82 Replies Latest reply: Mar 27, 2015 3:43 PM by AlexT_Intel **1** 2

AlexT_Intel Sep 19, 2014 4:48 AM

How to enable the Yocto-provided package management capability

UPDATE 19-Sep-2014: The post is now two-part, first one describes how to create your own repo, second one has information about the existing repo

Part 1: Creating your own repo
As some of you may know, the Linux image you create after following the BSP Build Guide is not the only result of the process.
It also builds a lot of additional software packages, only some of which are making it into the image. You can install those additional ones using Yocto's package managemer
(which is being added by default) and the respective tool called opkg.

The idea is pretty much the same as with those customary package managers you may be using today, like yum, zypper, apt-get and so on. You need to have a package man
repository of packages and a way to access it over the network using e.g. HTTP protocol.

The repository is created by Yocto during BSP build, the package manager is in your Linux image by default and here's the instruction on how to enable the HTTP sharing of
what settings you need on the Galileo.

This is for Apache, you'll need to adjust accordingly for your favorite HTTP server. I also assume you have network connectivity on your board and can access the console eit
port or SSH. For instructions on enabling those please see other threads - search is your friend, we have excellent guides in this community already.

1) Create a VirtualHost for your package web site, use the below config excerpt as a template. There may be a lot of details, depending on your distro and preferences, but th
you an idea (if it doesn't - please ask).

```
NameVirtualHost *:80

<Directory "/srv/www/htdocs">
  Options FollowSymLinks
  AllowOverride None
</Directory>

<VirtualHost *:80>
    DocumentRoot "/srv/www/htdocs/pkgrepo.my.local"
    ServerName pkgrepo.my.local
    UseCanonicalName off
    <Directory "/srv/www/htdocs/pkgrepo.my.local">
        Options +Indexes
        AllowOverride none
        Order allow,deny
        Allow from all
    </Directory>
</VirtualHost>
```

Here /srv/www/htdocs/pkgrepo.my.local is a symlink to the directory where Yocto puts the packages and package indexes. On my machine the full path to it is: /home/dev/y
clanton_v0.8.0/yocto_build/tmp/deploy/ipk/
That is, I've unpacked the BSP into /home/dev/yocto/meta-clanton_v0.8.0 and yocto_build is the build directory created by default.

Make sure Apache user, typically www, has read access to that ipk directory. Generally you can just run

```
chmod -R o+rx /home/dev/yocto/meta-clanton_v0.8.0
```

to get that.

2) Reload Apache to have it pick up the config (/etc/init.d/apache2 reload, or whatever your distro's equivalent is)

3) In the output of the below command you should see the newly created VirtualHost and you should be able to access it using the browser and see the listing of the directo
that ipk one. Here I have only one VirtualHost:

```
lnx:~ # apache2ctl -S
VirtualHost configuration:
wildcard NameVirtualHosts and _default_ servers:
*:80 is a NameVirtualHost
default server pkgrepo.my.local (/etc/apache2/vhosts.d/pkgrepo.my.local.conf:11)
port 80 namevhost pkgrepo.my.local (/etc/apache2/vhosts.d/pkgrepo.my.local.conf:11)
Syntax OK
```

3) On Galileo (and you should be running off of the SD card, not from the SPI "read-only" image) add the address and the name of the package repo server into /etc/hosts, sc
use a name instead of the plain IP address (the line in **bold** is what you need to add):

```
root@clanton:~# cat /etc/hosts
127.0.0.1       localhost.localdomain localhost
192.168.10.100  pkgrepo.my.local     pkgrepo
```

4) Add the repository information into /etc/opkg/base-feeds.conf. By default you get three directories under ipk, each needs a separate line:

```
root@clanton:~# cat /etc/opkg/base-feeds.conf
src/gz all    http://pkgrepo.my.local/all
src/gz clanton http://pkgrepo.my.local/clanton
src/gz i586   http://pkgrepo.my.local/i586
```

5) Refresh the package index on the Galileo and you're good to go. Here's the expected output:

```
root@clanton:~# opkg update
Downloading http://pkgrepo.my.local/all/Packages.gz .
Inflating http://pkgrepo.my.local/all/Packages.gz .
Updated list of available packages in /var/lib/opkg/all.
Downloading http://pkgrepo.my.local/clanton/Packages.gz .
Inflating http://pkgrepo.my.local/clanton/Packages.gz .
Updated list of available packages in /var/lib/opkg/clanton.
Downloading http://pkgrepo.my.local/i586/Packages.gz .
Inflating http://pkgrepo.my.local/i586/Packages.gz .
Updated list of available packages in /var/lib/opkg/i586.
```

On the basic level opkg is pretty similar to apt-get, you can search, list installed and remote repo packages, etc. Here's a nice guide to opkg: http://wiki.openwrt.org/doc/tech

The above is based on the Yocto's manual, you can find some additional details here: http://www.yoctoproject.org/docs/latest/mega-manual/mega-manual.html#using-runt management

Part 2: Existing repo
If you don't want to create your own one and just need a couple of packages, there's a repo I've created and which Daveman is generously hosting. See the opkg config de page: Package Repo Configuration Instructions . The page will be kept up to date with any repo relocations or changes.

If you have any questions to the above - feel free to ask in this thread and your feedback is more than welcome.

21933 Views Categories: BSP & Yocto Linux, General Topics, Installation, Drivers, & Setup, Software and Libraries Tags: how_to_guide, how_to, galileo, package_management, op

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2

AlexanderMerz Jan 26, 2014 9:26 PM (in response to AlexT_Intel)

1. Re: How to enable the Yocto-provided package management capability

I really love to see this explanation here! Thank you!
This should be go straight to official docs.

I really ask myself why Intel does not setup a regular package server? This would make your live much easier. Especially for all the guys out there like me, who don't have a d machine for the BSP stuff but. I'm on a Mac running Linux in a VM for building the BSP. Booting the VM and do all the network magic to make the VM to act as a webserver ju a package is not always an option.

Actions

Jack

2

zJack Jan 26, 2014 10:55 PM (in response to AlexT_Intel)

2. Re: How to enable the Yocto-provided package management capability

Great info. Now just need to find a server that everyone can use

Actions

1

Thomas_Faust_(Intel) Jan 29, 2014 11:45 AM (in response to AlexT_Intel)

3. Re: How to enable the Yocto-provided package management capability

I wrote this text some hours ago and put it in the queue for the admin to review my post and publish it. It never happened and now I can post without admin review again ... a happened to my post? Do I need to write it all over again? (Or should I ask the NSA for an backup of that missing post?)

Hi AlexT.
Thanks a lot for getting this tutorial together. Before I was copying my ipk pacakges to the target manually – with your approach, at least the dependencies are solved. Don't I think the Yocto system is cool and works to create an embedded image. But here we are makers and want to have a little bit more freedom in our choice.

The functionality of opkg and apt-get (APS) is the same – no doubt. The difference between Yocto/opkg/ipk and a full mature Linux distro (like debian – or name any other) i availability of ready-to-use packages.
Here is my real world example:
A while ago I build a CCTV with an raspberry - http://www.raspberrypi.org/archives/tag/motion-detector
How to make a DIY home alarm system with a raspberry pi and a webcam - https://medium.com/p/2d5a2d61da3d

I tried to do that with the Galileo board as well, so I needed 'motion' - http://motion.sourceforge.net/
So, I compile this on the full Yocto image with devtools, but failed because of some dependencies.

If the debian would work, it would just be an 'apt-get install motion' – done.

To get an ipk package for opkg on the Yocto build, I need to:

1. create an bb (bitbake recipe) for motion
2. figure out what dependencies are needed
3. create bb recipes for the dependencies as well
4. run the full-image bitbake again (took me about 4 hours the last time)
5. on Galileo: opkg install motion

Please correct me if I'm wrong on the steps.

Actions

mdelgert Jan 29, 2014 10:25 PM (in response to Thomas_Faust_(Intel))

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4. Re: How to enable the Yocto-provided package management capability

Hi guys I agree with Thomas_Faust_(Intel).

Over the last several weeks I been trying to get Yocto to add one simple packages like mono to work!

In Debian & Ubuntu it was **"$sudo apt-get install mono"** one line that was it completely done.

I've gone through **hundreds of hours** trying to get Yocto to package "meta-mono" on my Galileo with no success.

C# is a popular language it should be reasonable that someone else would want to install these libraries from http://git.yoctoproject.org/cgit/cgit.cgi/meta-mono

Has anyone found a active Yocto support forum or active community that could help?

The article above "How to enable the Yocto-provided package management capability" does Thomas and I no good for the reason "meta-mono" recipe errors out in the bitb
and Thomas is trying to add one simple library from the linux command prompt. Why can't we have vanilla linux **"with apt-get or public popular package manager"** on the
boards as a simple download from Intel?

I'm currently able to get Debian to run on my Galileo and would like to share my image on Dropbox for the other developers that need "apt-get".

May Intel please provide the instructions how to install all the Galileo board dependencies on a vanilla linux distribution like"Debian, Ubuntu and or FreeBSD"?

When I install Debian on SD card I lose "Sketch", "GPIO" and "CLLOADER". Basically end up with a Galileo board running linux with no Arduino support.

I see in the latest version http://downloadmirror.intel.com/23197/eng/Board_Support_Package_Sources_for_Intel_Quark_v0.9.0.7z image-full.bb the following depender
to build one virtual add all dependencies if successful will post and share this SD image with other developers that need full vanilla linux. So that other developers that don't
time investment and learning curve for Yocto & Bitbake build process. I would be a fan of Yocto if I could just get some simple libraries "meta-mono", "mono-xsp", "monotoo
"mod-mono" up and running with out Bitbake errors during the build.

MAGE_INSTALL += "ethtool pciutils"
IMAGE_INSTALL += "strace"
IMAGE_INSTALL += "linuxptp"
IMAGE_INSTALL += "libstdc++"
IMAGE_INSTALL += "dmidecode"
IMAGE_INSTALL += "opencv nodejs"
IMAGE_INSTALL += "python python-modules python-numpy python-opencv"
IMAGE_INSTALL += "alsa-lib alsa-utils alsa-tools"
IMAGE_INSTALL += "connman wireless-tools wpa-supplicant bluez4"
IMAGE_INSTALL += "ppp openssh"

This Galileo board has allot of promise and is way more appealing to developers than the ARM based processors that is losing linux support. Intel gets much more market sh
respect with this board all us developers need now is vanilla linux with public package manager like apt-get so we can write applications in other languages like C# etc.

Actions

AlexT_Intel Jan 31, 2014 3:28 PM (in response to Thomas_Faust_(Intel))

6

5. Re: How to enable the Yocto-provided package management capability

Hi Thomas,

Yes, the process you describe would be more or less the way to get the package not included into any of the existing Yocto or OpenEmbedded layers (and there are *a lot* of

And no, I not saying that's the best or the only way to do things :-) I was just interested in getting this Yocto-provided capability working and published the results of my expl

I definitely agree the well-established distros have a very big advantage of having an elaborated package ecosystem when a lot of packages are available right away in public
repos. That's why I appreciate the work you and others do in those Debian-related threads and I have mentioned that there.

I believe there's a place for both approaches. For instance I personally don't need a full-blown distro on Galileo, because I don't need an arbitrary package on it at arbitrary m
typical distro will most probably be slower than trimmed-down Yocto-generated one and have tons of unnecessary bloat wasting the SD card space I don't need on a board
just several pretty much specified functions in my projects and I will prepare packages or plain compiled binaries for those using Yocto or cross-compilation toolchain or a t
installed SDK image in advance. I prefer to have an optimized system able to run required functions at maximum possible performance level with only those functions availa

security and again performance), that's where Yocto with its capability of generating a tailored Linux distro comes in handy.

On the other hand, you and other people working in that thread, as well as many other people, I'm pretty sure, would want to have a generic Linux playground or avoid all th compilation steps and be able to install whatever at whatever moment, or have some other reasons I just can't think right now - and that's IMHO absolutely ok, that's the Mal Source spirit. My personal guess is that with time, as community grows and Quark-based product become more commonplace, we'll see distros catching up on that and rolli versions tailored for it, which wouldn't require any major work on our side. Especially given the fact that's x86 after all and Linux is used from the very beginning as the OS - s they'll upstream all the specific tweaks to the vanilla kernel.

Actions


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Thomas_Faust_(Intel) Feb 1, 2014 1:30 PM (in response to AlexT_Intel)

6. Re: How to enable the Yocto-provided package management capability

Hi AlexT. (BTW: Shoot me an Intel email, would like to share some thoughts)

You are absolutely right. The debian approach is not for the performance. Compared to the Yocto build, it's very slow.

The beauty about the Quark/Galileo ecosystem is that the Irish team managed to make all information public. From board schematics, to architecture specification, even the code and the JTAG debug interface (afaik first time ever for an IA processor). That means that we are not limited to the approach that is given to the community in first place great environment and most likely fits to the most for an embedded system where Quark wants to play. But everyone can build on its own SW stack. Maybe I should try MINI FreeRTOS, just for the fun of it.
What I want to say is that I'm happy that we have these options on Galileo and I'm really looking forward to see what the community is bringing up. May there be no limits!

I got a little off-topic. Sorry. Please keep posting the Yocto recipes. It fuels all the ideas out there to build a great IA/Quark/Galileo ecosystem.

Actions


6

AlexT_Intel Feb 1, 2014 1:55 PM (in response to Thomas_Faust_(Intel))

7. Re: How to enable the Yocto-provided package management capability

Thomas, you know what - the things you've just mentioned are exactly my opinion/view too! :-) I had them in mind writing the above reply, but didn't want to make it any lon already was.

> Shoot me an Intel email, would like to share some thoughts
Will do.

Actions


6

AlexT_Intel Feb 2, 2014 1:29 PM (in response to AlexT_Intel)

8. Re: How to enable the Yocto-provided package management capability

Okay, here goes the publicly accessible repo :-) This is an initial attempt, we'll see how it works out, because it's not ideal from my point of view, but it required minimal effor far.

I have used bintray.com to create a repository with all the packages, which "bitbake image-full" compiles (+newer node.js, redis and not included by default ntp packages). I'v work fine with my board and *your* feedback is welcome.

The file management features at Bintray are somewhat limited and they only provide 500MB for free, but at least they offer a plain repo-type web hosting without those surp templates and file management limitations typical web hosters do. If someone knows any better alternative - I'm all attention :-)

To configure your Galileo to fetch packages from there, do the following:
1) Make sure you're working with SD card Linux image and not the SPI one;
2) Replace anything you have in /etc/opkg/base-feeds.conf with the following (other opkg config files don't need any changes):

> **root@clanton:~# cat /etc/opkg/base-feeds.conf**
> src/gz all http://dl.bintray.com/alext-mkrs/galileo-packages/all
> src/gz clanton http://dl.bintray.com/alext-mkrs/galileo-packages/clanton
> src/gz i586 http://dl.bintray.com/alext-mkrs/galileo-packages/i586

3) Run **opkg update** command and you should see the below output, which means you're successfully communicating with the repo:

> **root@clanton:~# opkg update**
> Downloading http://dl.bintray.com/alext-mkrs/galileo-packages/all/Packages.gz .
> Inflating http://dl.bintray.com/alext-mkrs/galileo-packages/all/Packages.gz .
> Updated list of available packages in /var/lib/opkg/all.
> Downloading http://dl.bintray.com/alext-mkrs/galileo-packages/clanton/Packages.gz .
> Inflating http://dl.bintray.com/alext-mkrs/galileo-packages/clanton/Packages.gz .
> Updated list of available packages in /var/lib/opkg/clanton.
> Downloading http://dl.bintray.com/alext-mkrs/galileo-packages/i586/Packages.gz .
> Inflating http://dl.bintray.com/alext-mkrs/galileo-packages/i586/Packages.gz .
> Updated list of available packages in /var/lib/opkg/i586.

If you don't see that or have other problems/questions - feel free to post here, I'll see if I can help.

Just to make sure no one is mislead - this is not any kind of an official or Intel-endorsed repo. While I do work for Intel, I'm not related to Galileo by any means and in this same Maker as anyone else here, doing that in my spare time as a hobby project. I see a rising demand for such a repo and that's what I came up with to help the community it works out.

The packages were compiled with BSP v0.8.0, but theoretically should work with Linux images based on any of the current BSPs (0.7.5, 0.8.0, 0.9.0), but there's definitely no with everything in the Makers world you use that on your own risk :-)

I recommend you to back up your image-full-clanton.ext3 file, which contains the OS filesystem image, before installing any packages, that way you should be able to always known working state if something goes wrong.

Actions


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Thomas_Faust_(Intel) Feb 3, 2014 1:33 AM (in response to AlexT_Intel)

9. Re: How to enable the Yocto-provided package management capability

Thanks a lot AlexT for setting up the repository. I hope the available binary pacakges will increase over time and more and more useful tools will be available to the maker co My first request (as already discussed in the other thread) is 'motion'.

BTW: Nice disclaimer.
Keep the good work up.

Actions

6

AlexT_Intel Feb 3, 2014 10:18 AM (in response to Thomas_Faust_(Intel))

10. Re: How to enable the Yocto-provided package management capability

Thanks :-)

Motion happens to be on my list to after bundled avconv/avserver provided less than desired stability :-) I've almost started yesterday, but eventually didn't have time to loo serious degree. I'll be posting stuff as I come up with something meaningful.

Actions


2

AlexanderMerz Feb 3, 2014 12:42 PM (in response to AlexT_Intel)

11. Re: How to enable the Yocto-provided package management capability

Amazing! Thank you! I will give it a try as fast as possible!

Actions

6

AlexT_Intel Feb 15, 2014 10:48 AM (in response to AlexT_Intel)

12. Re: How to enable the Yocto-provided package management capability

For everyone's information, due to ridiculously deficient file management capabilities at Bintray.com (probably package repository use case is not what they're after), I've dec the repo to another hosting. After some selection process I've picked Altervista as they seem to offer the most features and disk space (2x compared to Bintray) for free.

Please find the Galileo configuration instructions here: Package Repo Configuration Instructions and feel free to let me know in this thread if you have any troubles with th

The old one on Bintray.com will be deleted in about a week.

Actions

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Copernicus Feb 19, 2014 9:30 AM (in response to AlexT_Intel)

13. Re: How to enable the Yocto-provided package management capability

I'd like to install GCC. I've recompiled the 0.9.0 BSP and also connected to the Altervister repo. (Thank you for putting this together - it's great to have!)

Is there a chance you'll add GCC to the repository?

Actions

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rmm200 Feb 19, 2014 10:25 AM (in response to Copernicus)

14. Re: How to enable the Yocto-provided package management capability

Alex's package repository is great - but gcc is so basic, you really should have it in your yocto build.
Sergey has a really good blog on adding tools to your build - take a look at his image-sdk mods.
If you are building your own bsp, image-sdk is no harder.
I did not even make image-sdk, I just modified the image-full recipe.

Sergey's Blog - Malinov Family Web Presence

Actions