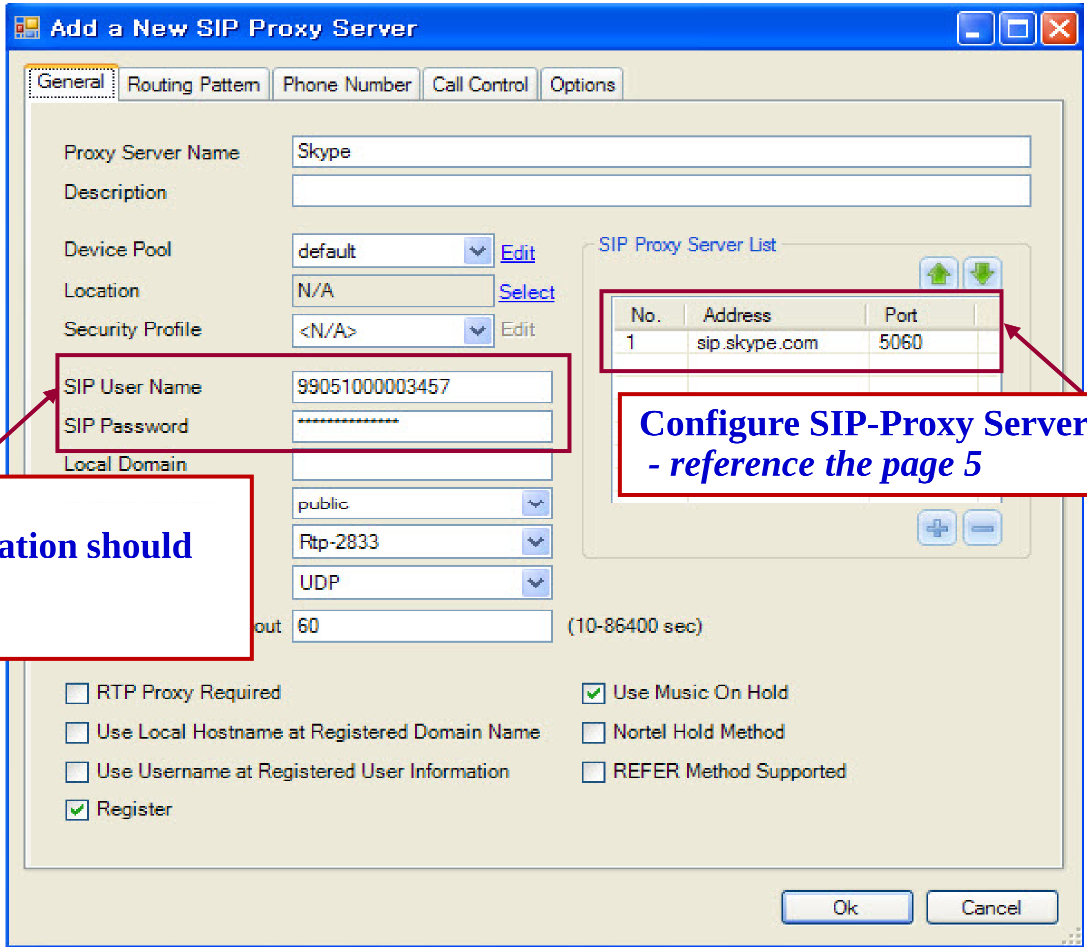
Configure online-number for receiving a call. Also, The authentication information should be configured.
- reference page 4-5

The authentication information should be configured for REGISTRATION.
- reference page 5

Configure SIP-Proxy Server information. The option(called-party-number) should be configured for extracting called-number from 'To filed'.
- reference page 5

AddPac IP-PBX Configuration(1/4)

Skype Proxy Server Configuration



Configure SIP-Proxy Server information.
- reference the page 5

The authentication information should be configured.
- reference the page 4

AddPac IP-PBX Configuration(2/4)

Translation Rule Configuration

Number Translation Rule

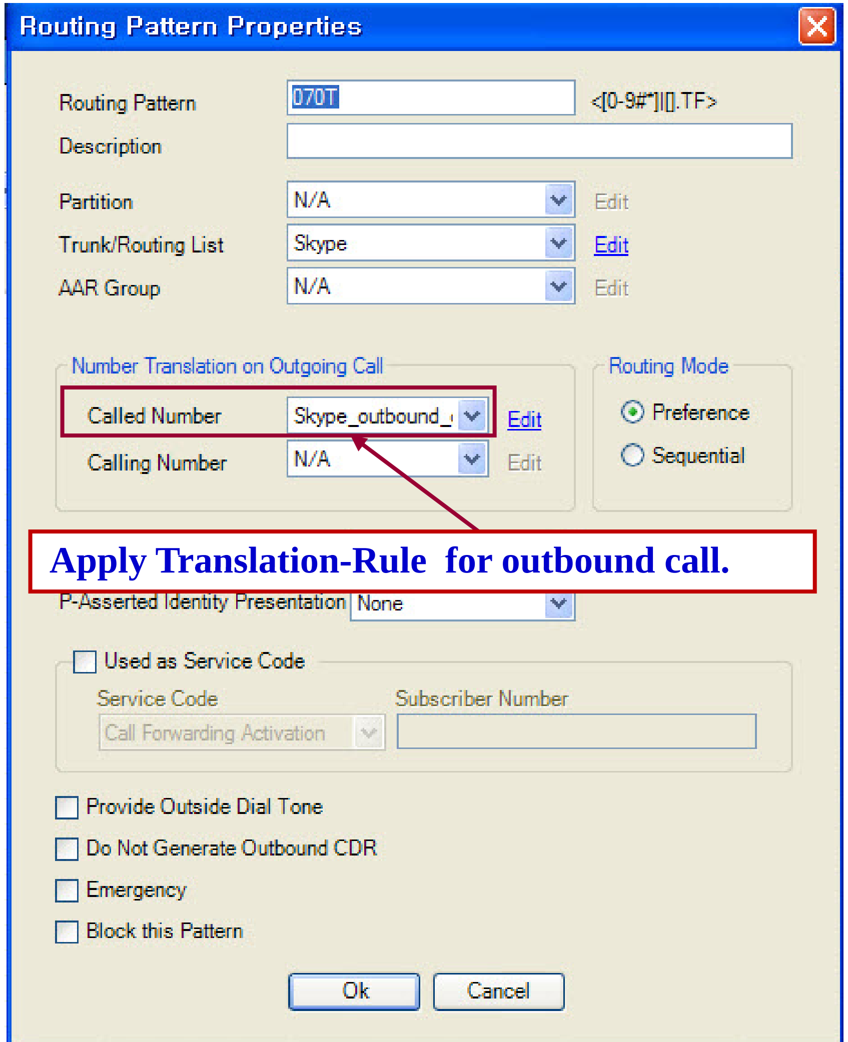
No	Number Translation Rul	Input Matched Pattern	Substituted Pattern	Description
1	외부발신_called	9T 8T 53T 54T 55T 56T 57T	%02%99 %02%99 %03%99 %03%99 %03%99 %03%99 %03%99	
2	Skype_outbound_called	070T	82%02%99	
3	Skype_inbound_called	8270T	0%03%99	

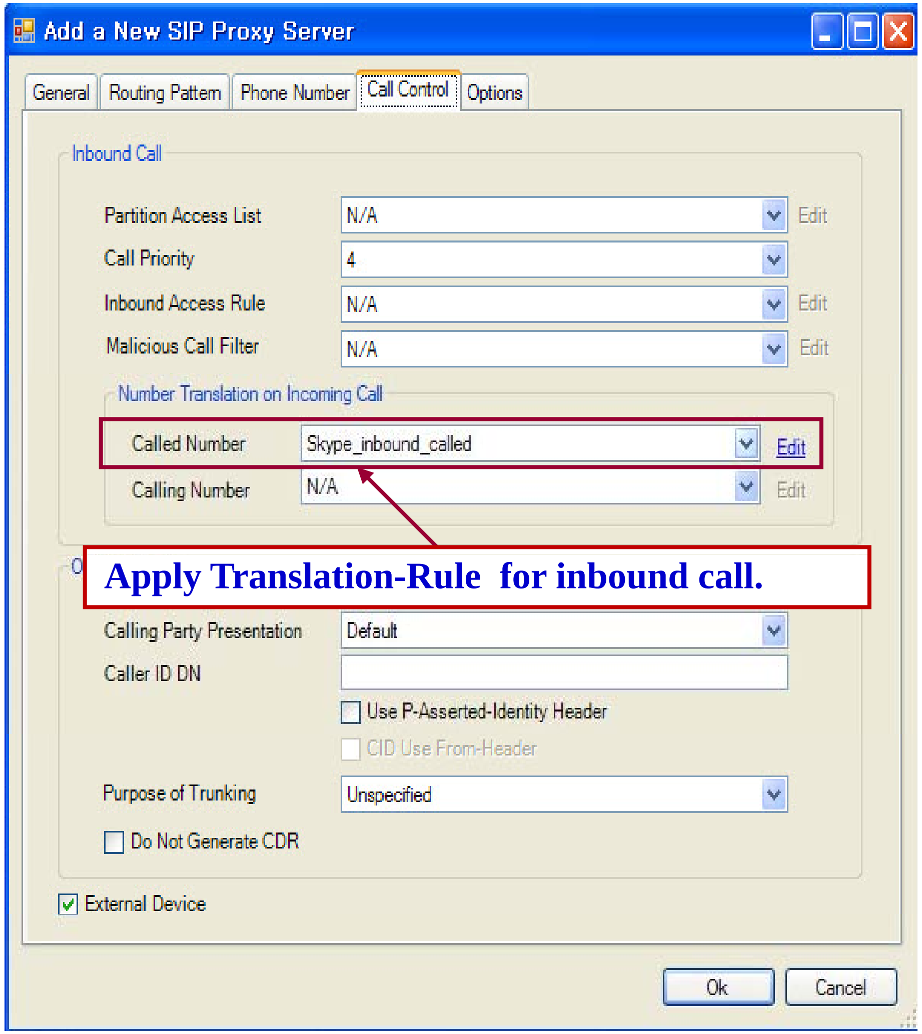
Configure Translation-Rules for inbound and outbound call.

For the outbound call starting with '070', Eliminate one digit, and then insert '82' digits.
(ex: called-number 070-8888-9999 → 8270-8888-9999)
For the inbound call starting with '8270', Eliminate two digits, and then insert '0' digit.
(ex: called-number 8270-8888-9999 →070-8888-9999)

AddPac IP-PBX Configuration(3/4)

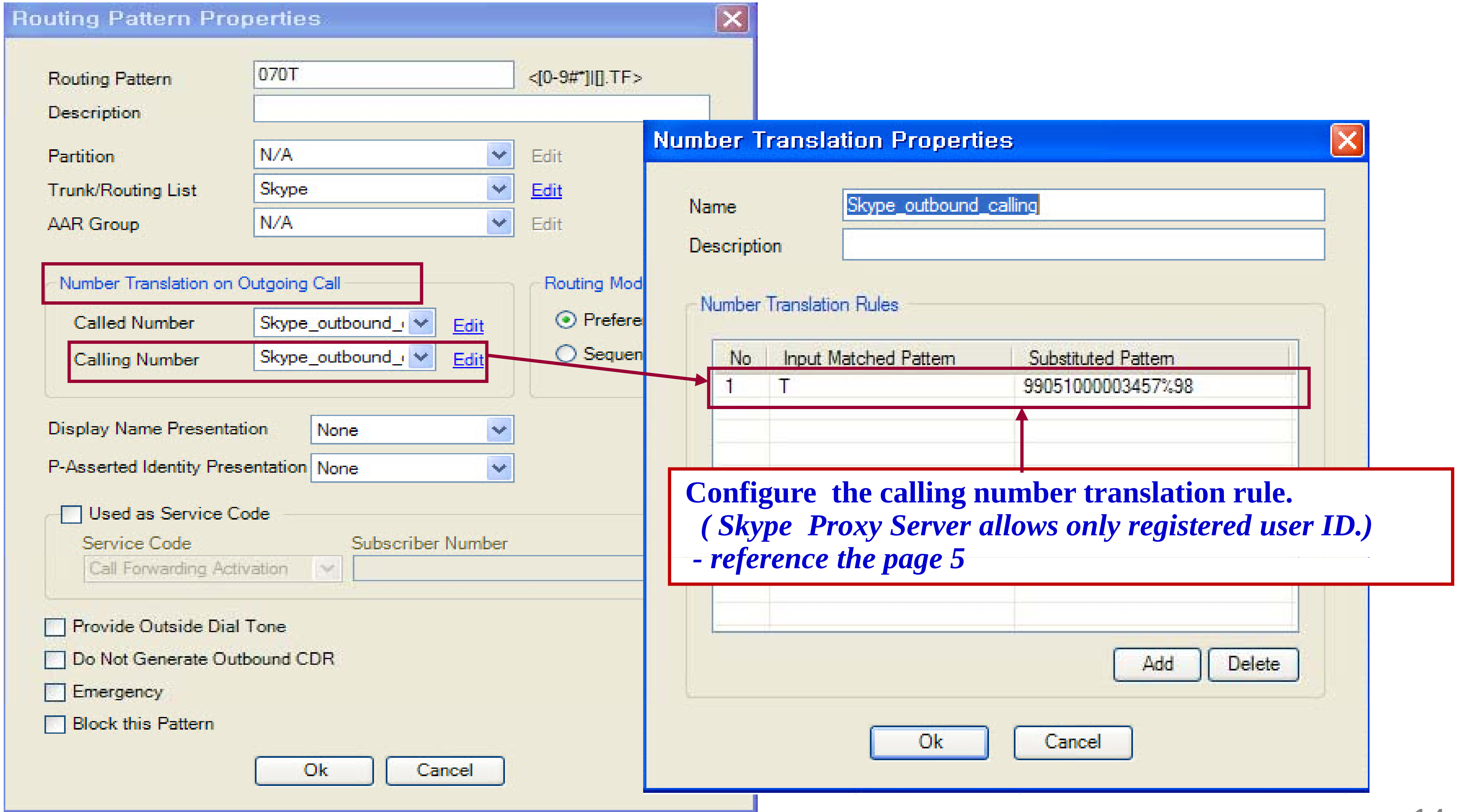
Apply Translation Rule



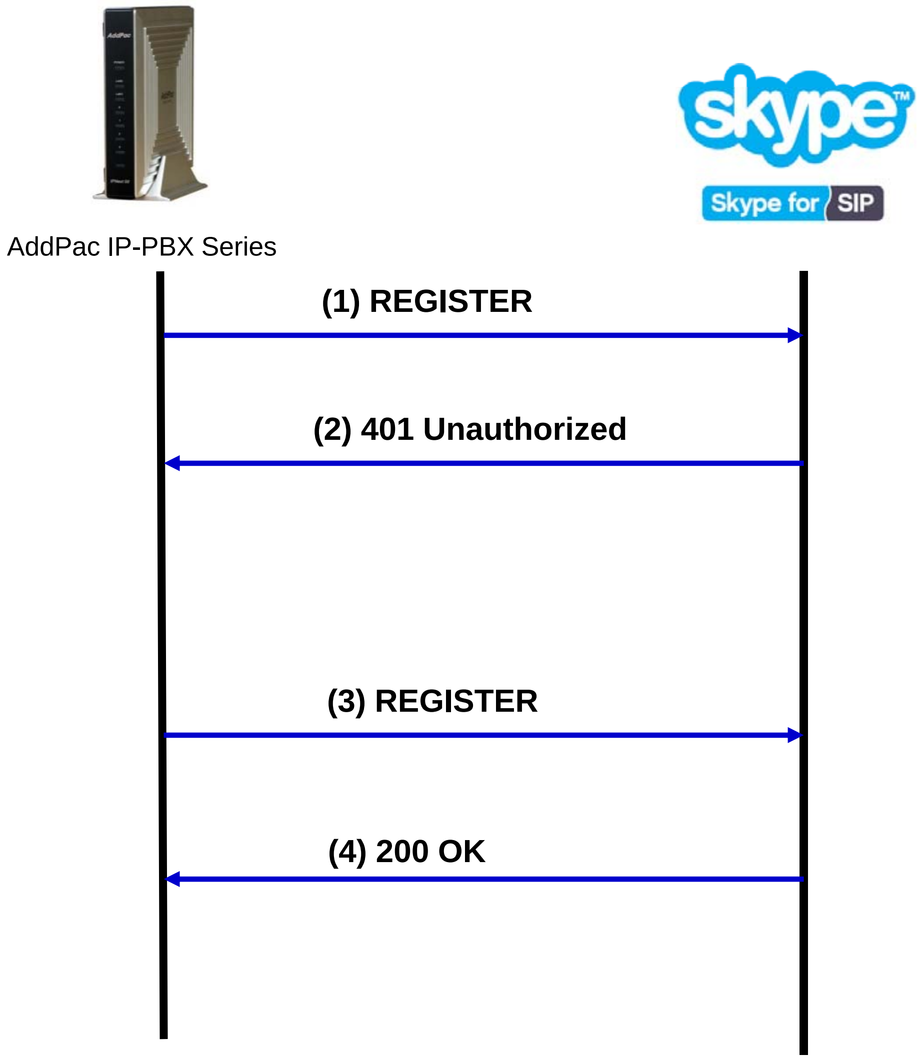


AddPac IP-PBX Configuration(4/4)

Configure Routing Pattern



SIP REGISTER (1/3)



SIP REGISTER (2/3)

(1) REGISTER

```
⊟ Request-Line: REGISTER sip:sip.skype.com SIP/2.0
    Method: REGISTER
    [Resent Packet: False]
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK494b7346a41
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=494b7346a4
  ⊞ To: sip:99051000003457@sip.skype.com
    Call-ID: 495fb04b-9947-7314-8046-0002a4ff4869@60.196.6.77
    CSeq: 1 REGISTER
    Date: Mon, 29 Mar 2010 17:05:29 GMT
    User-Agent: AddPac SIP Gateway
  ⊞ Contact: <sip:99051000003457@60.196.6.77>;expires=60
    Expires: 60
    Content-Length: 0
    Max-Forwards: 70
```

SIP user is inserted to From-Field.
- reference the page 5

(2) 401 Unauthorized

```
⊟ Status-Line: SIP/2.0 401 Unauthorized
    Status-Code: 401
    [Resent Packet: False]
⊟ Message Header
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=494b7346a4
  ⊞ To: <sip:99051000003457@sip.skype.com>;tag=05aed4eb43523e287156e2da6464d890.fe30
    Call-ID: 495fb04b-9947-7314-8046-0002a4ff4869@60.196.6.77
    CSeq: 1 REGISTER
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK494b7346a41
    WWW-Authenticate: Digest realm="sip.skype.com", nonce="4bb05f6b000128eb7223ee8f101719a27202e08df27d98d7", algorithm=MD5
    Server: OpenSIPS
    Content-Length: 0
```

SIP REGISTER (3/3)

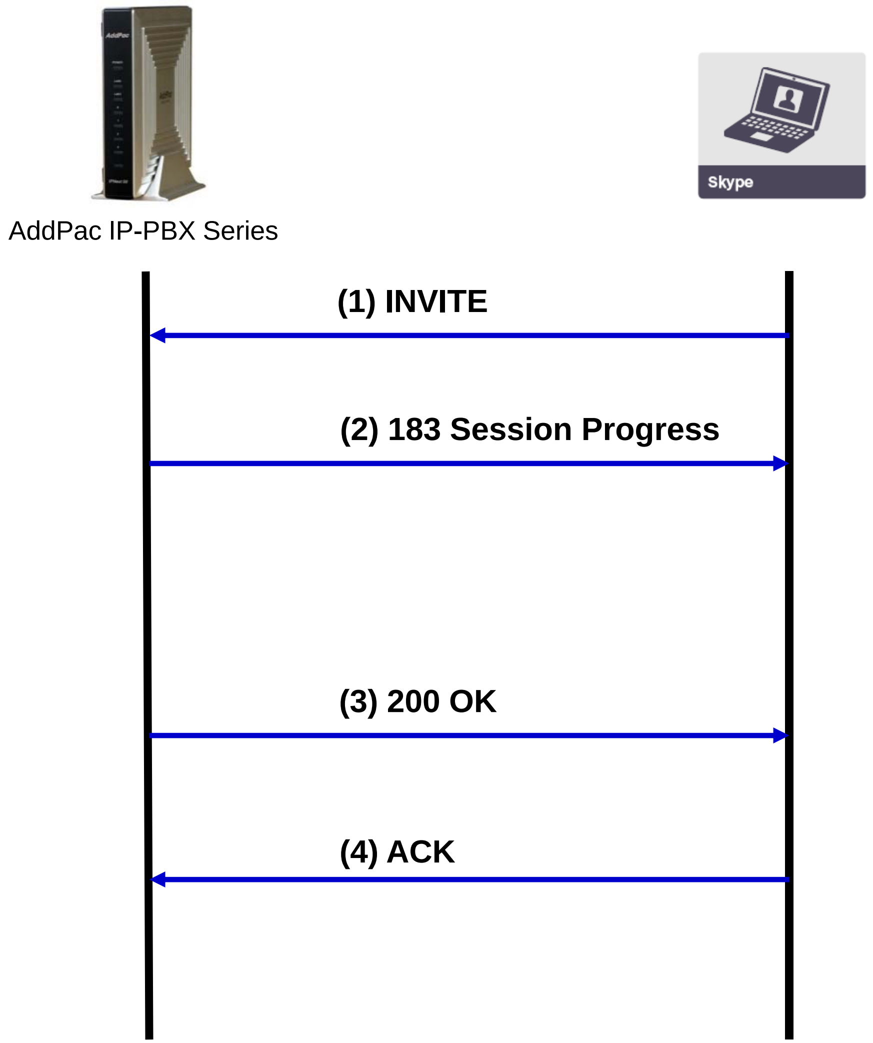
(3) REGISTER

```
⊟ Request-Line: REGISTER sip:sip.skype.com SIP/2.0
    Method: REGISTER
    [Resent Packet: False]
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK494b7346a42
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=494b7346a4
  ⊞ To: sip:99051000003457@sip.skype.com
    Call-ID: 495fb04b-9947-7314-8046-0002a4ff4869@60.196.6.77
    CSeq: 2 REGISTER
    Date: Mon, 29 Mar 2010 17:05:29 GMT
    User-Agent: AddPac SIP Gateway
    Authorization: Digest username="99051000003457", realm="sip.skype.com", nonce="4bb05f6b000128eb7223ee8f101719a27202e08df27d98d7", uri="sip:sip.skype.com", response="9e7434a787cdef395518b
  ⊞ Contact: <sip:99051000003457@60.196.6.77>;expires=60
    Expires: 60
    Content-Length: 0
    Max-Forwards: 70
```

(4) 200 OK

```
⊟ Status-Line: SIP/2.0 200 OK
    Status-Code: 200
    [Resent Packet: False]
⊟ Message Header
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=494b7346a4
  ⊞ To: <sip:99051000003457@sip.skype.com>;tag=05aed4eb43523e287156e2da6464d890.d621
    Call-ID: 495fb04b-9947-7314-8046-0002a4ff4869@60.196.6.77
    CSeq: 2 REGISTER
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK494b7346a42
  ⊞ Contact: <sip:99051000003457@60.196.6.77>;expires=60
    Server: OpenSIPS
    Expires: 60
    Content-Length: 0
```

Inbound Call from Skype (1/5)



Inbound Call from Skype (2/5)

(1) INVITE

```
⊞ Request-Line: INVITE sip:99051000003457@60.196.6.77 SIP/2.0
⊟ Message Header
  ⊞ From: <sip:Anonymous@sip.skype.com>;tag=a4a109cc-13c4-4bb0601c-2729e3f7-36880b6f
  ⊞ To: <sip:827078931524@sip.skype.com>
    Call-ID: CXC-59-6942a370-a4a109cc-13c4-4bb0601c-2729e3f7-2afee549
    CSeq: 1 INVITE
    Via: SIP/2.0/UDP 204.9.161.164:5060;branch=z9hG4bK-287ea-4bb0601c-2729e3f7-3242e07c
    Max-Forwards: 12
    User-Agent: sipgw-1.0
    Privacy: id
    P-Asserted-Identity: <sip:Anonymous@sip.skype.com>
    Remote-Party-ID: <sip:Anonymous@sip.skype.com>;party=calling;screen=yes;privacy=full
    Allow: INVITE,ACK,CANCEL,OPTIONS,BYE
  ⊞ Contact: <sip:Anonymous@204.9.161.164:5060;transport=udp>
    Content-Type: application/sdp
    Content-Length: 263
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): Anonymous 1269850140 1269850140 IN IP4 204.9.161.164
      Session Name (s): Skype call
    ⊞ Connection Information (c): IN IP4 204.9.161.164
    ⊞ Time Description, active time (t): 0 0
    ⊞ Media Description, name and address (m): audio 28924 RTP/AVP 18 0 8 101
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:0 PCMU/8000
    ⊞ Media Attribute (a): rtpmap:8 PCMA/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:18 annexb=no
```

Inbound Call from Skype (3/5)

(2) 183 Session Progress

```
⊞ Status-Line: SIP/2.0 183 Session Progress
⊟ Message Header
    Via: SIP/2.0/UDP 204.9.161.164:5060;branch=z9hG4bK-287ea-4bb0601c-2729e3f7-3242e07c
  ⊞ From: <sip:Anonymous@sip.skype.com>;tag=a4a109cc-13c4-4bb0601c-2729e3f7-36880b6f
  ⊞ To: <sip:827078931524@sip.skype.com>;tag=194b5b49a4
    Call-ID: CXC-59-6942a370-a4a109cc-13c4-4bb0601c-2729e3f7-2afee549
    CSeq: 1 INVITE
    User-Agent: AddPac SIP Gateway
  ⊞ Contact: <sip:99051000003457@60.196.6.77>
    Content-Type: application/sdp
    Content-Length: 177
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): addpac 1269850137 1269850137 IN IP4 60.196.6.77
      Session Name (s): AddPac Gateway SDP
    ⊞ Connection Information (c): IN IP4 60.196.6.77
    ⊞ Time Description, active time (t): 1269850137 0
      Session Attribute (a): sendonly
    ⊞ Media Description, name and address (m): audio 26128 RTP/AVP 18
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
```

Inbound Call from Skype (4/5)

(3) 200 OK

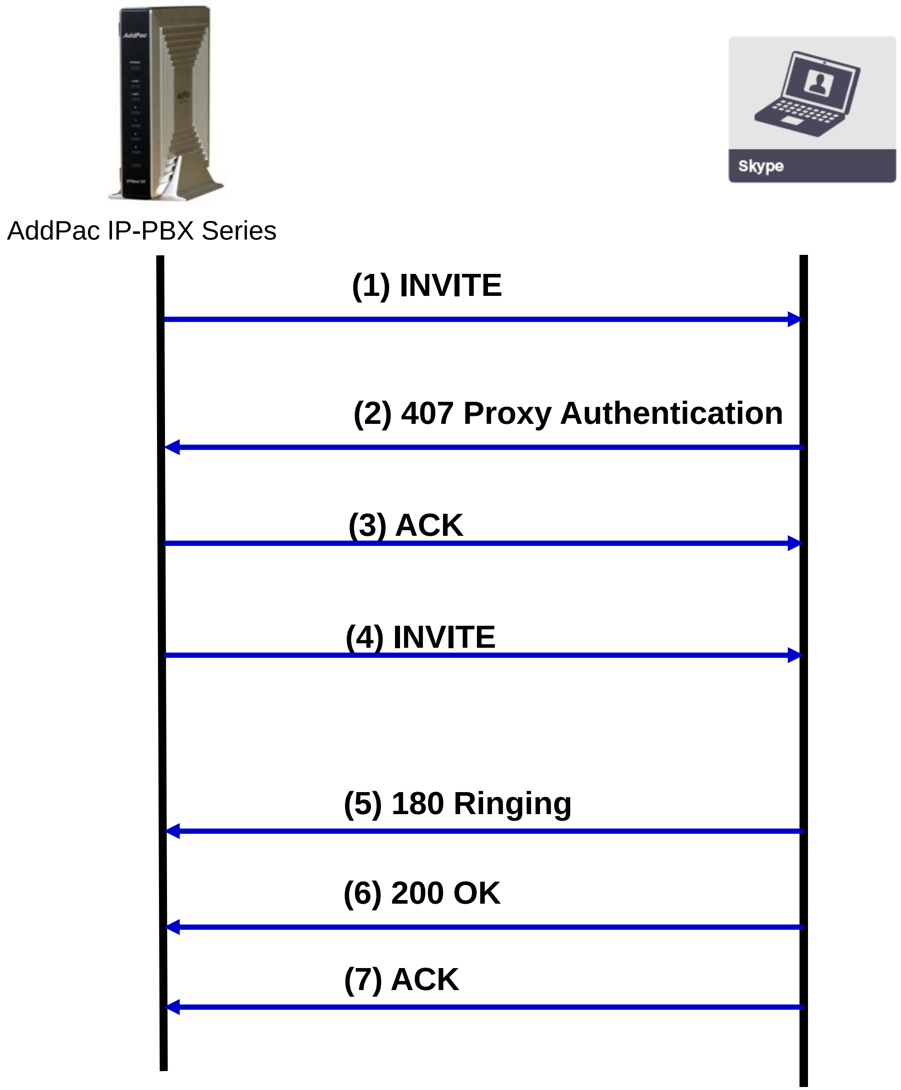
```
⊞ Status-Line: SIP/2.0 200 OK
⊟ Message Header
    Via: SIP/2.0/UDP 204.9.161.164:5060;branch=z9hG4bK-287ea-4bb0601c-2729e3f7-3242e07c
  ⊞ From: <sip:Anonymous@sip.skype.com>;tag=a4a109cc-13c4-4bb0601c-2729e3f7-36880b6f
  ⊞ To: <sip:827078931524@sip.skype.com>;tag=194b5b49a4
    Call-ID: CXC-59-6942a370-a4a109cc-13c4-4bb0601c-2729e3f7-2afee549
    CSeq: 1 INVITE
    User-Agent: AddPac SIP Gateway
  ⊞ Contact: <sip:99051000003457@60.196.6.77>
    Content-Type: application/sdp
    Content-Length: 248
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): 07078931524 1269882543 1269882543 IN IP4 172.17.111.211
      Session Name (s): AddPac Gateway SDP
    ⊞ Connection Information (c): IN IP4 172.17.111.211
    ⊞ Time Description, active time (t): 1269882543 0
    ⊞ Media Description, name and address (m): audio 23106 RTP/AVP 18 101
    ⊞ Media Attribute (a): ptime:20
    ⊞ Media Attribute (a): rtpmap:18 G729/8000/1
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000/1
    ⊞ Media Attribute (a): fmtp:101 0-15
```

Inbound Call from Skype (5/5)

(4) ACK

```
⊞ Request-Line: ACK sip:99051000003457@60.196.6.77 SIP/2.0
⊟ Message Header
  ⊞ From: <sip:Anonymous@sip.skype.com>;tag=a4a109cc-13c4-4bb0601c-2729e3f7-36880b6f
  ⊞ To: <sip:827078931524@sip.skype.com>;tag=194b5b49a4
    Call-ID: CXC-59-6942a370-a4a109cc-13c4-4bb0601c-2729e3f7-2afee549
    CSeq: 1 ACK
    Via: SIP/2.0/UDP 204.9.161.164:5060;branch=z9hG4bK-287eb-4bb0601f-2729ee10-66a221b2
    Max-Forwards: 70
    P-Asserted-Identity: <sip:Anonymous@sip.skype.com>
  ⊞ Contact: <sip:Anonymous@204.9.161.164:5060;transport=udp>
    Content-Length: 0
```

Outbound Call from IP-PBX (1/7)



Outbound Call from IP-PBX (2/7)

(1) INVITE

```
⊞ Request-Line: INVITE sip:827079510919@sip.skype.com SIP/2.0
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca484
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 84 INVITE
    Supported: timer, 100rel
    Min-SE: 1800
    Date: Mon, 29 Mar 2010 17:36:38 GMT
    Session-Expires: 1800
    User-Agent: AddPac IP-PBX
  ⊞ Contact: <sip:99051000003457@60.196.6.77>
    Accept: application/sdp
    Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, UPDATE, PRACK, REFER, NOTIFY, INFO
    Content-Type: application/sdp
    Content-Length: 449
    Max-Forwards: 69
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): 99051000003457 1269884196 1269884196 IN IP4 172.17.101.240
      Session Name (s): AddPac Gateway SDP
    ⊞ Connection Information (c): IN IP4 172.17.101.240
    ⊞ Time Description, active time (t): 1269884196 0
    ⊞ Media Description, name and address (m): audio 23394 RTP/SAVP 18 101
    ⊞ Media Attribute (a): ptime:20
    ⊞ Media Attribute (a): crypto:1 AES_CM_128_HMAC_SHA1_80 inline:WzF4/tpRiWLdXEzcioXzodD0OffSwJXMzmE7wrAX
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:101 0-15
    ⊞ Media Description, name and address (m): audio 23394 RTP/AVP 18 101
    ⊞ Media Attribute (a): ptime:20
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:101 0-15
```

Outbound Call from IP-PBX (3/7)

(2) 407 Proxy Authentication

```
⊞ Status-Line: SIP/2.0 407 Proxy Authentication Required
⊟ Message Header
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>;tag=a4a109cc-13c4-4bb0669a-27433f01-4d79c76
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 84 INVITE
    Proxy-Authenticate: Digest realm="sip.skype.com", nonce="4bb066b80001781bc891b9609d299d2022c6c16fb79e8c19", algorithm=MD5
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca484
    Content-Length: 0
```

Outbound Call from IP-PBX (4/7)

(3) ACK

```
⊞ Request-Line: ACK sip:827079510919@sip.skype.com SIP/2.0
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca484
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>;tag=a4a109cc-13c4-4bb0669a-27433f01-4d79c76
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 84 ACK
    Content-Length: 0
    Max-Forwards: 70
```

Outbound Call from IP-PBX (5/7)

(4) INVITE

```
⊞ Request-Line: INVITE sip:827079510919@sip.skype.com;transport=udp;maddr=204.9.161.164 SIP/2.0
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca485
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 85 INVITE
    Supported: replaces, timer, 100rel, early-session
    Min-SE: 1800
    Date: Mon, 29 Mar 2010 17:36:38 GMT
    Session-Expires: 1800
    User-Agent: AddPac SIP Gateway
  ⊞ Contact: <sip:99051000003457@60.196.6.77>
    Accept: application/sdp
    Proxy-Authorization: Digest username="99051000003457", realm="sip.skype.com", nonce="4bb066b80001781bc891b9609d299d2022c6c16fb79e8c19",
    Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, UPDATE, PRACK, REFER, NOTIFY, INFO
    Content-Type: application/sdp
    Content-Length: 449
    Max-Forwards: 70
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): 99051000003457 1269884196 1269884196 IN IP4 172.17.101.240
      Session Name (s): AddPac Gateway SDP
    ⊞ Connection Information (c): IN IP4 172.17.101.240
    ⊞ Time Description, active time (t): 1269884196 0
    ⊞ Media Description, name and address (m): audio 23394 RTP/SAVP 18 101
    ⊞ Media Attribute (a): ptime:20
    ⊞ Media Attribute (a): crypto:1 AES_CM_128_HMAC_SHA1_80 inline:WzF4/tpRiWLdXEzcioXzodDOOffSwJXMzmE7wrAX
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:101 0-15
    ⊞ Media Description, name and address (m): audio 23394 RTP/AVP 18 101
    ⊞ Media Attribute (a): ptime:20
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:101 0-15
```

Outbound Call from IP-PBX (6/7)

(5) 180 Ringing

```
⊞ Status-Line: SIP/2.0 180 Ringing
⊟ Message Header
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>;tag=a4a109cc-13c4-4bb0669a-27433f01-4d79c76
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 85 INVITE
    User-Agent: sipgw-1.0
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca485
  ⊞ Contact: <sip:827079510919@sip.skype.com:5060;maddr=204.9.161.164;transport=udp>
    Content-Length: 0
```

Outbound Call from IP-PBX (7/7)

(6) 200 OK

```
⊞ Status-Line: SIP/2.0 200 OK
⊟ Message Header
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>;tag=a4a109cc-13c4-4bb0669a-27433f01-4d79c76
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 85 INVITE
    Allow: INVITE,ACK,CANCEL,OPTIONS,BYE
    User-Agent: sipgw-1.0
    Via: SIP/2.0/UDP 60.196.6.77:5060;branch=z9hG4bK964b554ca485
  ⊞ Contact: <sip:827079510919@sip.skype.com:5060;maddr=204.9.161.164;transport=udp>
    Content-Type: application/sdp
    Content-Length: 220
⊟ Message body
  ⊟ Session Description Protocol
      Session Description Protocol Version (v): 0
    ⊞ Owner/Creator, Session Id (o): 99051000003457 1269884196 1269884196 IN IP4 204.9.161.164
      Session Name (s): Skype call
    ⊞ Connection Information (c): IN IP4 204.9.161.164
    ⊞ Time Description, active time (t): 0 0
    ⊞ Media Description, name and address (m): audio 24068 RTP/AVP 18 101
    ⊞ Media Attribute (a): rtpmap:18 G729/8000
    ⊞ Media Attribute (a): rtpmap:101 telephone-event/8000
    ⊞ Media Attribute (a): fmtp:18 annexb=no
```

(7) ACK

```
⊞ Request-Line: ACK sip:827079510919@sip.skype.com;transport=udp;maddr=204.9.161.164 SIP/2.0
⊟ Message Header
    Via: SIP/2.0/UDP 60.196.6.77;branch=z9hG4bK964b554ca485
  ⊞ From: <sip:99051000003457@sip.skype.com>;tag=964b554ca4
  ⊞ To: <sip:827079510919@sip.skype.com>;tag=a4a109cc-13c4-4bb0669a-27433f01-4d79c76
    Call-ID: 9666b04b-146c-556e-804c-0002a4ff4869@60.196.6.77
    CSeq: 85 ACK
    Content-Length: 0
    Max-Forwards: 70
```

Thank you!

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Sales and Marketing

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