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Tuesday, December 16, 2003

Linksys Wireless Media Appliance [updated]

[update]

As Sean Lincolne pointed out, squishguava, the boot image this thing loads over the network when it boots, is just a simple cramfs image. The "COMPRESSED ROMFS" in my earlier 'strings' is a dead give-away on this. I finally got some time to have a peek at it. It has the following in it:

```
libc-2.1.3.so*libm-2.1.3.so*librms.so*rio*libdl-2.1.3.so*libmp3msp.so*libthreadutil.so*scripts/libhttpmsp.so*libmrdi.so*libw  
mamsp.so*version.txtlibiupnp.so*liboalmsp.so*mrd*web/libixml.so*libpil.so*mrdDevice*liblmsp.so*libpthread-0.8.so*pile  
g.dat*
```

It is obviously not a full Linux filesystem, as can be seen by looking at files in the scripts directory, this filesystem gets mounted on /guava. I compiled a small statically linked busybox and stuck it in bb/ which among other things had bb/sbin/telnetd in it. Then I hacked up scripts/rio-script and had it launch the telnetd right before it launches the rio. Built a new cramfs squishguava image and booted with it. It actually booted just fine. I was worried they might have some sort of checksum check, or my added 600k would overflow something, but it was fine. The bad news is that I couldn't get in via telnet. So, either, my telnetd didn't start properly, or the port is blocked.

I did notice that the default shell is /bin/ash which also happens to be the default shell in BusyBox and Linksys has used Busybox on other devices in the past. I bet the rom firmware which has the root filesystem for this thing is just a busybox image. So a bit more hacking on that rio-script should let me either somehow get a message out to me by trying various standard busybox commands, or I can run some stuff to try to deblock the port. Any suggestions on what is likely to work right away?

More info. I replaced the rio binary with my arm cross-compiled telnetd binary and it then doesn't get beyond the "Launching remote-IO" message during boot. At least it tells me that what I am doing has some effect. But I still can't get in via telnet. I also tried replacing it with a script that tried to ping out, cat stuff to /dev/dsp and echo stuff to various devices and none of that did anything I could see/hear.

[/update]

This looks like a nifty little box that will make it easy to access mp3's and photos directly from a remote-control TV-displayed interface. Much nicer than needing to stick a PC next to the TV/Stereo in the living room.

This little device showed up today. Had no trouble configuring it and hooking it up once I shuffled the various cables around a bit on the back of the TV and stereo. The music navigator is really nice on it and I like that you can play mp3's while a photo album is cycling through. Will have to try this thing against some Samba shares later on.

No luck on the Samba shares, or any sort of shares at all actually. I did a bit of sniffing of the datastream between the WMA and XP. When it starts up the first thing it does after getting an IP via DHCP is to grab its OS image from the XP box. That image is clearly a Linux 2.4.17 kernel and all communications appear to be via a UPnP A/V Media Renderer SOAP thing. As far as I can tell, when you designate a directory via the Media tool on the XP box, it creates a regular .m3u playlist out of that and serves it up to the WMA when requested. There doesn't appear to be any encryption involved, so getting this thing to work with a Linux box as the server would involve creating a UPnP SOAP server that understood the requests from the WMA. Not that this is a trivial effort, but certainly not impossible and once done this thing would be able to serve files up from anywhere a Linux box could access files from. Frankly I don't see why the heck the SOAP server they provide for XP can't serve up its playlists from a network share. There doesn't appear to be any technical reason for this restriction. I bet that with a bit of hacking and with the help of libupnp this is quite feasible.

Or, alternatively, create a custom image from the sources Linksys is supposed to provide. They have their GPL Page but it doesn't list the WMA11B (yet?). As George notes, SOAP isn't exactly ideal for something as simple as moving mp3s and image files around. An alternate image that was able to mount shares directly, would be cool. It might require sticking a .m3u playlist file in each directory so you wouldn't need to do that on the WMA, but that wouldn't bug me either.

For more info on the technology in this device, have a read through Intel's Digital Home Site or see the extended entry for some nitty-gritty protocol details.

Don't ask me why the boot image is called squishguava, but it is. Can't gleam too much out of it other than the fact that it is very likely to be a Linux image.

% strings squishguava
Compressed ROMFS
6i8V
Compressed
version.txt
libhttpmso.so
libiupnp.so
libixml.so
libllmso.so
libmp3mso.so
libmrdi.so
liboalmso.so
libpil.so
librms.so
libthreadutil.so
libwmamso.so
mrdDevice
pilreg.dat
libc-2.1.3.so
libdl-2.1.3.so
libm-2.1.3.so
libpthread-0.8.so
scripts
channelmgrscpd.xml
remoteinputscpd.xml
riodevicedesc.xml
rioscpd.xml
ConnectionManager.xml
MediaRendererDevDesc.xml
RendererControl.xml
TCxml.xml
Transport.xml
rio-script
mrd-script

The data stream when you fire this thing up is much more telling. Near the start we see a, "Hey I am Awake" message. 172.16.10.100 is the WinXP box and 172.16.10.105 is the WMA.

```
NOTIFY /AdapterInfoService/event HTTP/1.1
HOST: 172.16.10.100:8037
Content-Type: text/xml
NT: upnp:event
NTS: upnp:propchange
SID: uuid:1
SEQ: 0
Content-Length: 324
<firmware>
  <version>Ver. 11 R06</version>
  <time>09:50:28 AM</time>
  <date>08/01/03</date>
</firmware>
```

It also sends a NOT_STARTED message:

```
NOTIFY /ApplicationTransferService/event HTTP/1.1
HOST: 172.16.10.100:8037
Content-Type: text/xml
NT: upnp:event
NTS: upnp:propchange
SID: uuid:2
SEQ: 0
```

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Content-Length: 177

NOT_STARTED

And the response back from the WinXP box is:

```
POST /AdapterInfoService/control HTTP/1.1
HOST: 172.16.10.105:62063
SOAPACTION: "urn:schemas-upnp-org:service:AdapterInfoService:1#GetExtDeviceDescription"
CONTENT-TYPE: text/xml ; charset="utf-8"
Content-Length: 303
```

Posted by Rasmus in WIFI Toys at 23:25

XS-Drive

This XS-Drive toy looks useful. I noticed Compgeeks has them for \$89.99 without a drive. Then it is just a matter of picking up any 9.5mm laptop drive and slapping it in there. DPReview of it

On the other hand, it does seem a bit silly walking around with two harddrives all the time. One for your mp3 player and one for offloading your digital cameras. So they have a combined version called the XS Drive Pro. I wonder how well this one works. Very little info out there on this thing and it looks like it is only selling in the UK right now. If anybody has one, please report back.

Posted by Rasmus at 21:15