

Python v telefonní ústředně

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"Zahrneme-li do telefonní
ústředny Python, pak tato
získá Turingovskou
výpočetní sílu..."

Konec

Děkuji za pozornost.

Co je to telefon?



Telefon?



Telefon?



Telefonní ústředna



Telefoni ústředna



Telefon!

VoIP

SIP - Session Initiation Protocol

RTP - Real-time Transfer Protocol

UA - User Agent

PBX - Private Branch eXchange

... a další TLA, xLA



VoIP

FXO, FXS, GXW, ISDN, ...



Telefon

Do světa

Jinam do světa

Demo

360 - MOH

361 - echo

365 - echo

363 - callerid

367 - miliwatt

1001, 1002, ...



FreeSWITCH config

```
The file will not play unless you have both TLS and SRTP active.
--> veros@shiny: ~ - Terminal
22183 Full      0      0 Error    28-Mar-13 08:12 misa-cepova-drive-c
22184 <extension name="hold_music"> 28-Mar-13 08:39 radek-pokorny-drive-c
  <condition field="destination_number" expression="^9664$"/>
  <condition field="${sip_has_crypto}" expression="^(AES_CM_128_HMAC_SHA1_32|AES_CM_128_HMAC_SHA1_80)$">
    <action application="answer"/>
    <action application="execute_extension" data="is_secure XML features"/>
    <action application="playback" data="$$${hold_music}"/>
    <anti-action application="set" data="zrtp_secure_media=true"/>
    <anti-action application="answer"/>
    <anti-action application="playback" data="silence_stream://2000"/>
    <anti-action application="execute_extension" data="is_zrtp_secure XML features"/>
    <anti-action application="playback" data="$$${hold_music}"/>
  </condition>
</extension> 1      168 OK      28-Mar-13 11:55 dalibor-janous-drive-c
e-d
  <extension name="laugh_break">
    <condition field="destination_number" expression="^9386$">
      <action application="answer"/>
      <action application="sleep" data="1500"/>
      <action application="playback" data="phrase:funny_prompts"/>
      <action application="hangup"/>
    </condition>
  </extension>

<!-- You can place files in the default directory to get included.
--&gt;
&lt;X-PRE-PROCESS cmd="include" data="default/*.xml"/&gt;
&lt;!--
&lt;extension name="refer"&gt;
  &lt;condition field="${sip_refer_to}"&gt;
    &lt;expression&gt;&lt;![CDATA[&lt;sip:${destination_number}@${domain_name}&gt;]]&gt;&lt;/expression&gt;
  &lt;/condition&gt;
  &lt;condition field="${sip_refer_to}"&gt;
    &lt;expression&gt;&lt;![CDATA[&lt;sip:(.*)@(.*)&gt;]]&gt;&lt;/expression&gt;
  &lt;/condition&gt;
&lt;/extension&gt;
--&gt;</pre>
```

XML



mod_python

```
#!/usr/bin/env python
import freeswitch
from freeswitch import *
SOUND_BASE = '/opt/freeswitch/sounds/prvocislo'

def handler(session, *args):
    n = 3
    while n:
        n -= 1
        session.execute('playback',
                        SOUND_BASE+'/enter.wav')
        digits = session.playAndGetDigits(5,5,3,15000,'#',
                                          SOUND_BASE+'/zadejte-prvocislo.wav',
                                          '', '')
        consoleLog('err', 'Entered "%s": \n' % digits)
        #
        if not digits:
            return
        is_valid = True
        digits = int(digits)
        for i in [2]+range(3,300,2):
            if digits % i == 0:
                is_valid = False
                break
        if is_valid:
            session.execute('send_dtmf', '00')
            session.execute('playback',
                            SOUND_BASE+'/je-prvocislo.wav')
            session.execute('sleep', '3000')
            return
        session.execute('playback',
                        SOUND_BASE+'/neni-prvocislo.wav')
        session.execute('sleep', '1000')

~ ~ ~ ~ ~
```

A k čemu je to dobrý?

A k čemu je to dobrý?

- IVR
- LCR
- CID
- GSM ringback
- callback

Cokoliv jiného!

- mluvící teploměr
- ovládání IP zařízení
- ovládání ne-IP zařízení
- CAPTCHA + redirect
- slevy na volání

Gotchas

- sys.stdout, sys.stderr
- exceptions
- provisioning
- hardware

Demo

351

Konec?

Děkuji za pozornost.