

# Embedded Linux with OpenEmbedded

Embedded Computing Conference 2011

David Büchi, bbv Software Services AG



# Ingredients





**Tools**

# Recipe

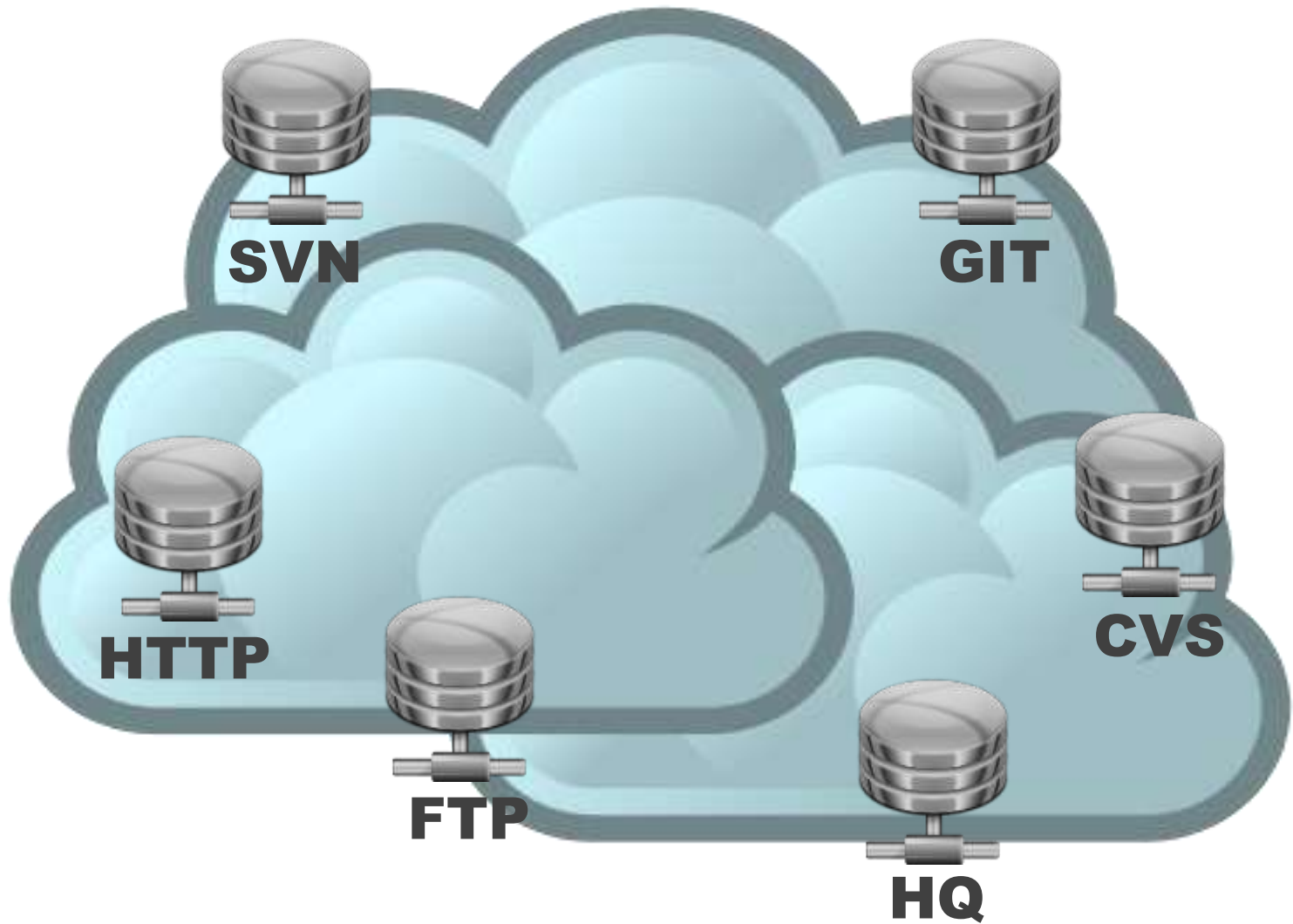


Serves 4

- 1 small green banana
- 2 teaspoons turmeric
- 1 tablespoon oil
- 1 teaspoon mustard seed
- 1 small onion, finely sliced
- 20 curry leaves
- 2 red chillies
- 2 dried chillies
- 1 teaspoon salt
- 10cm ginger, peeled and sliced

# Embedded Linux???

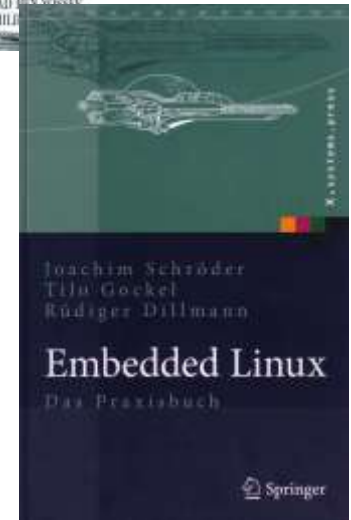
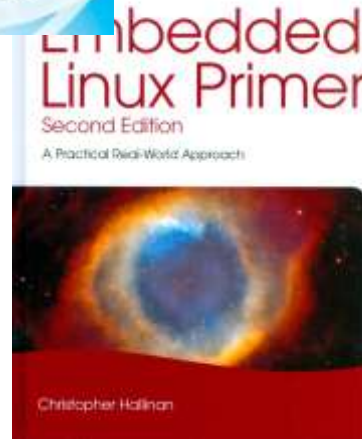
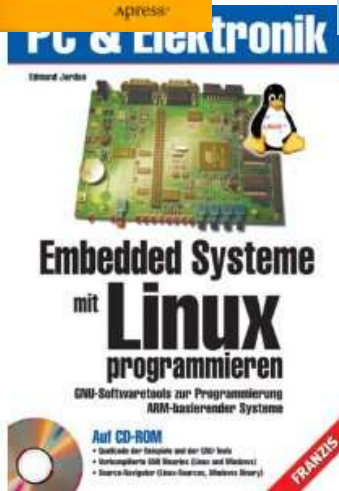
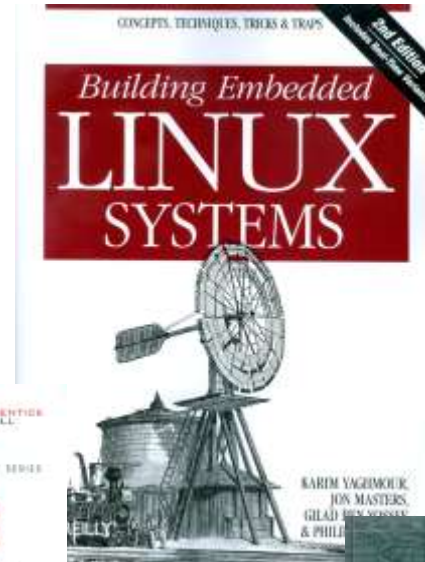
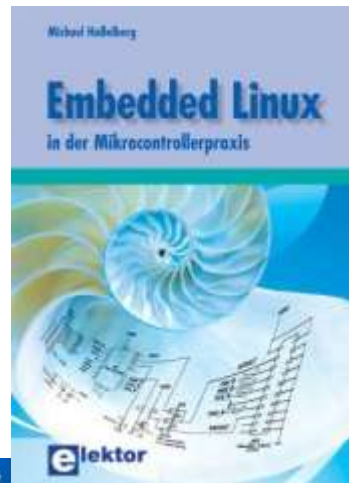
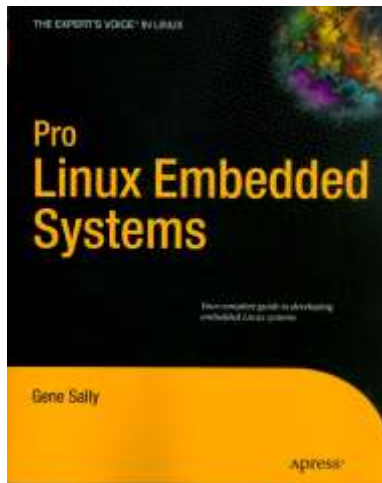
# Incredients



# Tools



# Recipes



# Success Factors

- **Reproducibility**
- **Maintainability**
- **Expandability**
- **Time**
- **Costs**

# The Three Bs (of Embedded Linux)

- **B**uy

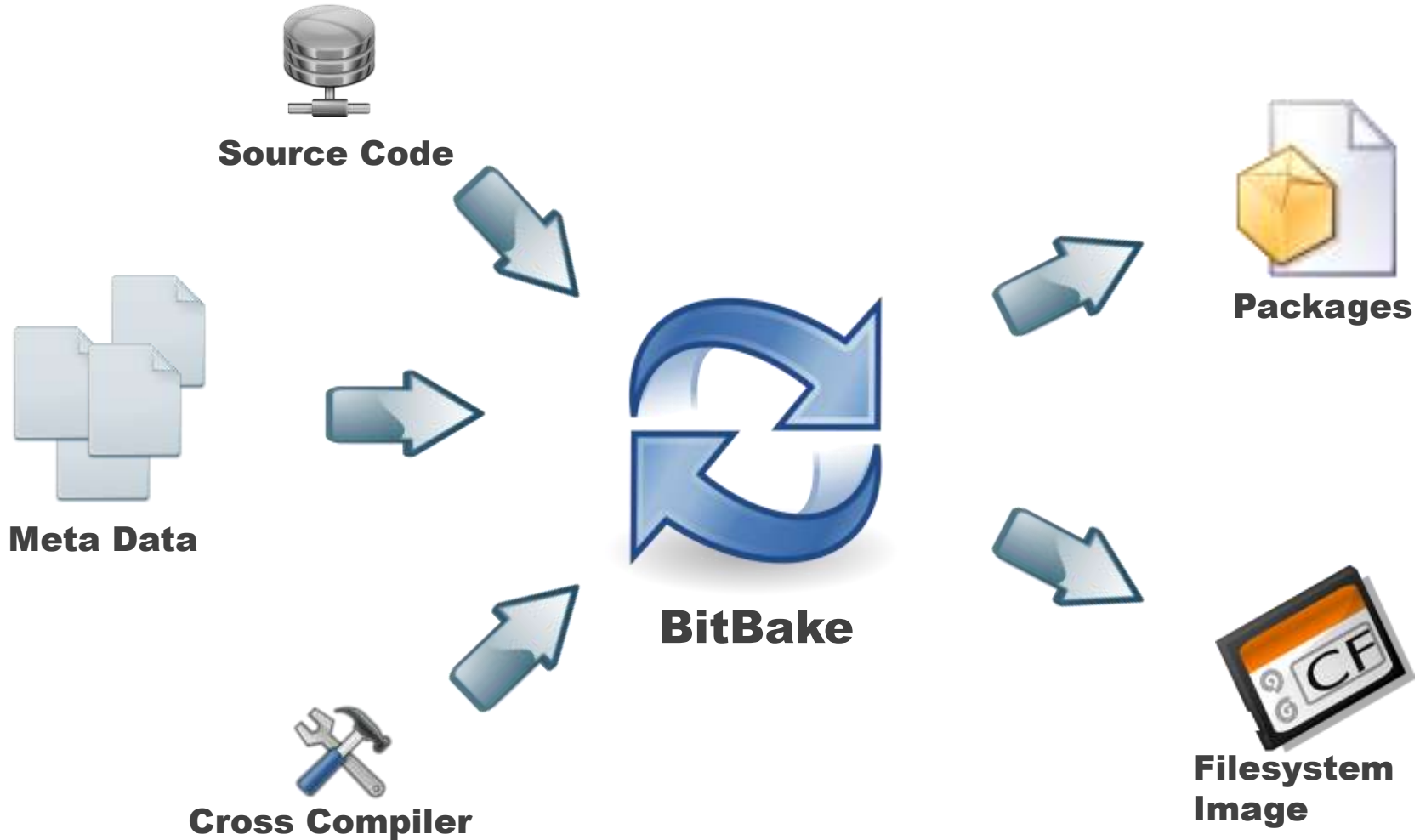
- **B**uild

- **B**orrow

# OpenEmbedded

*“a set of metadata used to cross-compile, package and install software packages”*

# OpenEmbedded Workflow



# OpenEmbedded Metadata



**config  
data**



**classes**



**recipes**



**BitBake**

# Config Data



- **Distro**

toolchain, libc, versions

- **Machine**

architecture, kernel, image type

# Classes



## Common functionality for a set of packages

- **kernel** (build a Linux kernel)
- **module** (build a kernel module)
- **autotools, cmake, qmake**  
(buildsystem specific)

# BitBake Recipes



- **Packages**  
software packages
- **Tasks**  
virtual packages
- **Images**  
definition of Root Filesystems

# BitBake Hello World Recipe

```
DESCRIPTION = "Simple helloworld application"  
SECTION = "examples"
```

```
SRC_URI = "file://helloworld.c"
```

```
S = "${WORKDIR}"
```

```
do_compile() {  
    ${CC} helloworld.c -o helloworld  
}
```

```
do_install() {  
    install -d ${D}${bindir}  
    install -m 0755 helloworld ${D}${bindir}  
}
```

# Autotools Recipe

```
DESCRIPTION = "Simple helloworld application"  
SECTION = "examples"
```

```
SRC_URI = "http://ftp.gnu.org/gnu/hello/hello-2.7.tar.gz"
```

```
S = "${WORKDIR}"
```

```
inherit autotools
```

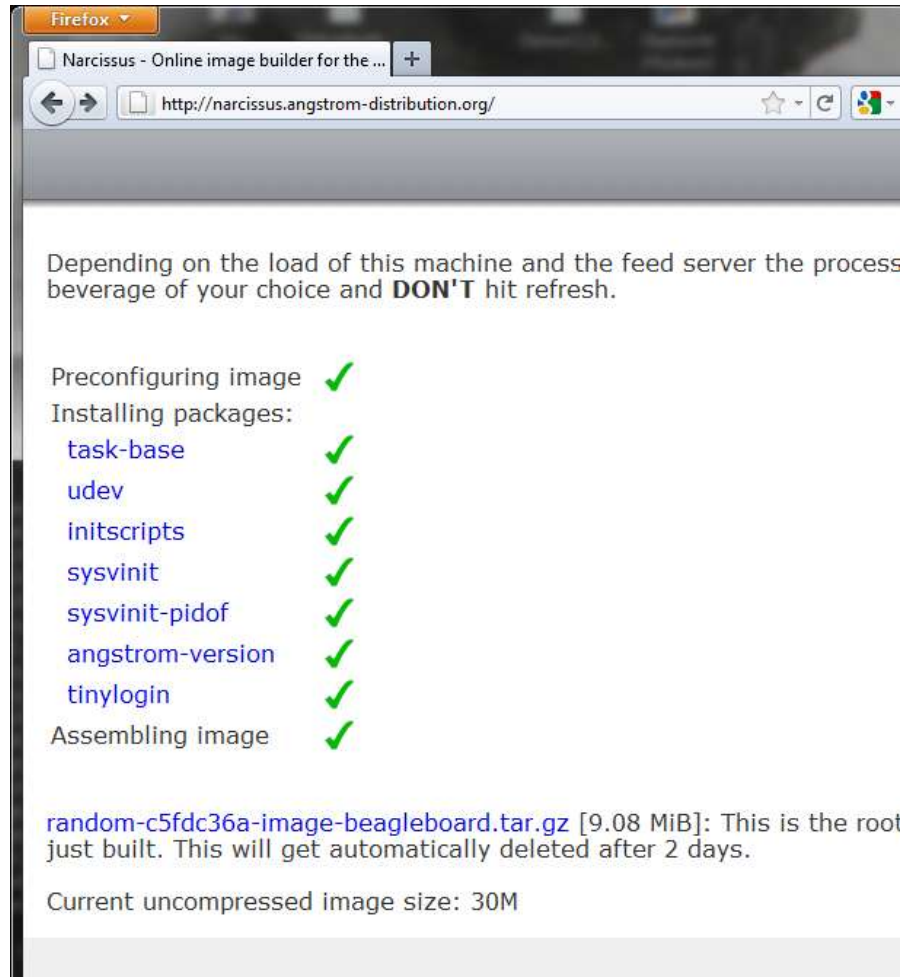
# Open Embedded Packages

# Success Stories

The Ångström Distribution  
Embedded power

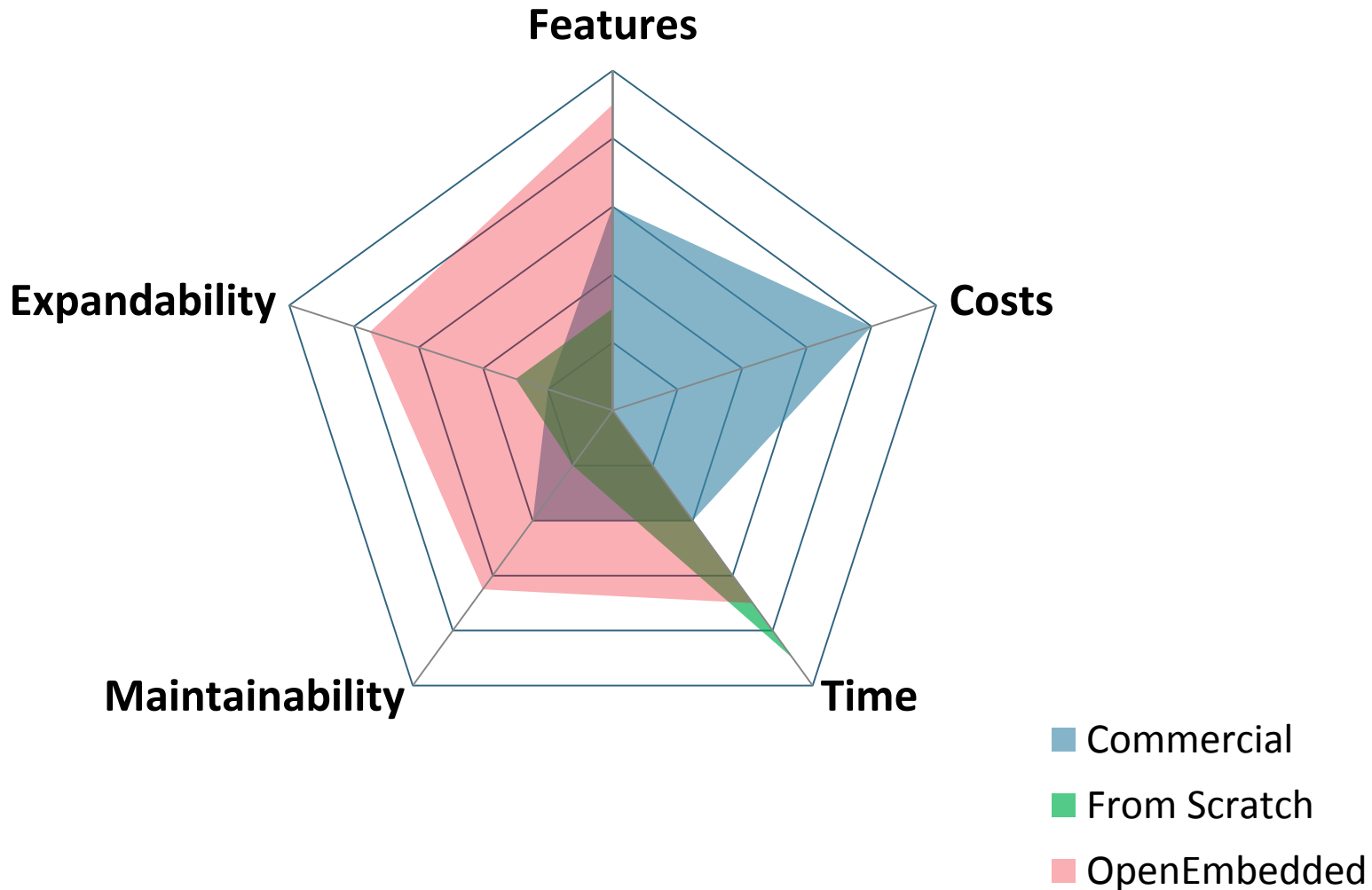


# Online Builder – Ångström Narcissus



<http://narcissus.angstrom-distribution.org/>

# Comparison



# Future

yocto .  
PROJECT

[www.yoctoproject.org](http://www.yoctoproject.org)



**David Büchi**

david.buechi@bbv.ch

www.bbv.ch

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