ST20XX SIP
New Features
(SG vx.66.2)

Contents

1 Overview

This document describes a set of features included in ST2030 and S2022 SIP v1.66.2 and 3.66.2 respectively in order to improve their usability in different environments.

2 Transfer On ringing

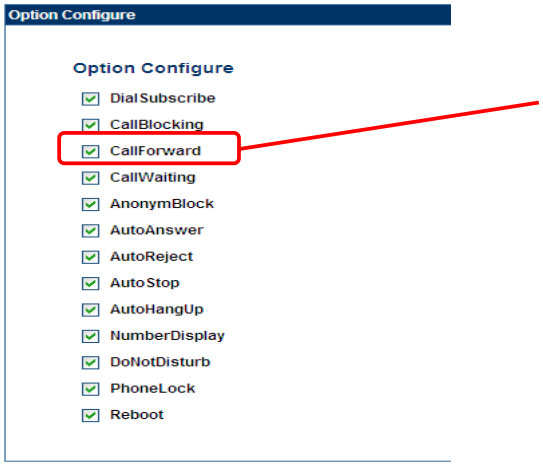
[Transf] softkey should be able to show on ringing in MMI selectively with/without respect to the CallForward bit in parameter "OptionVisible".

Current implementation

Since x.61, [Transf] softkey enable/disable on ringing in MMI with respect to the call forward bit in parameter "OptionVisible" accordingly.

In other words,
CallForward bit in parameter "OptionVisible" = 1 ➔ [Transf] softkey on ringing shows on the screen.

CallForward bit in parameter "OptionVisible" = 0 ➔ [Transf] softkey on ringing NOT shows on the screen.



[Transf] softkey enable/disable on ringing in MMI is directly followed the activation / deactivation of callforward bit accordingly.

New Implementation

A new parameter in Common and MAC configuration files is added to increase the flexibility to assign the [Transf] softkey on ringing shown in MMI with/without respect to the call forward bit in parameter "OptionVisible" accordingly.

TransfOnRingFlag =<0/1>, 0 is disable (by default), 1 is enable

TransfOnRingFlag = 0, [Transf] softkey is always enable without respect to the call forward bit in parameter "OptionVisible.

TransfOnRingFlag = 1, [Transf] softkey with respect to the call forward bit in parameter "OptionVisible" enable/disable. (Same as the current implementation above)

Table below describes the Enable/Disable of the [Transf] softkey on Ringing with Call forward bit in "OptionVisible".

	Call forward bit in "OptionVisible" = 0	**Call forward bit in "OptionVisible" = 1**
TransfOnRingFlag = 0	Enable	Enable
TransfOnRingFlag = 1	Disable	Enable

2.1 Feature Activation

A new parameter is needed to configure this function and with some additional definitions listed below.

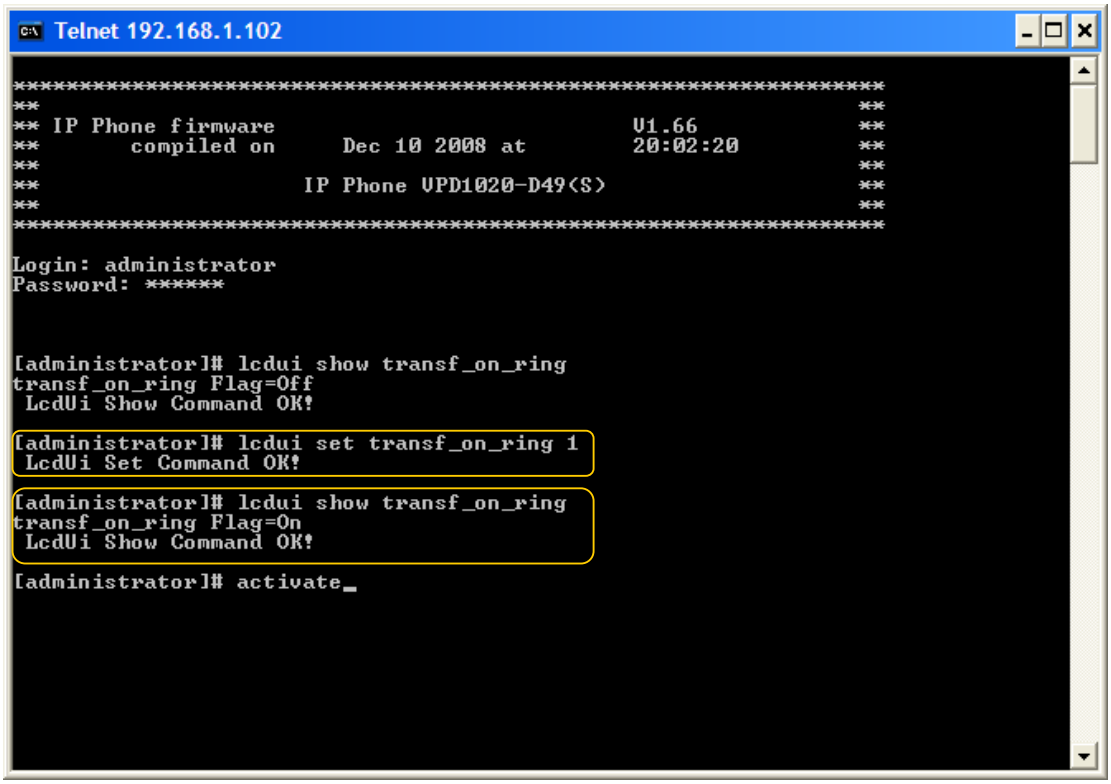
A. Via APS:

APS in [ipp] section of both Common and Specific-MAC config files with the new parameter:

```
[ipp]
…
OptionVisible=8191
TransfOnRingFlag =0          //by default, transfer on ringing is always enabled
…….
```

B. Via Telnet

To configure, open a command line console, and telnet the phone:



3 Call-hold “inactive” method

To enhance the compatibility with different softswitches, a new call-hold method is introduced in this section.

Current implementation

Currently, ST20xx implements “**send-only**” method for holding a call, carried in SDP session.

```
Content-Type: application/sdp
Content-Length: 221

v=0
o=2215 1325412 1325413 IN IP4 192.168.1.102
s=-
c=IN IP4 192.168.1.102
t=0 0
m=audio 41000 RTP/AVP 18 96
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:96 telephone-event/8000
a=fmtp:96 0-15
a=sendonly
```

Now, an alternative new call-hold method “**inactive**” has implemented in ST20xx to enhance the compatibility working on different softswitches.

```
Content-Type: application/sdp
Content-Length: 221

v=0
o=2215 1807412 1807413 IN IP4 192.168.1.102
s=-
c=IN IP4 192.168.1.102
t=0 0
m=audio 41000 RTP/AVP 18 96
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:96 telephone-event/8000
a=fmtp:96 0-15
a=inactive
```

3.1 Feature Activation

A new parameter is needed to configure this function and with some additional definitions listed below.

call_hold_method=<0|1>, 0 is by default
call_hold_method=0, "send-only" call-hold method is used
call_hold_method=1, "inactive" call-hold method is used

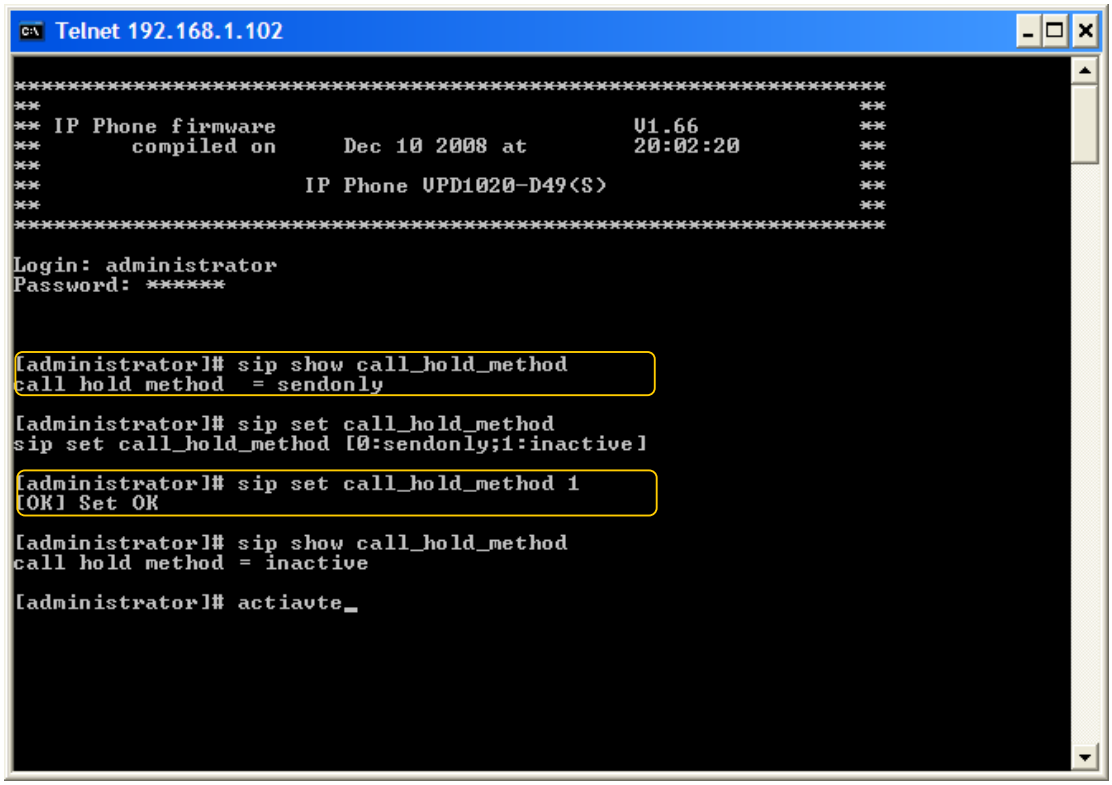
A. Via APS:

APS in [sip] section of both Common and Specific-MAC config files with the new parameter:

```
[sip]
…
call_hold_method=0          // by default, "send-only" is in use
……
```

B. Via Telnet

To configure, open a command line console, and telnet the phone:



4 Comverse: Line and Service supervision (reg & ua-profile event package)

The purpose of this feature is to increase the ability of ST20xx to request and monitor the registration status, change user profile and receive notifications related to a set of services of other supervised SIP phones in Comverse environment, like:

- DND activation status
- Call Forward activation status
- Etc…

Busy Line Field (BLF)

Dialog event supervision

User-oriented BLF has already supported in ST20xx. In Comverse environment, this feature allows monitoring other line status, and speed dialing.

For each supervised phone, ST20xx generates an initial SUBSCRIBE request to the SIP server in order to be notified for the state of all dialogs for this specific agents.

Then, the network generates a NOTIFY request on any dialog update for the supervised PUI. The dialog states are « **Early** », « **Confirmed** » and « **Void** » (state not provided).

Upon reception of a NOTIFY request, the ST20xx updates the lamp associated to the supervised phone accordingly.

For User-oriented BLF service, please refer to the *ST20xx SIP New Features SG vx.52.1.doc*

Registration event supervision with DND

One new feature is added in St20xx for working in Comverse environment. This feature allows ST20xx to monitor other line registration status with DND of the supervised phones.

For each supervised phone, ST20xx generates an initial SUBSCRIBE request to the SIP server in order to be notified for the state of all registrations for this specific phone.

Afterwards, the network generates a NOTIFY request on any registration update for the supervised PUI. The registration states are « **Registered** » and « **Unregistered** ». The service variable for DND supervision will be discussed in next section.

Upon reception of a NOTIFY request, ST20xx update the lamp associated to the supervised phone accordingly.

Implementation and configuration

Table below describes an overall ST20xx's behavior that is used for implementation, based on the **Dialog** and **Registration** and **DND supervision** of a same target:

DND state	Registration State	Dialog state	Aggregated state	Lamp state	When BLF Key is pressed
Off	Registered	Void	Free	Off	Call initiate
		Early	Ringing	Blinking fast	Call pick up
		Confirmed	Busy	On	Call initiate
	Unregistered	Any	Not available	Blinking slow	No action
On	Any	Any	Not available	Blinking slow	No action

If user presses the function Key:

- BLF Key is pressed in **OFF** state --> phone initiates a call toward the supervised SIP-URI
- BLF Key is pressed in **STEADY ON** state --> phone initiates a call toward the supervised SIP-URI
- BLF Key is pressed in **BLINKING SLOW** state --> NO action is taken
- BLF Key is pressed in **BLINKING FAST** (supervised phone is ringing) state --> phone launches a call Pickup of the supervised phone

Call pickup is launched by initiating a call toward a service code that includes the number to pickup. It can work with Soft Key or with Function key (user orientated BLF)

For call pick up service, please refer to "St20xx SIP New Features SG vx.62.pdf" → How to activate call Pick-up Service.

Remark:
If the status of the phone is in ringing, in communication and all others, except idle, function key should remain inactive if the user presses them.
But, the supervision (LED blinking or other, including state change) should remain active during call.

Service variable supervision

Now, ST20xx has already implemented the service variable supervision, the "ua-profile" event package is supported. But working in Comverse environment, this feature has been enhanced, which not only allows supervising phone itself, but also supervised with other phones.

The service allows ST20xx to be periodically notified about the state of a set of services implemented by the network. As mentioned before, those are

- DND activation status
- Call Forward activation status
- Etc…

There are three stages for the profile delivery process, including **Enrollment**, **Content retrieval** and **Change notification**. This document will not go into detail. For more information, please refer to "St20xx SIP New Features SG vx.62.pdf".

The service variables are defined in the below table:

Name	Possible values	Description
cfu_on	Integer: { 0, 1 }	Activation state of the Unconditional Call Forward. 0 means deactivated. 1 means activated.
dnd	Integer: { 0, 1 }	Activation state of the Do Not Disturb feature. 0 means deactivated. 1 means activated.
sf_on	Integer: { 0, 1 }	Activation state of the Secretarial Filtering feature. Applicable only when a Manager line is supervised. 0 means deactivated. 1 means activated.
hg_rdy	Integer: { 0, 1 }	Indicates whether the CPE that initiated the supervision is ready on the supervised Hunt Group. Applicable only when a Hunting Group virtual line is supervised. 0 means not ready. 1 means ready.

Where,

CallFwd service is linked to "cfu_on" variable
DND service is linked to "dnd" variable
SecFilter service is linked to "sf_on" variable
HuntGroup service is linked to "hg_rdy" variable

When ST20xx receives the SIP NOTIFY message, indicating successful profile enrollment, it makes it effective immediately and displays service status to the user. The duration of the subscription is 3600 by default.

Implementation and configuration

One function key will be affected to each service. Depending on the state of the service, the corresponding function key's LED will be turned ON or OFF.

Referring to the above table, two status of service variable are well defined:

0 means Deactivation state
1 means Activation state

Table below describes lamp state with the corresponding variable state.

Variable State	Lamp state
0	Off
1	On

Service supervision is associated to a key of the phone; ST20xx provides the ability to change the variable state by pressing the key. In all cases, it exists one couple of activation/deactivation for each supervised service of the supervised phone.

Activation and deactivation consists in initiating a basic call toward the corresponding supervised phone, where the phone used depends on the current status of the service.

Table below describes the two services which are used for activation/deactivation for the supervised phone in Comverse environment.

Services	Variable State	Lamp state	When key is pressed	FCA
Secretarial Filtering	0	OFF	INVITE sip: *270x*@domain.com SIP/2.0 From: <…> To: <sip:*270x*@domain.com> (Where x is the phone number of manager)	*270x*
	1	ON	INVITE sip: *271x*@domain.com SIP/2.0 From: <…> To: <sip:*271x*@domain.com> (Where x is the phone number of manager)	*271x*

Hunting Group	0	OFF	INVITE sip: *70x#@domain.com SIP/2.0 From: <…> To: <sip:*70x#@domain.com> (where x is the hunt group extension)	*70x#
	1	ON	INVITE sip: *71x#@domain.com SIP/2.0 From: <…> To: <sip:*71x#@domain.com> (where x is the hunt group extension)	*71x#

Remark:

- **Call Forward**: it is only possible to activate/deactivate for the self phone. Not support for the supervision of other phone in this case.

- **DND**: it is also only possible to activate/deactivate for the self phone. Not support for the supervision of other phone in this case.

- **SecFilter**: it is supported to activate/deactivate for the supervised phone. The typical use case allows a secretary to have information on his/her phone by using a LED of the activation status of the Secretarial Filtering on the Line of the Boss. By pressing the feature key, secretary can change the activation status of the secretarial filtering on the boss line.

- **HuntGroup**: it is supported to activate/deactivate for the supervised phone The typical use case allows a Hunting Group Member to have information on his/her phone by using a LED of his/her logon status regarding in a given Hunting Group. By pressing the feature key, member can change the logon status in this Hunting Group.

4.1 Feature Activation

Below is the typical example, including the supervision of self phone and other phones, with making use of the governed parameters below:

- A (2001) is the self-phone number.
- B (2003 ~ 2005) supervised phone lines
- D (2007) is the Boss phone number
- E (2022) is the Hung group number

FK1 & FK2: Line

FK3 to FK4: Use to supervise others phone with dialog, registration and DND services (Supervised phones: 2003 to 2004)

FK5 to FK6: Use to monitor the status of CFW and DND of the supervised phone (Supervised phones: 2005)

FK7: CFU (Self Phone) LED indicates ON/Off, Press Key for activation or Deactivation depends on the current status of the service.

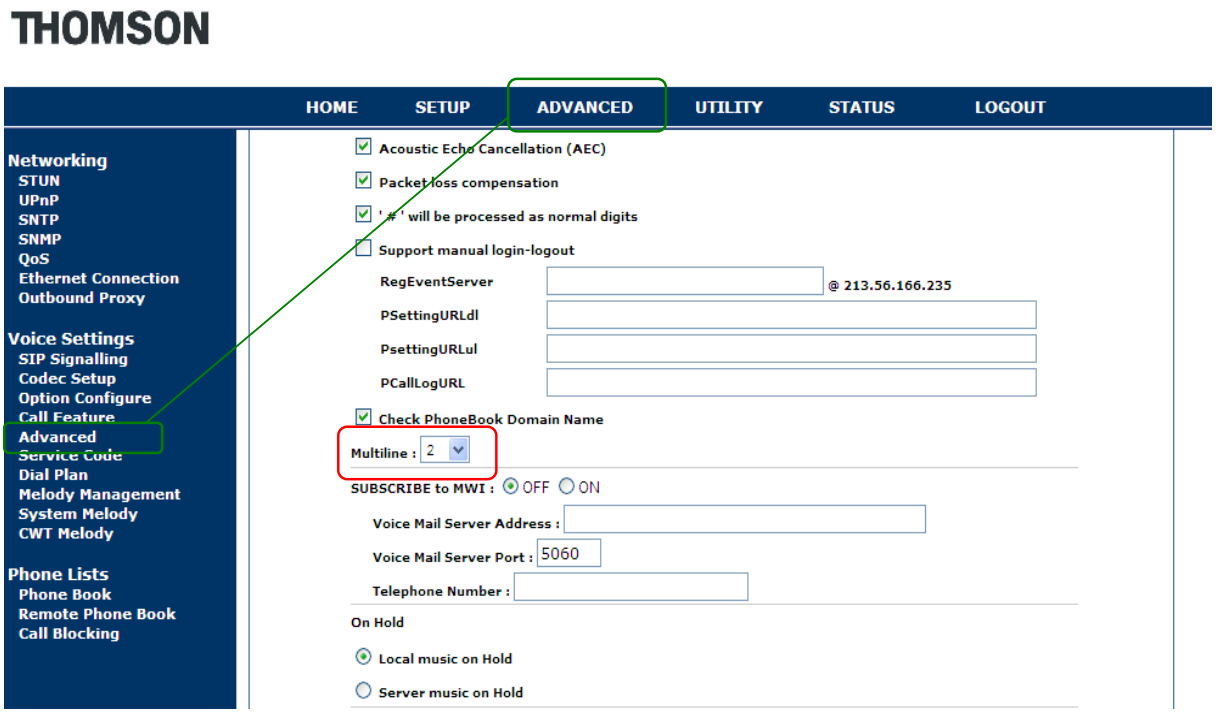
FK8: DND (Self Phone) LED indicates ON/Off, Press Key for Activation or Deactivation depends on the current status of the Service.

FK9: Use to supervise other phone with SF service. LED indicates ON/Off, Press Key for Activation or Deactivation depends on the current status of the Service.

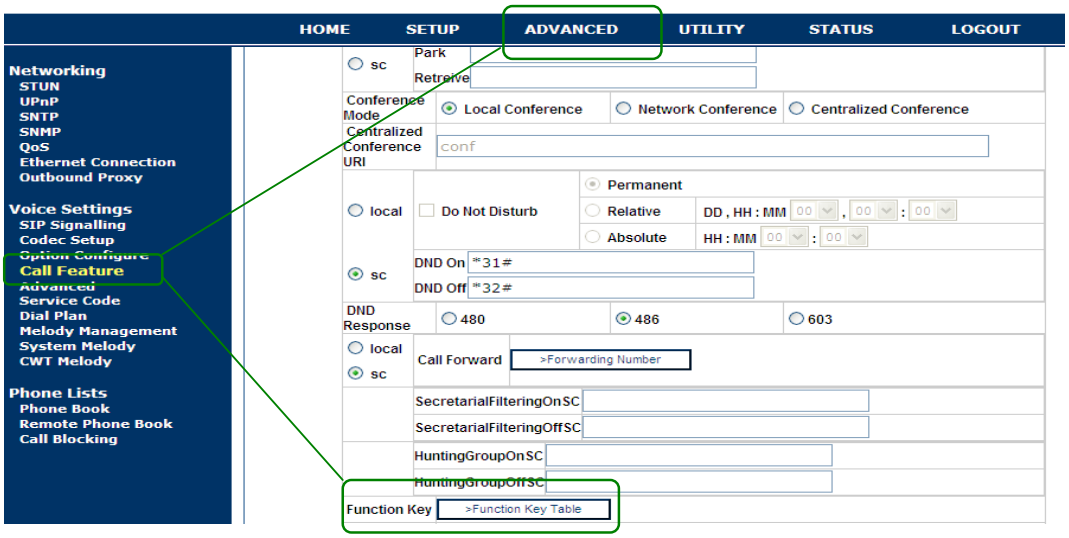
FK10: Use to supervise other phone with HG service. LED indicates ON/Off, Press Key for Activation or Deactivation depends on the current status of the Service.

A. Via WebGui:

Firstly, it is required to reduce the number of Multiline to reserve the number of supervised lines in Function Key, in Advanced → Advanced. Change the Multiline to be 2 and apply.



Then, you should go to Function key table through Advanced → Call feature → Function Key table.

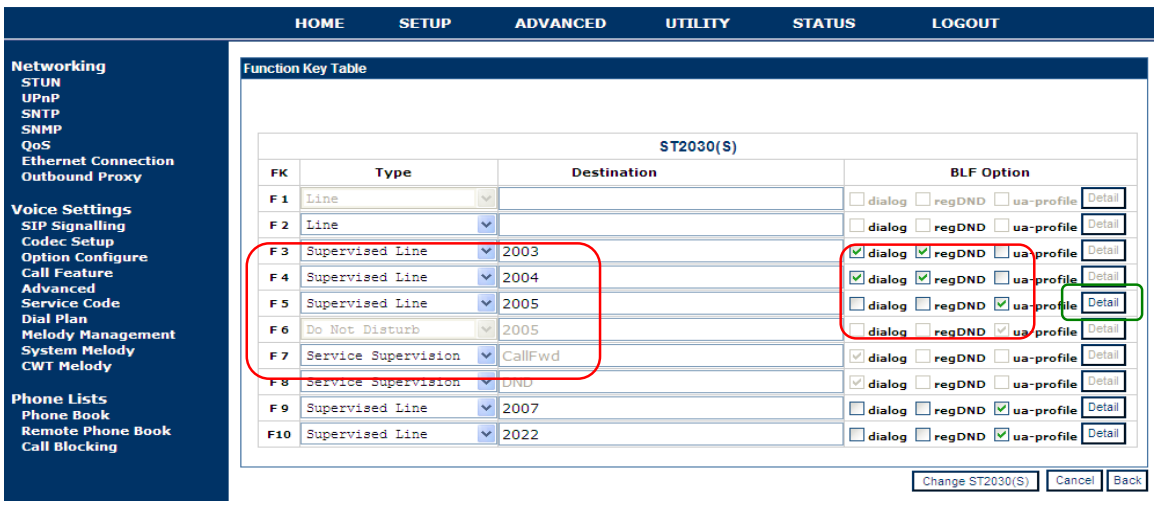


Select the item in the roll down "Type" menu: **Supervised Line** and enter the supervised phone numbers in the corresponding field of the function keys.

In this case, the function keys 3 to 4 will monitor the dialog, registration with DND service for the corresponding supervised phones. Therefore, the boxes for **dialog** and **regDND** for each supervised phones are checked.

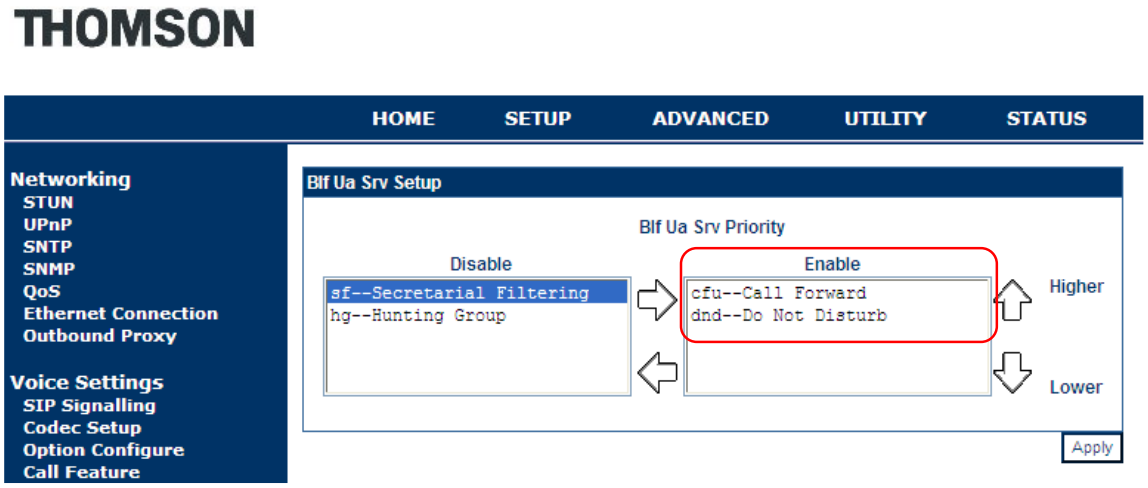
Likewise, the function key 5 is to monitor the status of CFW and DND of the supervised phones, the **ua-porfile** option must be checked. Click the Change ST2030(S) to apply.

Then, click the **Detail** button to go into the sub-menu of the **ua-profile**



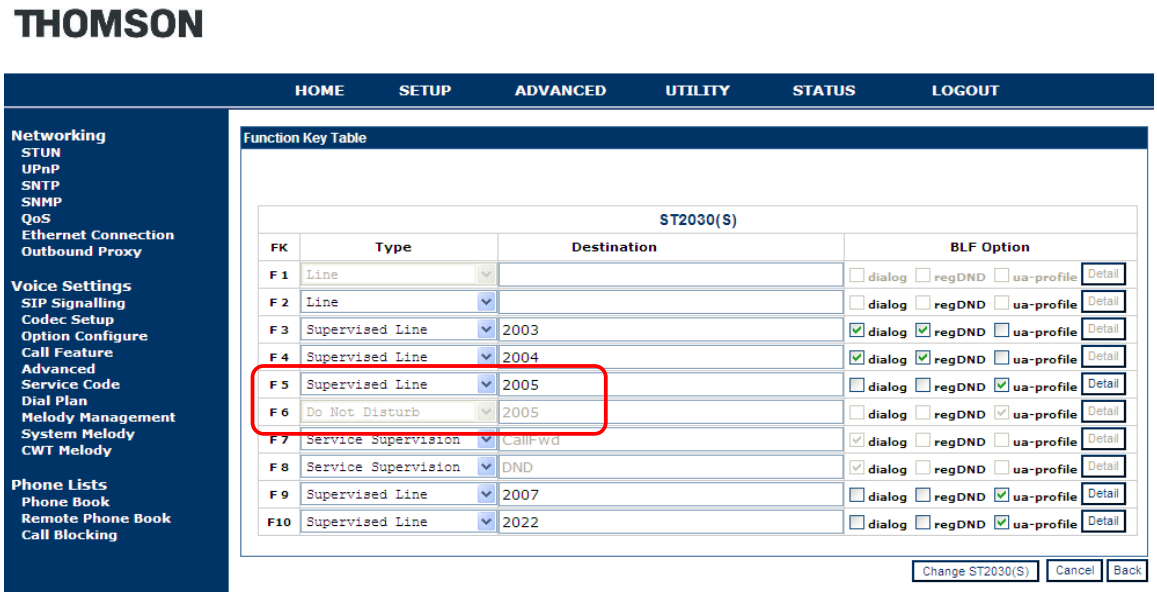
Enable the **cfu- Call Forward** and **dnd - Do Not Disturb** services by highlighting the service and click the right arrow. Then, click Apply.

For Feature Key 9 and 10, the procedures are the same.



You can also press the up and down arrow to change the priority for the enabled service. The priority is to decide which services would be used to the first assigned function key. The higher the priority, the first assigned function key will be used.

Therefore, the below feature key 5 is assigned with Call forward service and feature key 6 is assigned with DND.



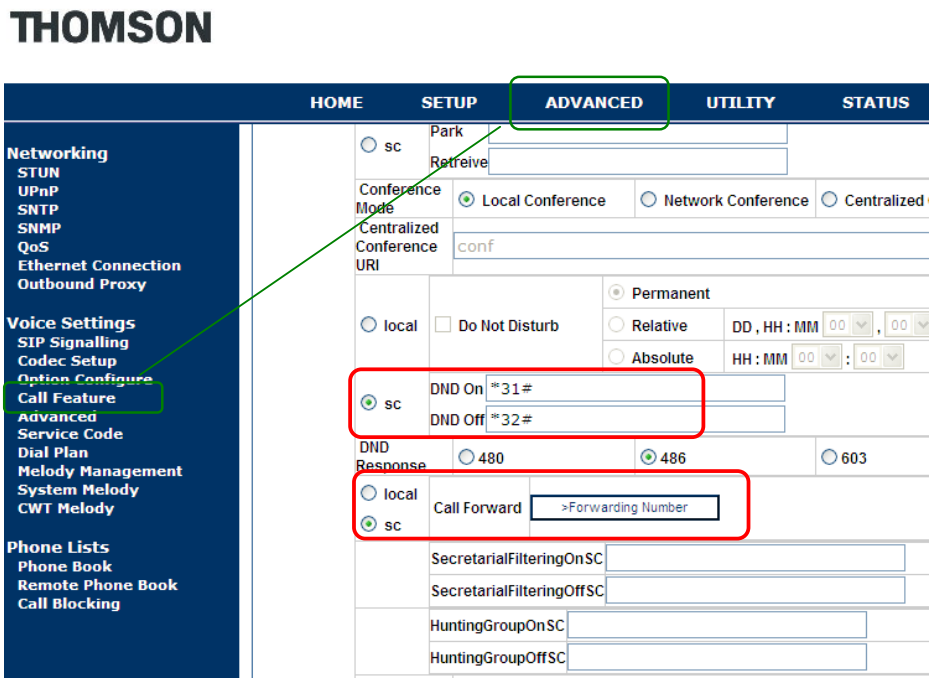
For the configuration of service supervision of self-phone, it only can be done by APS. Besides, it cannot be modifiable thought neither the MMI nor the WebGui.

One of the important topics need to be mentioned is the configuration of the starcode.

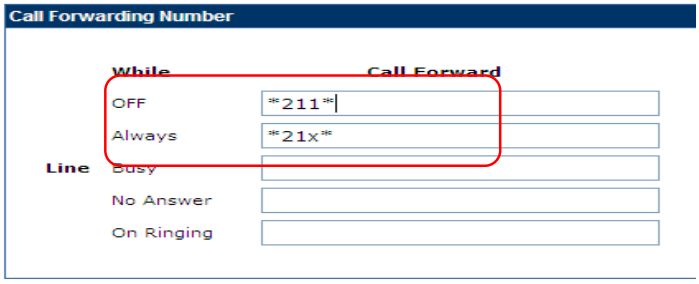
In this example, there are several starcodes involved. This document will give a brief description and make use of the startcodes working in Comverse environment. For more detail, please refer to "*ST20xx SIP New Features SG vx.62.pdf*"

Remark:
Now, if the Starcodes are used for self-phone, those will be denoted by SC. While, if the Starcodes are used for supervised phones, which will be denoted by SV.

Then, go to Advanced → Call feature; enter the Starcode for **DND On/Off** and **Call Forward**.

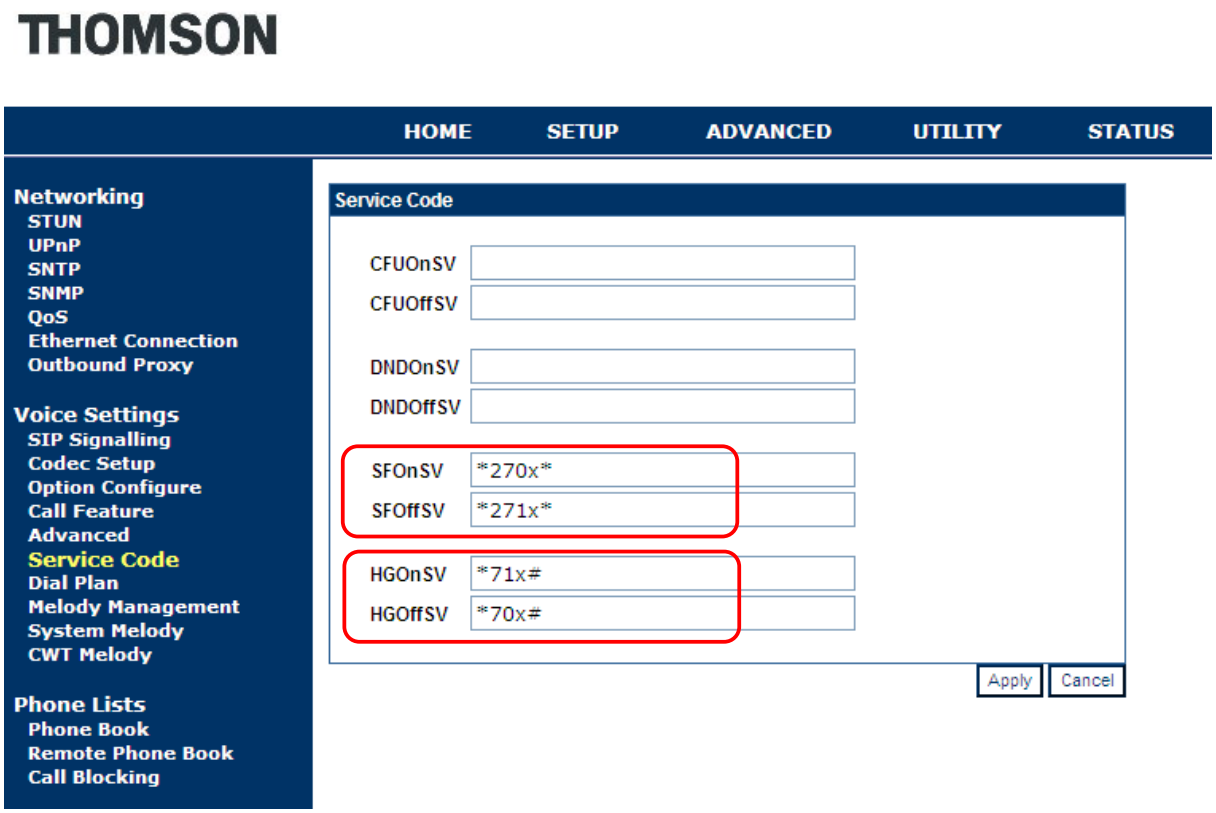


Under the **call forward** sub-menu, enter the starcode for Call-forward OFF and call-forward Always ON for the couple of activation/deactivation of the service. x is represented the phone number, which the self-phone forwarded to.



A new page is added called **Service code** in Advanced -> Service code. All the Starcode, which are used for monitoring to the supervised phones will be put there and be denoted by SV.

Enter the starcodes for **SFOnSV** , **SFOffSV**, **HGOnSV** and **HGOffSV** respectively and Apply.



B. Via APS:

In order not to conflict with the original user-oriented BLF, a new parameter will be added in Common and MAC configuration files to enable the feature of line supervision of registration and service supervision for each function key.

The existing parameters for user-oriented BLF will be used:

Current_Max_Multiline=10 (default)
FeatureKeyExtXX =S/<sip:xxxx>

New parameter:
FeatureKeyOptXX=Dialog(1)regDND(0)ua-profile(0:cfu(0)dnd(0)sf(0)hg(0)),

Where,

0 is disable, 1 is enable
XX is the number function keys used with supported extension modules, from Ext 01~ 66.

Dialog	–	current BLF (Dialog only)
regDND	-	registration status with DND
cfu	-	Un-conditional call forward
dnd	–	Do Not Disturb
sf	-	Secretary filter
hg	–	Hunted group

Default setting:
FeatureKeyOptXX=dialog(1)regDND(0)ua-profile(0:cfu(0)dnd(0)sf(0)hg(0))

```
[sys]
…
Current_Max_Multiline=2
FeatureKeyExt03 =S/<sip:2003>
FeatureKeyExt04 =S/<sip:2004>
FeatureKeyExt05 =S/<sip:2005>
FeatureKeyExt09 =S/<sip:2007>
FeatureKeyExt10 =S/<sip:2022>

FeatureKeyOpt03=dialog(1)regDND(1)ua-profile(0:cfu(0)dnd(0)sf(0)hg(0))
FeatureKeyOpt04=dialog(1)regDND(1)ua-profile(0:cfu(0)dnd(0)sf(0)hg(0))
FeatureKeyOpt05=dialog(0)regDND(0)ua-profile(1:cfu(1)dnd(1)sf(0)hg(0))
FeatureKeyOpt09=dialog(0)regDND(0)ua-profile(1:cfu(0)dnd(0)sf(1)hg(0))
FeatureKeyOpt10=dialog(0)regDND(0)ua-profile(1:cfu(0)dnd(0)sf(0)hg(1))
…
ServiceSupervisionStart=7
ServiceSupervisionOrder=CallFwd(1)DND(2)SecFilter(0)HuntGroup(0)
```

```
….

[sip]
….
CallFwdFlg=sc                          // StartCode for call forward (self phone)
CallFwdOffSC=*211*
CallFwdAlwaysSC=*21x*
DNDFlg=sc                              // StartCode for DND (self phone)
DNDOnSC=*31#
DNDOffSC=*32#
SFOnSV=*270x*                          // StartCode for SF (supervised phone)
SFOffSV=*271*
HGOnSV=*71x#                           // StartCode for HG (supervised phone)
HGOffSV=*70x#
…
```

Remark:

- The default sequence of ua-profile can be changed, like dnd(0)cfu(0)hg(0)sf(0)
- ua-profile value should be set to 1 in order to activate the services supervision.
- 0 for disable, default value; 1 for enable; any other value(except 0 or 1) or empty is considered as disable
- if duplicated, cfu(0)cfu(1)dns(0)sf(0)hg(0), the first one is valid.

C. ***Via Telnet:***

Below shows some significant telnet commands for this case. For more information, please refer to *ST20XXS_Config File Syntax_V0034.pdf*.

1. Set the function key to be **Supervised line** with phone number

```
[administrator]# sys set fk 3 S/<sip:2003>
[OK] Set OK
```

2. Enable the line supervision and service supervision

```
[administrator]# sys show fk_blf_opt 3

Feature Key BLF Option[ 3] :dialog=Enable; regDND= Disable;ua-profile= Disable

[administrator]# sys set fk_blf_opt 3 1 0 0
```

3. Enter the starcodes flag with starcode

```
[administrator]# sip set DNDFlg sc
[OK] Set OK

[administrator]# sip set DNDOnSC *31#
[OK] Set OK

[administrator]# sip set DNDOffSC *32#
[OK] Set OK
```

5 Comverse: Redirecting identity and name presentation

Currently, the ST20xx do not support the "display-name" string of the Diversion header.

With working in Comverse environment, the feature of redirecting identity and name presentation allows its displays on the terminating phone. And the redirecting identity and name information is received on the initial INVITE request.

Therefore, this section is to address the implementation of the redirecting identity in ST20xx.

Let see the below example:

A (calling): 84000532 "Alice"

B (redirecting): 81000541 "Bob the Manager"

C (called): 84000531 "Assistant"

For a basic incoming call, ST20xx will receive the following SIP INVITE message:

Initial INVITE from NETWORK received by C:

```
INVITE sip:84000531@10.165.2.31:5060 SIP/2.0
Via: SIP/2.0/UDP 10.165.2.200:5060;branch=z9hG4bK4901036f-6756-5198
Call-Id: CI_375_84000531_120
From: "Alice" <sip:84000532@10.165.2.200:5060>;tag=10.165.2.200-6745-8537
To: <sip:84000531@10.165.2.31:5060>
Max-Forwards: 70
Allow: REGISTER, INVITE, BYE, ACK, CANCEL, REFER, INFO, OPTIONS, SUBSCRIBE
Session-Expires: 120
CSeq: 375 INVITE
Contact: <sip:84000532@10.165.2.200:5060>
Supported: timer
Diversion: "Bob the Manager" <sip:81000541@10.165.2.200:5060>
Content-Type: application/sdp
Content-Length: 217

SDP
```

There are three states need to be considered:

1. In Ringing (During call incoming) state

St20xx display the Caller and the Redirecting name alternatively on the screen, and the redirecting name will be displayed in reverse video. The time interval for the swap will be in 1 second.

If the diversion header has Redirecting party Name, phone should display "Bob the Manager", but if it doesn't have Redirecting party Name, phone should display Number "81000541".

2. In Talking state:

St20xx display the Caller name with number.

3. In Call log:

The call log list shows the detail of caller information.

Remark:
If the phone number of "Bob the manager" is saved in phone book, the display should show the name in the phone book.

Only top header is showed.

5.1 Feature Activation

3. Via APS:

A new parameter will be introduced to activate/deactivate the feature of redirecting identity and name presentation in [sip] section of both Common and Specific-MAC config files.

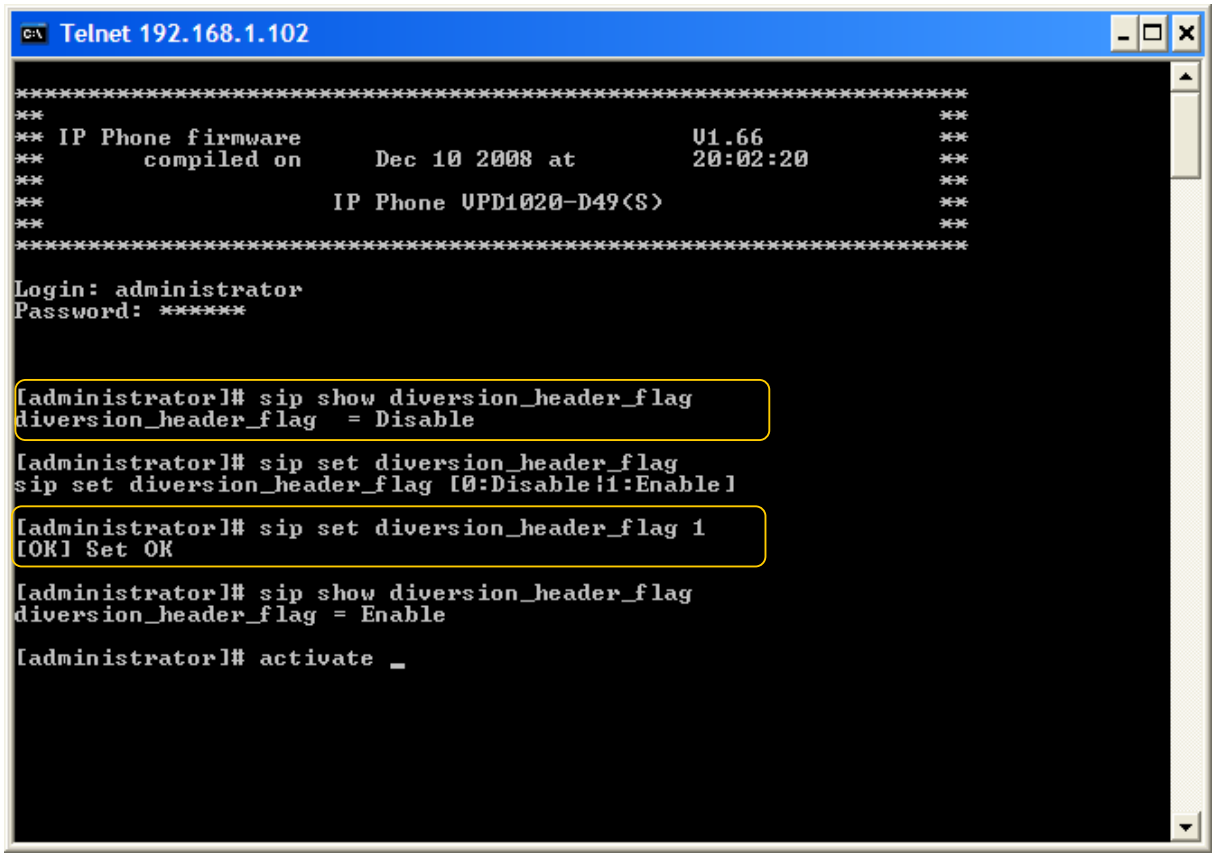
DiversionHeaderFlag= <0|1>,

Where, 0 is disable (default setting),
1 is enable

```
[sip]
…..
DiversionHeaderFlag =0              // by default, disable
DiversionHeaderFlag =1              // Diversion header is supported
…….
```

4. *Via Telnet*

To configure, open a command line console, and telnet the phone:



6 Star Codes (Ver 2)

Star Codes are currently supported in ST20xx. This section will all refer to the *ST20xx SIP New Features SG vx.62.pdf* and describe only the **new improvement** of Star Codes done in x.66.2 in order to increase the utility of the codes.

Things to know:

Star Codes will included phone numbers together, in-between or end, which the number is represented by x.

In other words, all "**SC + phoneNr/orbit Nr**" will be presented and replaced by "**SCx**".

If the phone number within the SC and ended with *, #, it allows to enter to add the x within the Star Code.

For instance:
For Call pick up service, if the SC is ***98**, you should enter ***98x** in CallPkupSC parameter. When the code is invoked, the phone number will be applied and provided end with the code.

For Call Forwards Always service, if the SC is ***21 + phone Nr + #**, you should enter ***21x#** in CallFwdAlwaysSC parameter. When the code is invoked, the phone number will be applied and provided within the code.

Therefore, below is the list of services, which the Star codes have to be changed by adding **x** in between or end, depends on the pattern of star codes.

1. Call Pick-up with soft key
2. Call Pick-up with Function Key (User oriented BLf)
3. Call Forward Always/Busy/No Answer through Keypad
4. Call Forward On Ringing through Soft Key
5. Call Retrieve soft Key
6. Other Special Service activation

Moreover, **two new services** have been implemented in this release and introduced below:

Things to know:

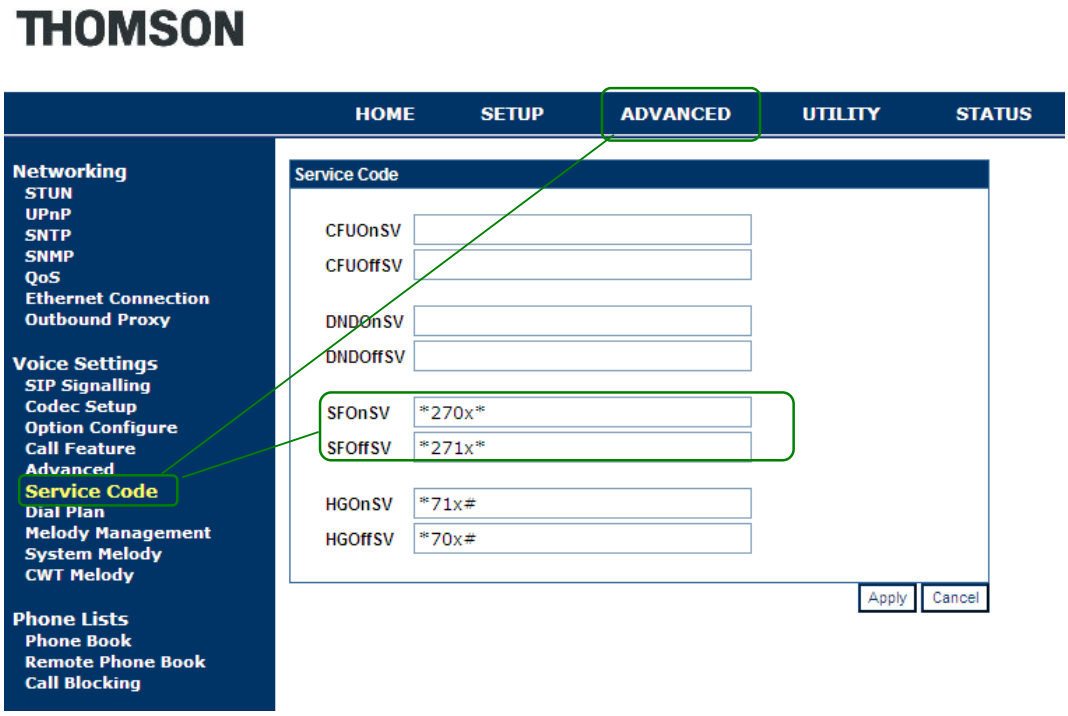
- A new page is added, called **Service Code**, in Advanced → Service Code.
- All Service codes in this page are used for the supervised phones.
- Star codes are used for supervised phones is denoted by **SV**.
- Star codes are used for self-phone is denoted by **SC**.

6.1 Secretarial Filtering with Function Key

Feature Activation

A. Via WebGui

The activation of this feature is accessible from the WebGui in the Advanced → Service Code section.



B. Via APS

For this purpose, new parameters have been added included in the [sip] section of the Common/Mac config files, to be able to configure the feature.

```
[sip]
SFOnSV=
SFOffSV=
```

C. *Via Telnet*

For this purpose, new parameters have been created, described as follow:

```
sip set SecretarialFilteringOnSV        // SFSV On Star Code
sip set  SecretarialFilteringOffSV      // SFSV Off Star Code
```

6.1. Behavior

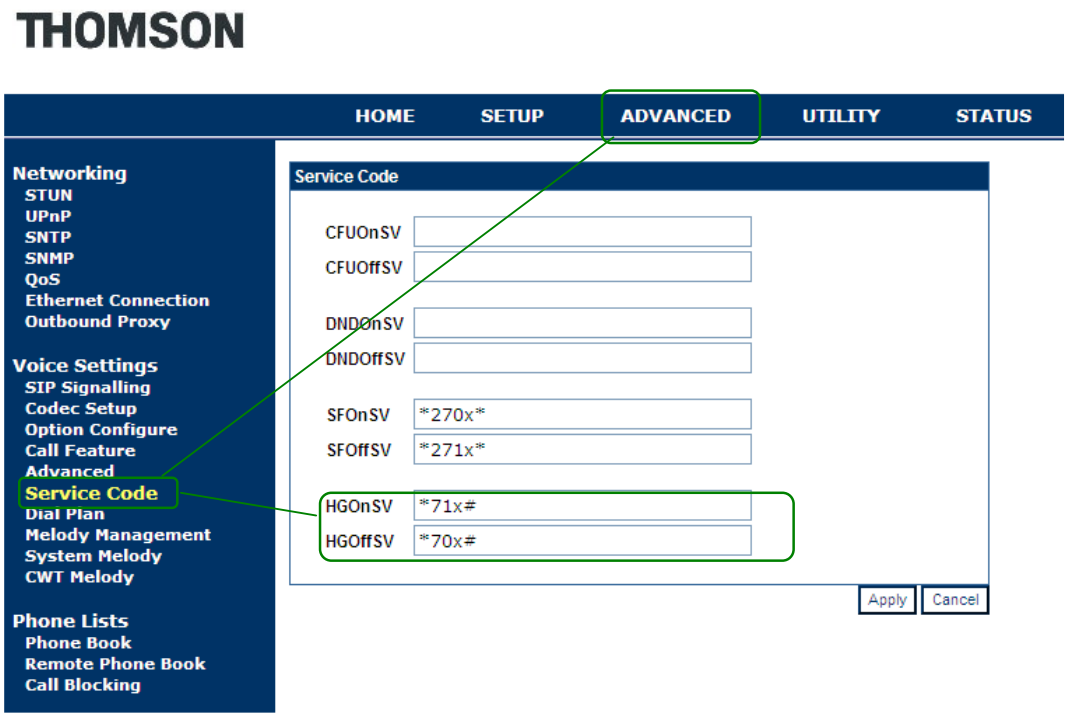
1. Function Key(FK) LED is used to supervise the service
2. In Idle/Standby, press FK when LED Off (Service is Off) → Phone sends SFOnSV
3. press FK when LED On (Service is On) → Phone sends SFOffSV
4. The phone must not attempt to send a SV when LED is Fast/Slow Blinking.
5. Null content means the service change is unavailable

6.2 Hung group with Function Key

Feature Activation

A. *Via WebGui*

The activation of this feature is accessible from the WebGui in the Advanced → Service Code section.



B. Via APS

For this purpose, new parameters have been added included in the [sip] section of the Common/Mac config files, to be able to configure the feature.

```
[sip]
HGOnSV=
HGOffSV=
```

C. Via Telnet

For this purpose, new parameters have been created, described as follow:

```
sip set HuntingGroupOnSV // HGSV On Star Code
sip set HuntingGroupOffSV // HGSV Off Star Code
```

6.2. Behavior

1. Function Key(FK) LED is used to supervise the service
2. In Idle/Standby, press FK when LED Off (Service is Off) → Phone sends HGOnSV
3. press FK when LED On (Service is On) → Phone Send HGOffSV
4. The phone must not attempt to send a SV when LED is Fast/Slow Blinking.
5. Null content means the service change is unavailable