

Membuat SMS Gateway dgn Modem GSM Itegn0, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40



Membuat SMS Gateway sendiri memiliki tantangan yang cukup berat. Di internet sebenarnya telah tersedia banyak dokumentasinya, namun yang masih kurang adalah tutorial yang benar2 cocok untuk newbie. Setelah bergadang hampir 2 minggu akhirnya penulis berhasil menyetelnya. Berbeda dengan program SMS bawaan dari telepon genggam, dengan Kannel dan Playsms, kita bisa menjadikannya multi-user dan bisa diakses dari mana saja.

Pertama2 penulis ingin berterima kasih kepada semua rekan yang telah banyak membantu, terutamanya:

1. Developer modem Itegn0 yang telah memberikan daftar AT command modemnya.
2. Mas Anton Rahardja dan team yang telah menyediakan playsms dan bersedia ditanya2 jam 2 dini hari :)
3. Pak Adi Prasaja yang telah memberikan kunci2 settingan modem gsm.
4. Semua rekan2 yang telah baik hati berdiskusi, Mas Dave Muhammad, Mas Rist. Andy Nugroho, Arief Suherlan, dll
5. Oom Google dan Pakde Milist :)

Baiklah mari kita mulai. Hal2 yang diperlukan adalah:



1. Modem GSM. Dalam hal ini penulis menggunakan Itegn0 3000 yang menggunakan koneksi USB (<http://www.dsc.co.id/?page=category&catid=5&pid=120>).

Sebenarnya kita dapat pula menggunakan telepon genggam GPRS kita, tapi mungkin di lain artikel yah.

2. Kannel (<http://www.kannel.org>) sebagai sms engine.
3. Playsms (<http://playsms.sourceforge.net>) sebagai web-based Mobile Portal System.
4. Linux OS dgn MySQL, kali ini penulis menggunakan Fedora Core 4, dengan kernel terbaru 2.6.15-1.1830.
5. Kopi kental, roti bakar, dan mie instant sesuai selera sebagai teman bergadang :)

Langkah2 yang harus dilakukan adalah:

1. Mensetting Modem GSM.
2. Menginstall dan mensetup kannel.
3. Menginstall dan mensetup playsms.
4. Mentesting

A. Mensetting Modem GSM

Masukkan kartu GSM ke dalam modem GSM, dan jangan lupa pasang tutupnya. Sebab kalau tidak terpasang, modem tidak akan berfungsi dengan baik.

Hidupkan Linux, dan colokkan modem ke port USB.

Buka terminal, dan lakukan tail -f /var/log/messages. Di dalam /var/log/messages itu akan terlihat ini bila Linux berhasil mengenali modem GSM kita:

```
Feb 18 19:36:01 fc4 kernel: usb 2-2: new full speed USB device using uhci_hcd and address 3
Feb 18 19:36:01 fc4 kernel: usbcore: registered new driver usbserial
Feb 18 19:36:01 fc4 kernel: drivers/usb/serial/usb-serial.c: USB Serial support registered for
```

Membuat SMS Gateway dgn Modem GSM Iteqno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

generic

Feb 18 19:36:01 fc4 kernel: usbcore: registered new driver usbserial_generic

Feb 18 19:36:01 fc4 kernel: drivers/usb/serial/usb-serial.c: USB Serial Driver core

Feb 18 19:36:02 fc4 kernel: drivers/usb/serial/usb-serial.c: USB Serial support registered for pl2303

Feb 18 19:36:02 fc4 kernel: pl2303 2-2:1.0: pl2303 converter detected

Feb 18 19:36:02 fc4 kernel: usb 2-2: pl2303 converter now attached to ttyUSB0

Feb 18 19:36:02 fc4 kernel: usbcore: registered new driver pl2303

Feb 18 19:36:02 fc4 kernel: drivers/usb/serial/pl2303.c: Prolific PL2303 USB to serial adaptor driver

Secara fisik kita bisa melihat apakah Modem telah dikenali dengan baik dari lampunya yang berkedip2.

B1. Menginstall kannel.

Kita bisa menginstall dari source, ataupun dari binary. Tidak masalah. Menggunakan FC4, kita dapat menginstallnya dengan cara:

```
yum install kannel kannel-devel
```

Ia berada di dalam repository extras.

B2. Mensetup kannel.

Selanjutnya yang cukup sulit adalah mensetting kannel. Sangat disarankan kita mendownload dan mempelajari kannel userguide dari kannel.org. Playsms telah menyediakan settingan awal untuk kita, kita tinggal melengkapinya sesuai perlengkapan yang kita gunakan.

Berikut ini adalah file /etc/kannel.conf penulis:

```
# CORE
group = core
admin-port = 13000
admin-password = pwd
status-password = pwd
log-file = "/var/log/kannel/kannel.log";
log-level = 0
access-log = "/var/log/kannel/access.log";
smsbox-port = 13001
store-file = "/var/log/kannel/kannel.store";
```

```
# SMSC Fake
```

```
#group = smsc
```

```
#smsc = fake
```

```
#host = localhost
```

```
#port = 13013
```

Membuat SMS Gateway dgn Modem GSM Itegro, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

#SMSC modem gsm

```
group = smsc
smc = at
host = localhost
port = 13013
smc-id = linuxku
modemtype = wavecom
device = /dev/ttyUSB0
speed = 115200
sms-center = 0816124
```

```
group = modems
id = WAVECOM
name = wavecom
detect-string = WAVECOM
init-string = &quot;AT+CNMI=1,2,0,1,0;+CMEE=1&quot;
```

SMSBOX SETUP

```
group = smsbox
bearerbox-host = localhost
sendsms-port = 13131
sendsms-chars = &quot;0123456789+&quot;
log-file = &quot;/var/log/kannel/smsbox.log&quot;
log-level = 0
access-log = &quot;/var/log/kannel/access.log&quot;
```

SEND-SMS USERS

```
group = sendsms-user
username = playsms
password = pwd
```

SMS SERVICE 'Default'

there should be default always

```
group = sms-service
keyword = default
max-messages = 0
exec = /usr/local/bin/kannel_incoming %t %q %a
#get-url =
&quot;http://localhost/~playsms/plugin/gateway/kannel/geturl.php?t=%t&q=%q&a=%a&quot;
```

Penjelasan:

Bagian SMSC Fake kita comment out sebab dia berfungsi untuk testing saja. Kita tidak akan bisa mengirimkan sms yang sesungguhnya menggunakan SMSC Fake ini. Sebaliknya, kita definisikan group smsc modem gsm. sms-center juga kita sesuaikan dengan kartu gsm kita.

Membuat SMS Gateway dgn Modem GSM Iteqno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

Kita definisikan juga group modems. Yang penting disini adalah init-stringnya yaitu `"AT+CNMI=1,2,0,1,0;+CMEE=1"`, `CMEE=1` itu berarti kita menginstruksikan modem agar menyebutkan jenis error yang terjadi pada Mobile Equipment kita. Kalau tidak dibuat verbose, maka ketika terjadi error misalnya pulsa kita habis sehingga tidak bisa kirim sms, modem gsm kita cuma bilang error tapi tidak disebutkan kenapa, sehingga kannel tidak mengetahui error apa yang terjadi:

```
2006-02-18 10:20:46 [8984] [7] ERROR: AT2[/dev/ttyUSB0]: Error occurs: ERROR (error number not known to us. ask google and add it.)
```

Setelah dibuat verbose menjadi keliatan sebab errornya:

```
2006-02-18 10:25:20 [8984] [7] CMS ERROR: +CMS ERROR: 38 (Network out of order)
```

Kemudian yang juga penting adalah bagian `max-messages = 0` di group `sms-service`. Option `max-message = 0` ini berguna agar modem kita tidak mengirimkan reply ketika menerima sms. Sebab akan terjadi kesalahan yang sangat fatal yaitu looping send-receive, dimana jika kita mengirimkan sms ke diri sendiri, maka modem akan mengirimkan reply ke diri sendiri, dan selanjutnya reply ini akan di reply, begitu seterusnya, sampai pulsa kita habis.

Bagaimana kannel bekerja?

Kannel sebenarnya lebih dari sekedar sms engine, dia juga dapat berfungsi sebagai wap engine. Ada 3 komponen utama kannel, yaitu: `bearerbox`, `smsbox`, dan `wapbox`. `Bearerbox` ini adalah inti dari kannel. Dia berfungsi sebagai koordinator dari 2 komponen lainnya yaitu `smsbox` dan `wapbox`. Kira2 demikian deh :)

C. Menginstall dan mensetup playsms

Untuk lengkapnya, baca file `INSTALL` dari `playsms` yah! Berikut cuplikannya:

1. It is important to meet all minimum requiments above (Its a must!)
2. Setup a system user named 'playsms' to manage PlaySMS

```
# adduser playsms
# passwd playsms
```

Note: on some Linux distributions `adduser` and `passwd` combined
3. On most Linux distributions actions (2) will create system user and group named `playsms` with home directory `/home/playsms`, there you will install all PlaySMS files
4. Create `public_html` on user's home directory, if its not already exists

```
# mkdir /home/playsms/public_html
```
5. Extract PlaySMS package somewhere (Place in `/usr/local/src` if you want to)

```
# tar -zxvf playsms-x.x.x.tar.gz -C /usr/local/src
# cd /usr/local/src/playsms-x.x.x
```
6. Copy 'web' directory to `public_html` directory and set owner back to user `playsms` again (for security reason)

```
# cp -rR web/* /home/playsms/public_html
# chown -R playsms /home/playsms/public_html
```

Membuat SMS Gateway dgn Modem GSM Itegno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

- ```
chmod 701 /home/playsms
```
7. Setup database (import database)

```
mysqladmin -u root -p create playsms
```

```
mysql -u root -p playsms < /usr/local/src/playsms-x.x.x/db/playsms.sql
```

Note: you dont need to use MySQL root access nor this method to setup PlaySMS database, but this is beyond our scope, you should read MySQL manual's for custom installation method
  8. Edit config.php on playsms web directory (/home/playsms/public\_html/config.php)  
Please read and fill all required fields carefully
  9. Enter bin directory and copy playsmsd and playsmsd\_start to /usr/local/bin

```
cd /usr/local/src/playsms-x.x.x
```

```
cd bin
```

```
cp playsmsd playsmsd_start /usr/local/bin/
```
  10. Enter /etc/init.d or /etc/rc.d/init.d and look for file rc.local, im sure you'll found it. Edit that file and put `"/usr/local/bin/playsmsd_start"`; (without quotes) on the bottom of the file (before exit if theres exit). This way playsmsd\_start will be run everytime the system startup. You need 'root' access for this purpose.
  11. Browse <http://localhost/~playsms> and login using default administrator user  
username: admin  
password: admin
  12. At this point you should be able to logon PlaySMS webbased interface.  
Lets move on to gateway module part, the hard one :)

If you decide to use kannel gateway module, then you must install kannel on the same server where PlaySMS installed. There are discussion on hoto install Kannel on separate machine with PlaySMS.

Due to complexity of installation process for kannel, we decide to leave this module for experts. Well experts, there's something you should see on this package contrib/kannel/kannel.conf, sms service 'Default' part.

Dont forget to:

1. Create kannel cache directory and make it writable to the web servers user

```
mkdir /usr/local/cache
```

```
mkdir /usr/local/cache/smsd
```

```
chmod -R 777 /usr/local/cache
```

Note:

  - make it writable to the world (chmod -R 777) just to simplify installation
  - it is better if you know what is the web server's user (eg: 'nobody') and instead chmod -R 777 you use:

```
chown -R nobody /usr/local/cache
```
2. Create log directory

```
mkdir /var/log/kannel
```
3. Enter bin directory in this package, and copy kannel\_incoming to /usr/local/bin

## Membuat SMS Gateway dgn Modem GSM Iteqno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

---

If you decide to use kannel gateway module, but you dont want to use 'exec' method in sms service,  
just replace you kannel.conf near to sms service 'Default' part, with sms service 'Default' part in this package contrib/kannel/kannel-geturl.conf  
After copying sample configuration, dont forget to change 'CHANGE\_THIS\_TO\_YOUR\_PLAYSMS\_URL'  
in your kannel.conf near to sms service 'Default' part, to your working PlaySMS URL

Catatan:

Di FC4, secara default direktori home user ngga bisa diakses dari web. Untuk membuatnya aktif, kita edit file /etc/httpd/conf/httpd.conf. Cari baris berikut dan beri tanda comment di depan UserDir disable:

```
UserDir: The name of the directory that is appended onto a user's home
UserDir is disabled by default since it can confirm the presence
UserDir disable
```

Ok, sekarang kita restart apache, dan kemudian kita coba buka web playsmsnya. Kalau ada di localhost, kita ketik ini di browser:

<http://localhost/~playsms>

Loginlah dengan username: admin, password: admin

```
Hello admin...

Personal:
• Phonebook
• Public phonebook
• Message's template
• Send text SMS
• Send Unicast SMS
• Inbox
• Outbox
• Preferences

Features:
• Manage SMS autospeller
• Manage SMS boards
• Manage SMS commands
• Manage SMS custom
• Manage SMS polls

Gateway Module:
• Manage cksmsf
• Manage gnokii
• Manage kannel
• Manage uplink

Administration:
• Manage user
• Main configuration
• Daemon manual refresh

Help:
• FAQ
• README
• INSTALL
• CHANGELOG
• Logout
```

### D. Mentesting

Setelah semua siap, marilah kita testing.

- Jalankan bearerbox

bearerbox /etc/kannel.conf

```
2006-02-16 09:11:48 [6196] [0] INFO: Kannel bearerbox II version 1.4.0 starting
2006-02-16 09:11:48 [6196] [0] INFO: Loading store file `/var/log/kannel/kannel.store'
2006-02-16 09:11:48 [6196] [0] INFO: Store-file size 0, starting to unpack
2006-02-16 09:11:48 [6196] [0] INFO: Retrieved 0 messages, non-acknowledged messages: 0
2006-02-16 09:11:48 [6196] [7] DEBUG: Thread 7 (gw/smsc/smsc_at.c:at2_device_thread)
maps to pid 6196.
2006-02-16 09:11:48 [6196] [0] INFO: MAIN: Start-up done, entering mainloop
```

## Membuat SMS Gateway dgn Modem GSM Iteqno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

---

```
2006-02-16 09:11:48 [6196] [0] DEBUG: AT2[linuxku]: start called
2006-02-16 09:11:48 [6196] [8] DEBUG: Thread 8 (gw/bb_smsconn.c:sms_router) maps to pid
6196.
2006-02-16 09:11:48 [6196] [8] DEBUG: sms_router: time to sleep
2006-02-16 09:11:48 [6196] [8] DEBUG: sms_router: list_len = 0
2006-02-16 09:11:48 [6196] [7] DEBUG: AT2[linuxku]: detecting modem type
2006-02-16 09:11:48 [6196] [7] INFO: AT2[linuxku]: opening device
2006-02-16 09:11:48 [6196] [7] DEBUG: AT2[linuxku]: device opened
2006-02-16 09:11:49 [6196] [7] DEBUG: AT2[linuxku]: device opened
2006-02-16 09:11:49 [6196] [7] INFO: AT2[linuxku]: speed set to 115200
2006-02-16 09:11:49 [6196] [7] DEBUG: AT2[linuxku]: --> ^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: --> AT^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- AT
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: --> AT&F^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- AT&F
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: --> ATE0^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- ATE0
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: --> ATI^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- WAVECOM MODEM
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- MULTIBAND 900E 1800
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: found string <WAVECOM>, using
modem definition <wavecom>
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CSMS=?^M
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- +CSMS: (0,1)
2006-02-16 09:11:51 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:51 [6196] [7] INFO: AT2[linuxku]: Phase 2+ is supported
2006-02-16 09:11:51 [6196] [7] INFO: AT2[linuxku]: closing device
2006-02-16 09:11:52 [6196] [7] INFO: AT2[linuxku]: opening device
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: device opened
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: device opened
2006-02-16 09:11:52 [6196] [7] INFO: AT2[linuxku]: init device
2006-02-16 09:11:52 [6196] [7] INFO: AT2[linuxku]: speed set to 115200
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> ATZ^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> AT^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- AT
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> AT&F^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- AT&F
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> ATE0^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- ATE0
```

## Membuat SMS Gateway dgn Modem GSM Itegno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

---

```
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> AT+IFC=2,2^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CPIN?^M
2006-02-16 09:11:52 [6196] [7] DEBUG: AT2[linuxku]: <-- +CPIN: READY
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CSCA="0816124"^M
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CMGF=0^M
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CSMS=?^M
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- +CSMS: (0,1)
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:12:03 [6196] [7] INFO: AT2[linuxku]: Phase 2+ is supported
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CSMS=1^M
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- +CSMS: 1,1,1
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: --> AT+CNMI=1,2,0,1,0;+CMEE=1^M
2006-02-16 09:12:03 [6196] [7] DEBUG: AT2[linuxku]: <-- OK
2006-02-16 09:12:03 [6196] [7] INFO: AT2[linuxku]: AT SMSC successfully opened.
```

- Jalankan smsbox:

```
smsbox /etc/kannel.conf
```

```
2006-02-12 13:36:20 [7002] [0] DEBUG: Kannel smsbox version 1.4.0 starting
2006-02-12 13:36:20 [7002] [0] DEBUG: Started thread 4 (gw/smsbox.c:obey_request_thread)
2006-02-12 13:36:20 [7002] [0] DEBUG: Started thread 5 (gw/smsbox.c:url_result_thread)
2006-02-12 13:36:20 [7002] [0] DEBUG: Started thread 6 (gw/smsbox.c:http_queue_thread)
2006-02-12 13:36:20 [7002] [0] INFO: Connected to bearerbox at localhost port 13001.
2006-02-12 13:36:20 [7002] [0] DEBUG: Started thread 7 (gw/heartbeat.c:heartbeat_thread)
2006-02-12 13:36:20 [7002] [2] DEBUG: Thread 2 (gwlib/http.c:server_thread) maps to pid
7002.
2006-02-12 13:36:20 [7002] [3] DEBUG: Thread 3 (gw/smsbox.c:sendsms_thread) maps to pid
7002.
2006-02-12 13:36:20 [7002] [1] DEBUG: Thread 1 (gwlib/fdset.c:poller) maps to pid 7002.
2006-02-12 13:36:20 [7002] [4] DEBUG: Thread 4 (gw/smsbox.c:obey_request_thread) maps to
pid 7002.
2006-02-12 13:36:20 [7002] [5] DEBUG: Thread 5 (gw/smsbox.c:url_result_thread) maps to pid
7002.
2006-02-12 13:36:20 [7002] [6] DEBUG: Thread 6 (gw/smsbox.c:http_queue_thread) maps to
pid 7002.
2006-02-12 13:36:20 [7002] [7] DEBUG: Thread 7 (gw/heartbeat.c:heartbeat_thread) maps to
pid 7002.
```

- Buka playsms dan coba kirim sms ke temen kita:



# Membuat SMS Gateway dgn Modem GSM Iteqno, Kannel, & Playsms

Written by ari

Saturday, 18 February 2006 02:56 - Last Updated Monday, 20 February 2006 04:40

Send text SMS

From: +62911302701

To: +62911302701

Message body: [Empty]

Send Message

Cancel

Close

Administration:

- Send on mobile message (http://www.itsrc.com)

... dan sebagai tambahan juga saya akan menambahkan modul ke dalam sistem yang sudah ada...

Delivery report

| ID | Time                | Message                       | Status    | Detail |
|----|---------------------|-------------------------------|-----------|--------|
| 1  | 2006-02-17 11:01:04 | Test text SMS Message - Super | Delivered | 131.14 |

... dan sebagai tambahan juga saya akan menambahkan modul ke dalam sistem yang sudah ada...

... dan sebagai tambahan juga saya akan menambahkan modul ke dalam sistem yang sudah ada...