# theben

# IPsecure Router KNX
## Product manual

LAN (PoE)

theben   KNX
○ ON
○ LAN / LINK
○ Telegram

IPsecure Router KNX

12...30 V DC
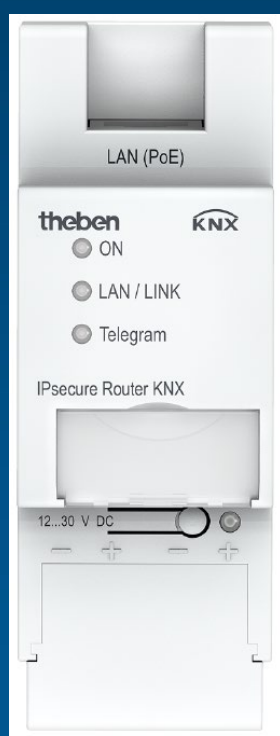
# IPsecure Router KNX
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## Contents

# IPsecure Router KNX
## Contents

# 1 General

The Theben IPsecure Router connects the KNX bus with an Ethernet network. KNX telegrams can be sent to or received from other devices via the network. The device supports the KNX Secure protocol (KNXnet/IP Security).

## 1.1 Using the product manual

This manual provides detailed technical information on the function, installation and programming of the Theben KNX device. The application is explained using examples.

This manual is divided into the following chapters:

Chapter 1        General

Chapter 2        Device technology

Chapter 3        Commissioning

Chapter 4        Planning and application

Chapter A        Appendix

## 1.2 KNXnet/IP Security

The device should always be operated in KNX Secure mode. This ensures security for runtime communication on the IP backbone, for the tunneling servers and for commissioning the device itself.

See also chapter, KNX Secure.

**1.2.1**        **Notes**

Notes and safety instructions are represented as follows in this manual:

| Note |
| --- |
| Tips for usage and operation |

| Examples |
| --- |
| Application examples, installation examples, programming examples |

| Important |
| --- |
| These safety instructions are used as soon as there is danger of a malfunction without risk of damage or injury. |

| Attention |
| --- |
| These safety instructions are used as soon as there is danger of a malfunction without risk of damage or injury. |

| ⚠ Danger |
| --- |
| These safety instructions are used if there is a danger to life and limb with inappropriate use. |

| ⚠ ⚡ Danger |
| --- |
| These safety instructions are used if there is an extreme danger to life with inappropriate use. |

## 1.3 Product and functional overview

The Theben IPsecure Router connects the KNX bus with an Ethernet network. KNX telegrams can be sent to or received from other devices via the network.

The device uses the KNXnet/IP protocol from the KNX Association (routing and tunneling) for communication.
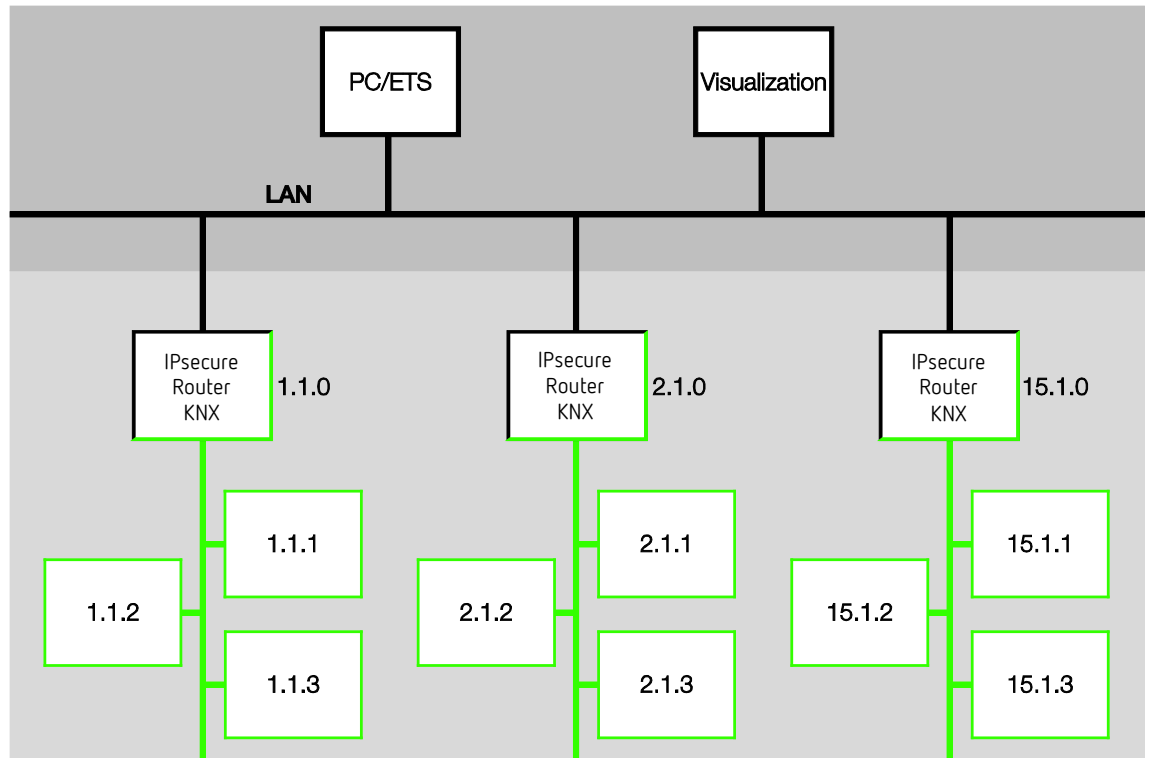


The Router features five tunneling servers, see chapter Use of the integrated tunneling servers. They support both bus monitor and group monitor mode. The tunneling servers can be operated in KNX Secure mode.

In addition to KNX standard multicast communication, up to ten Theben IP Routers KNX can communicate with each other via the unicast protocol, see chapter KNX telegrams in the network. KNX Secure mode is not available in this case. The power supply can be implemented via PoE (Power over Ethernet) according to IEEE 802.3af class 1 or via a supply voltage.

The Theben IP Tool is available for the IPsecure Routers. It allows the Routers to be found in the network (IP discovery), the settings to be made for unicast communication and the firmware to be updated if necessary, see chapter The Theben IP Tool.

An ETS app (KNX Bus Update) is available for the firmware update. If KNX Secure mode is not activated for the devices, a firmware update can also be performed with the IP Tool.

During the update process, the KNX bus (TP) must be connected in addition to the IP network (LAN) so that the KNX parameters can be restored correctly. Otherwise, the update process will fail.

It must be ensured that no voltage failure (KNX or IP) occurs during the update process, otherwise the device can be destroyed.

The device supports the KNX standard function "Monitoring for bus voltage failure". This is a network management function, which is used by visual display systems, for example (see chapter Monitoring for bus voltage failure.

# IPsecure Router KNX
## General

### 1.3.1 Monitoring for bus voltage failure

The IPsecure Router monitors the KNX TP bus for voltage failure. When the status of the bus voltage changes, a broadcast command of the type "NetworkParameterWrite" is sent on the IP network.

The following values are sent:

- Bus voltage failure: "00063301" (hex)

- Bus voltage recovery: "00063300" (hex)

These telegrams can be evaluated, e.g. by a visual display system.

| Type | Info | Meaning |
|---|---|---|
| NetworkParameterWrite | 00 06 33 01 | TP1 bus voltage failure |
| NetworkParameterWrite | 00 06 33 00 | TP1 bus voltage recovery |

### 1.3.2 Overview of versions

| Device | IPsecure Router KNX | |
|---|---|---|
| Application | IPsecure Router KNX | IPsecure Router KNX |
| ETS | ETS 4/5 | ETS 5 |
| | | |
| **Properties of *IP Router*** | | |
| Number of tunneling servers | 5 | 5 |
| Number of unicast connections | 10 | 10 |
| Monitoring for bus voltage failure (see chapter Monitoring for bus voltage failure, | ■ | ■ |
| Filter Group telegrams main group 0…31 | ■ | ■ |
| IP discovery (IP Tool) | ■ | ■ |
| Firmware update (IP Tool) | ■ | ■* |
| Firmware update with KNX Bus Update app | – | ■ |
| Unicast parameterization (IP Tool) | ■ | ■* |
| KNX secure | – | ■ |
| Power over Ethernet | ■ | ■ |
| KNXSecure | – | ■ |

■ = property applies

– = property does not apply

* Only if the device is not operated in KNX Secure mode

## 2      Device technology



IPsecure Router KNX

IPsecure Router is the interface between KNX installations and IP networks. It can be used as a line coupler or area coupler and can utilize the local network (LAN) for exchange of telegrams between lines/areas.

KNX devices can be programmed via LAN using ETS (five tunneling servers are available). The device uses the KNXnet/IP protocol from the KNX Association (routing and tunneling).
Alternatively, the device can communicate via unicast.
The device is powered by 12 to 30 V DC or PoE (Power over Ethernet) to IEEE 802.3af class 1.

## 2.1      Technical data

| | | |
|---|---|---|
| Supply | Auxiliary voltage $U_s$ | 12...30 V DC (+10%/-15%) or PoE (IEEE 802.3af class 1) |
| | Power dissipation | Maximum 1.8 W |
| | Auxiliary voltage, current consumption | Maximum 120 mA at 12 V |
| | Rated voltage $U_n$ | 12 V DC |
| | Current consumption KNX | < 10 mA |
| Connections | KNX | Bus connection terminal |
| | Operating voltage | Plug-in terminal |
| | LAN | RJ45 socket for 10/100BaseT, IEEE 802.3 networks, AutoSensing |
| Operating and display elements | Red LED and button | For assignment of the physical address |
| | Green "On" LED | Operation readiness indicator |
| | Yellow "LAN/Link" LED | Network connection indicator |
| | Yellow "Telegram" LED | KNX telegram traffic indicator |
| Protection degree | IP 20 | To DIN EN 60 529 |
| Protection class | II | To DIN EN 61 140 |
| Isolation category | Overvoltage category | III according to DIN EN 60 664-1 |
| | Pollution degree | 2 according to DIN EN 60 664-1 |
| KNX safety extra low voltage | SELV 30 V DC | |
| Temperature range | Operation | -5...+45 °C |
| | Storage | -25...+55 °C |
| | Transport | -25...+70 °C |
| Ambient conditions | Maximum air humidity | 95 %, no condensation allowed |
| | Atmospheric pressure | Atmosphere up to 2,000 m |

# IPsecure Router KNX
## Device technology

| Design | Modular installation device (MDRC) | Modular installation device, ProM |
|---|---|---|
| | Overall dimensions | 90 x 36 x 64 mm (H x W x D) |
| | Mounting width | 2x 18 mm modules |
| | Mounting depth | 68 mm |
| Installation | On 35 mm mounting rail | To DIN EN 60 715 |
| Mounting position | Any | |
| Weight | 0.1 kg | |
| Housing, color | Plastic, halogen free, gray | |
| Approvals | KNX to EN 50 090-1, -2 | |
| CE mark | In accordance with the EMC directive and low voltage directive | |

| Device type | Application | Maximum number of communication objects | Maximum number of group addresses | Maximum number of assignments |
|---|---|---|---|---|
| IPsecure Router KNX | IPsecure Router/...* | 0 | 0 | 0 |

\* ... = Current version number of the application. **Please refer to the software information on our website for this purpose.**

| Note |
|---|
| ETS 5 and the current version of the device application are required for programming. If the device is to be operated in KNX Secure mode, the commissioning key (FDSK; see chapter, KNX Secure) on the side of the unit will be required as well. |
| The latest version of the application and corresponding software information are available for download from *www.theben.de/en/downloads_en.* After import into ETS, it appears in the *Catalogs* window under *Manufacturers/THEBEN AG/System components/IP Router*. |
| The device does not support the locking function of a KNX device in ETS. If you use a *BCU code* to inhibit access to all the project devices, it has no effect on this device. Data can still be read and programmed. |
| **Exception:** When KNX Secure mode is activated, the device can no longer be programmed with a different ETS. |

# IPsecure Router KNX
## Device technology

**2.2** **Connection diagram**
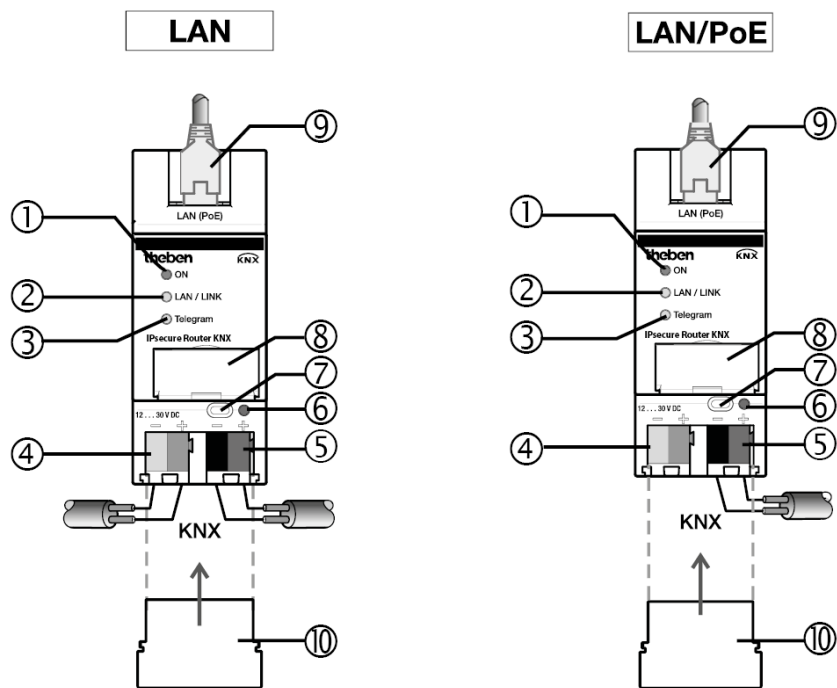


**IPsecure Router KNX**

| | | | |
|---|---|---|---|
| **1** | *ON* LED | **6** | *Programming* LED |
| **2** | *LAN/LINK* LED | **7** | *Programming* button |
| **3** | *Telegram* LED | **8** | Label carrier |
| **4** | Power supply connection | **9** | LAN or LAN/PoE connection |
| **5** | KNX connection | **10** | Cover cap |

# IPsecure Router KNX
## Device technology

2.3       Dimension drawing
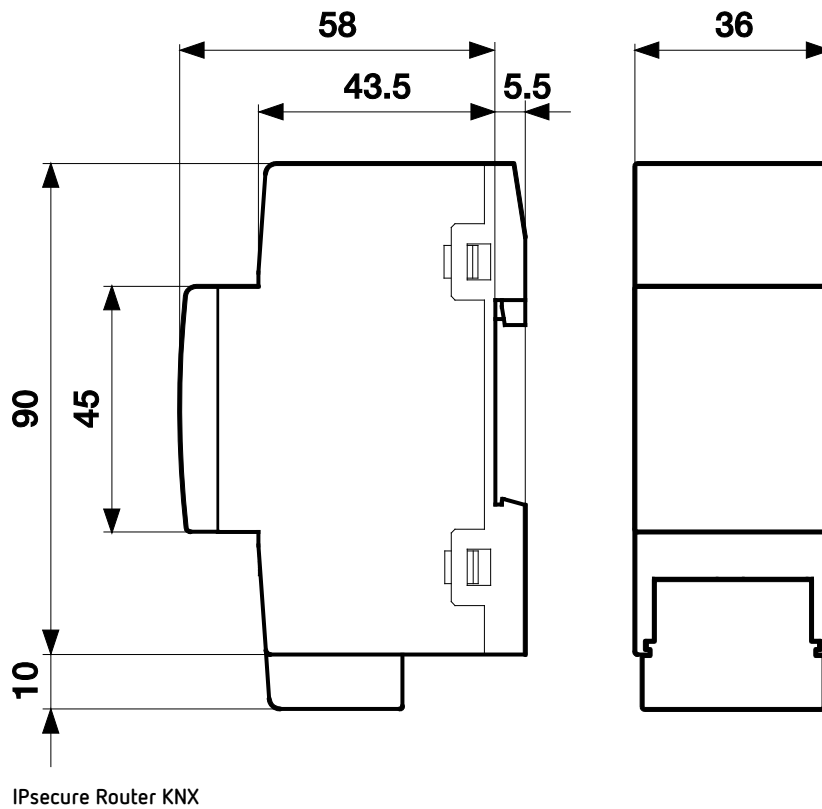
IPsecure Router KNX

## 2.4 Mounting and installation

The device is a modular installation device for quick installation in distribution boards on 35 mm mounting rails to DIN EN 60 715.

The installation position can be selected as required.

The connection to the bus is implemented using the supplied bus connection terminal. The terminal assignment is located on the housing.

The device is ready for operation after connecting the bus voltage and the auxiliary voltage.

Accessibility to the device for the purpose of operation, testing, visual inspection, maintenance and repair must be provided compliant to DIN VDE 0100-520.

### Commissioning requirement

A PC with the latest version of ETS 5 and a supply voltage of 12 to 30 V DC are required in order to commission the device. Alternatively, the device can be powered via PoE (Power over Ethernet) to IEEE 802.3af class 1.

The device is ready for operation after connection to the bus voltage and auxiliary voltage.

Mounting and commissioning may only be carried out by electrical specialists. The appropriate standards, directives, regulations and specifications for the appropriate country should be observed when planning and setting up electrical installations and security systems for intrusion and fire detection.

- Protect the device from damp, dirt and damage during transport, storage and operation.

- Only operate the device within the specified technical data!

- The device should only be operated in an enclosed housing (distribution board)!

- The voltage supply to the device must be switched off before mounting work is performed.

| ⚠️ ⚡ **Danger** |
|---|
| To avoid dangerous touch voltages which originate through feedback from differing phase conductors, all poles must be disconnected when extending or modifying the electrical connections. |

### Supplied state

The device is supplied with the physical address 15.15.0. All physical tunneling connection addresses are set to 15.15.100 in the supplied state. In other words, only one tunnel is visible to the outside. The tunneling connection addresses set in the ETS will be adopted only after the first download.

The IP address is set to automatic IP assignment (DHCP/AutoIP).

| Note |
|---|
| The device is supplied with the option *Route*. This is not the default setting in the application, but it simplifies commissioning. See chapter Parameter window KNX -> LAN. The programmed setting will be adopted after the first download. |

### Assignment of the physical address

The physical addresses and parameters are assigned and programmed in ETS.

The device features a *Programming* button for assignment of the physical address. The red *Programming* LED lights up after the button has been pressed. It goes off as soon as ETS has assigned the physical address or the *Programming* button is pressed again.

**Download reaction**

The device can be programmed in various ways: via one of the integrated tunneling servers ("local download"), via KNXnet/IP routing or via another programming interface (USB or IP).

| Note |
| --- |
| Any USB interface used for programming a KNX Secure device must support "long frames." One suitable USB interface is the USB interface from Theben. |

There must be a connection to the KNX TP (twisted pair) in order to program the device.

After the download is complete, the device reboots and closes all open tunneling connections. If the device's IP address was changed during the download, the tunneling connections must be reconfigured manually in the tunneling clients. Tunneling clients establish the connection to the server via the IP address.

The data programmed with ETS is adopted approx. 30-60 seconds after the download.

**Unloading the device and resetting to factory settings**

The device can be reset to the factory settings. This is a secure device, so the following information must be observed:

When the device is operated in KNX Secure mode, it can be reset via the ETS only if the ETS uses the project with which the device was parameterized or if the commissioning key is available in the project.

The device can be unloaded by right-clicking it in the ETS.

**Option: Unloading the application**

- The IP address and IP configuration will be retained
- Any unicast configuration will be retained
- The passwords and IP addresses of the tunneling servers will be deleted
- The key for multicast communication ("backbone key") will be retained
- The tool key assigned by the ETS will be retained. In other words, the FDSK will not be needed for reprogramming
- The physical address will be retained

**Option: Unloading the physical address and the application**

- The device will be reset to the factory state
- The FDSK will be needed for re-commissioning unless it is still available in the ETS project from the original commissioning process

The reset to factory settings can also be performed directly on the device. This is not a security risk, because the device will no longer be part of the system afterward.

- Press the Programming button when the KNX bus is not connected

- Hold the Programming button down and plug on the bus terminal. The Programming LED flashes (2 Hz)

- Press the button, hold it for at least 5 s and then release it. The Programming LED goes out, and the device reboots with the factory settings

The Router can be reprogrammed if the ETS connects with the device after reset and if the device's FDSK key is still known to the ETS. The ETS will report that the device was reset in this case.

See chapter KNX Secure, for more information about the FDSK (Factory Default Setup Key).

### Cleaning

The voltage supply to the device must be switched off before cleaning. If devices become dirty, they can be cleaned using a dry cloth or a cloth dampened with a soapy solution. Corrosive agents or solutions should never be used.

### Maintenance

The device is maintenance-free. In the event of damage (e.g. during transport and / or storage), repairs must not be carried out.

## 2.5     Description of inputs and outputs

**Supply voltage input 12 to 30 V DC**

Only a DC voltage in a range of 12 to 30 V may be connected to the power supply input. We recommend using a power supply 640 mA T KNX from our range.

| Caution |
|---|
| The supply voltage must be 12 to 30 V DC, or the device is powered via PoE (Power over Ethernet) according to IEEE 802.3af class 1. <br> Connecting the device to 230 V may destroy it! |

**KNX connection**

The supplied bus connection terminal is used to connect to the KNX bus.

| Note |
|---|
| The latest ETS 5 version is required for programming. |

**LAN connection**

The network connection is carried out via an Ethernet RJ45 interface for LAN networks. The network interface can be operated with a transmission speed of 10/100 Mbit/s. Network activity is indicated by the LAN/LINK LED on the front of the device.

## 2.6      Operating controls

There are no operating controls located on the IPsecure Router.

## 2.7      Display elements

Three indicator LEDs are located on the front of the IPsecure Router:

🟢             🟡             🟡

ON               LAN/LINK          Telegram

**ON**

- The LED lights for a few seconds after connection of the supply voltage.

- After the auxiliary voltage is connected, the LED initially lights up continuously.
  After approx. 40 seconds, the LED starts flashing until the startup process is complete and the LED lights up continuously again. Depending on the size of the filter table, this can take 5 to 60 seconds.

**LAN/LINK**

- The LED lights up when the auxiliary voltage is present and the Router is connected to an Ethernet network.

- The LED flashes when the device detects activity on the network, e.g. when data is exchanged.

**Telegram**

- The LED lights up when the Router is connected to a TP network and the startup process is complete (see "On" LED).

- The LED flashes when the device detects activity on the KNX subline TP1 (twisted pair 1), e.g. when data is exchanged.

## 3        Commissioning

The IPsecure Router is parameterized using the application and the Engineering Tool Software ETS.

The application can be found under *THEBEN AG/System components/Routing*.

For parameterization purposes, a PC or laptop with ETS and a connection to KNX are required.

### 3.1       Overview

The IPsecure Router is parameterized using the Engineering Tool Software (latest ETS 5 version).

Some functions (Unicast) are parameterized via a separate tool (IP Tool).

## 3.2 Parameters

This chapter describes the parameters of the IPsecure Router using the parameter windows.

The parameter windows feature a dynamic structure so that further parameters or whole parameter windows may be enabled depending on the parameterization and the function of the outputs.

The default values of the parameters are underlined, e.g.:

Options:     Yes
            No

### 3.2.1 Parameter window *KNX -> LAN*

In the parameter window *KNX -> LAN* it is possible to define the processing of telegrams from the KNX system to the LAN network.

| Note |
| --- |
| The device is supplied with the option *Route*. This is not the default setting in the application, but it simplifies commissioning.<br>The programmed setting will be adopted after the first download. |

| KNX->LAN | Group telegrams main groups 0...13 | Filter ▼ |
| --- | --- | --- |
| LAN->KNX | Group telegrams main groups 14...31 | Filter ▼ |
| IP settings | Physically addressed telegrams | ◉ Filter  ○ Block |
| | Broadcast telegrams | ◉ Route  ○ Block |
| | Telegram confirmation for group telegrams | ◉ Only if routed  ○ Always |
| | If free group address structure is used: | <--- NOTE ▼ |
| | Main group 0...13   => 1...28,671<br>Main group 14...31 => 28,672...65,535 | |

**Group telegrams
main groups 0...13**

Options:          <u>Filter</u>

                      Route

                      Block

This parameter defines whether telegrams with group addresses of the main groups 0 to 13 are filtered, routed or blocked.

- *Filter*: Telegrams with the group addresses of the main groups 0 to 13 from KNX to LAN are filtered in accordance with the filter table, which is automatically calculated by ETS.

- *Route*: All group telegrams of main groups 0 to 13 are routed without considering the filter table settings.

| Important |
|---|
| This setting is only useful for commissioning and diagnostics. It should not be used during normal operation. As this setting can overload the KNX lines, a loss of telegrams could occur. |

- *Block*: All group telegrams from KNX to LAN are blocked without considering the filter table settings.

**Group telegrams
main groups 14...31**

Options:          <u>Filter</u>

                      Route

                      Block

This parameter defines whether telegrams with group addresses of the main groups 14 to 31 are filtered, routed or blocked.

- *Filter*: Telegrams with the group addresses of the main groups 14 to 31 from KNX to LAN are filtered in accordance with the filter table, which is automatically calculated by ETS.

- *Route*: All group telegrams of main groups 14 ... 31 are routed without considering the filter table settings.

| Important |
|---|
| This setting is only useful for commissioning and diagnostics. It should not be used during normal operation. As this setting can overload the KNX lines, a loss of telegrams could occur. |

- *Block*: All group telegrams of main groups 14 ... 31 are blocked without considering the filter table settings.

**Physically addressed telegrams**

Options:          Filter
                  Block

This parameter defines whether physically addressed telegrams are filtered or blocked.

- *Filter*: Only telegrams from KNX to LAN that are to exit the line of the IPsecure Router to LAN are sent.

- *Block*: Physically addressed telegrams are not processed by the IP Router. It is not possible to send physically addressed telegrams from a line below the IPsecure Router to another line, e.g. during programming.

**Broadcast telegrams**

Options:          Route
                  Block

This parameter defines whether broadcast telegrams are routed or blocked.

- *Route*: Broadcast telegrams are routed.

- *Block*: Broadcast telegrams are not processed by the IP Router. It is not possible to send broadcast telegrams from a line below the IPsecure Router to another line, e.g. during programming.

The *Broadcast telegrams* parameter applies to "system broadcast telegrams" as well. See chapter, System broadcast, for details.

**Telegram confirmation**
**for group telegrams**

Options:          Only if routed
                  Always

This parameter defines whether the IPsecure Router is to acknowledge group telegrams.

- *Only if routed*: The group telegrams are acknowledged (send ACK) only if they are also routed by the IPsecure Router to LAN. Thus, only telegrams that are in the IPsecure Router filter table are acknowledged.

- *Always*: All group telegrams on KNX are acknowledged by the IP Router.

**If free group address structure is used:**

Main group 0...13 => 1...28,671
Main group 14...31 => 28,672...65,535

| Note |
|------|
| In the ETS 5 it is possible to not just assign two- or three-stage group addresses; it is possible to assign them freely. If the free group address view is selected, main group 0...13 corresponds to subgroup range 1...28,671 and main group 14...31 corresponds to subgroup range 28,672...65,535. Relevant details can be found in the help for the ETS. |

**3.2.1.1**      **Parameter window** *LAN -> KNX*

In the parameter window LAN -> KNX it is possible to define the processing of telegrams from the LAN network to the KNX system.



**Group telegrams
main groups 0...13**

Options:      <u>Filter</u>
                 Route
                 Block

This parameter defines whether telegrams with group addresses of the main groups 0 to 13 are filtered, routed or blocked.

- *Filter*: Telegrams with the group addresses of the main groups 0 to 13 from LAN to KNX are filtered in accordance with the filter table, which is automatically calculated by ETS.

- *Route*: All group telegrams of main groups 0 to 13 are routed without considering the filter table settings.

| Important |
|---|
| This setting is only useful for commissioning and diagnostics. It should not be used during normal operation. As this setting can overload the KNX lines, a loss of telegrams could occur. |

- *Block*: All group telegrams from LAN to KNX are blocked without considering the filter table settings.

**Group telegrams**
**main groups 14...31**

Options:      <u>Filter</u>
                Route
                Block

This parameter defines whether telegrams with group addresses of the main groups 14 to 31 are filtered, routed or blocked.

- *Filter*: Telegrams with the group addresses of the main groups 14 to 31 from LAN to KNX are filtered in accordance with the filter table, which is automatically calculated by ETS.

- *Route*: All group telegrams of main groups 14 ... 31 are routed without considering the filter table settings.

| Important |
|---|
| This setting is only useful for commissioning and diagnostics. It should not be used during normal operation. As this setting can overload the KNX lines, a loss of telegrams could occur. |

- *Block*: All group telegrams of main groups 14 to 31 from LAN to KNX are blocked.

**Physically addressed telegrams**

Options:      <u>Filter</u>
                Block

This parameter defines whether physically addressed telegrams are filtered or blocked.

- *Filter*: Only telegrams from LAN to KNX that are to exit the line of the IPsecure Router to LAN are sent.

- *Block*: Physically addressed telegrams are not processed by the IPsecure Router. With this setting it is not possible to send physically addressed telegrams from a line of a lower level than the IPsecure Router to another line, e.g. during programming.

**Broadcast telegrams**

Options:      <u>Route</u>
                Block

This parameter defines whether broadcast telegrams are routed or blocked.

- *Route*: Broadcast telegrams are routed.

- *Block*: Broadcast telegrams are not processed by the IPsecure Router. It is not possible to send broadcast telegrams from a line of a lower level than the IPsecure Router to another line, e.g. during programming.

**In case of errors repeat telegrams**

Options:        <u>Yes</u>
No
User-defined

- *Yes:* If an error is detected when a telegram is transmitted, the telegram is repeated up to three times.

- *No:* The telegram is not repeated.

- *User-defined:* The reaction can be set individually for different types of telegram.

The following dependent parameters appear when the *User-defined* option is selected:

**Repeat group addressed telegrams**

Options:        <u>Yes</u>
No

- *Yes:* If an error is detected when a group addressed telegram is transmitted, the telegram is repeated up to three times.

- *No:* The telegram is not repeated.

**Repeat physically addressed telegrams**

Options:        <u>Yes</u>
No

- *Yes:* If an error is detected when a physically addressed telegram is transmitted, the telegram is repeated up to three times.

- *No:* The telegram is not repeated.

**Repeat broadcast telegrams**

Options:        <u>Yes</u>
No

- *Yes:* If an error is detected when a broadcast telegram is transmitted, the telegram is repeated up to three times.

- *No:* The telegram is not repeated.

**If free group address structure is used:**

**Main group 0...13 => 1...28,671**
**Main group 14...31 => 28,672...65,535**

| Note |
| --- |
| In the ETS 5 it is possible to not just assign two- or three-stage group addresses; it is possible to assign them freely. If the free group address view is selected, main group 0...13 corresponds to subgroup range 1...28,671 and main group 14...31 corresponds to subgroup range 28,672...65,535. Relevant details can be found in the help for the ETS. |

**3.2.1.2**     **Parameter window** *IP settings*

Parameter window *IP settings* is used to set how the IPsecure Router communicates via IP.



**Type of IP communication**

Options:        <u>Multicast</u>
                Unicast

The type of IP communication defines the type of telegrams that the IPsecure Router sends on the IP network.

- *Multicast*: This is the standard communication using KNX-IP devices for KNXnet/IP from the KNX Association. This setting should only be changed if the existing network demands that telegrams are sent as unicast.

    For setting the routing multicast address, see [Routing multicast address](#).

- *Unicast*: The routing for the device is switched off.

    This special communication type does not comply with the KNXnet/IP specification. The Theben Tool is required for configuration.
    The *Unicast* type of communication cannot be used when the device is operated in KNX Secure mode. If *Unicast* is selected when KNX Secure mode is active, the ETS switches to *Multicast*. The *Unicast* parameterization in the application will be ignored in this case.

    KNX Secure mode must be switched off in the ETS in order to be able to use the *Unicast* type of communication.

| Note |
| --- |
| A description of the functions can be found in the online Help of the IP Tool. |

The following message appears if *Multicast* or *Unicast* is selected:

**The device name, IP address and tunneling servers are set in the Properties window of ETS.**

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The following note also appears with the selection *Unicast*:

**Attention! This setting switches off routing for the device.**
**The IP telegrams will now be sent as unicast to up to nine target addresses.**

**Unicast configuration is performed with the Theben IP Tool.**

See description of unicast communication, chapter [KNX telegrams in the network](#).

The IP Tool can be downloaded for free from our website (www.theben.de/en/downloads_en*)*.

No ETS or installation of Falcon is required for the IP Tool.

System requirements: system with Windows 7 operating system (service pack 3) or later and .NET Framework 4.0.

The integrated Falcon 5.0 supports only USB and IP interfaces (no RS232).

| Note |
| --- |
| A description of the functions can be found in the online Help of the IP Tool. |

| Important |
| --- |
| Unicast communication cannot be used when KNX Secure mode is activated. |
| If KNX Secure mode is activated and the parameter *Type of IP communication* is set to *Unicast*, multicast communication will be activated anyway. |
| A corresponding message will be displayed when the unicast addresses are parameterized via the IP Tool. |

The remaining configuration of the IP parameters (device name, assignment of the IP address by DHCP or static) takes place in the Properties window of the ETS takes place in the corresponding Properties window of ETS.



The device name can be entered in the *Settings* Properties window. The device name loaded into the device can be changed in the *Name* field.

The device name is used for identification of the device on LAN. After a search query, e.g. by ETS, every KNXnet/IP device reports its name and can be allocated accordingly. For example, the installation location can be identified by the names assigned to the devices, e.g. IP Router, HALL, SUB7, etc.

| Note |
| --- |
| The default device name on delivery is "IPsecure Router". After the first download, the device name entered in the Properties window of ETS is loaded into the device. |

| Caution |
| --- |
| Only the first 30 characters of the device name are loaded into the device; the rest is truncated. |

The IP address can be defined in the *IP* Properties window.

| Properties | | | > |
|---|---|---|---|
| ⚙ **Settings** | ▤ **IP** | 🗨 **Comments** | ⓘ **Information** |

○ Obtain an IP address automatically

◉ Use a static IP address

**IP Address**

127.0.0.1

**Subnet Mask**

255.255.255.255

**Default Gateway**

127.0.0.1

**MAC Address**

Unknown

**Multicast Address**

224.0.23.12

🛡 **Commissioning Password**

Wrr(.0Q;

*Good*

🛡 **Authentication Code**

_eT3j_o>

*Good*

The following options are available for setting the IP address:

Options:     <u>Obtain an IP address automatically</u>
             Use the following IP address

- *Obtain an IP address automatically*: In the default setting the IPsecure Router expects the assignment of an IP address by a DHCP (dynamic host configuration protocol) server. This server responds to a request by assigning a free IP address to the device. If a DHCP server is not available in the network or it does not respond within 30 seconds, the device starts an auto IP procedure. It assigns itself an address from the reserved range for auto IP addresses (169.254.1.0 to 196.254.254.255).

    For information about DHCP: see chapter <u>Assignment of IP address</u>.

- *Use a static IP address:* If no DHCP server is installed on the network or if the IP address should remain the same, it can be assigned as static.

    When assigning static IP addresses, ensure that each device receives a different IP address.

| Note |
| --- |
| The routing multicast address is displayed only here. <br> For setting the routing multicast address, see Multicast address |

| Note |
| --- |
| The MAC address is read from the device after a download. <br> The MAC address is additionally labeled on the device, or it can be determined via the IP Tool. |

| Note |
| --- |
| A description of the functions can be found in the online Help of the IP Tool. |
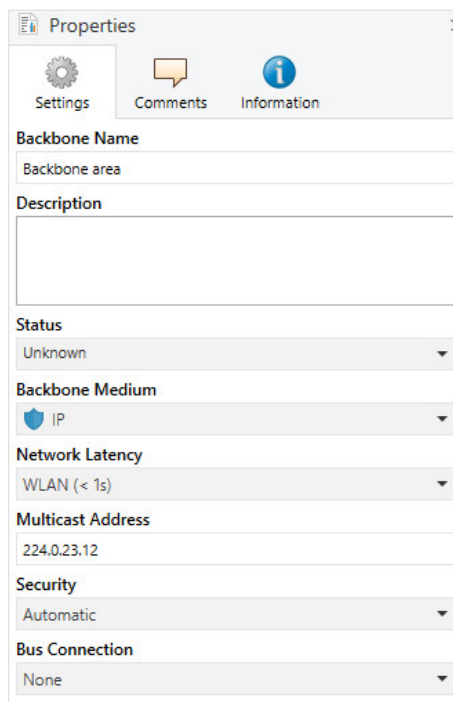
**Routing multicast address
(default = 224.0.23.12)**

Options:        224.0.23.12

The routing multicast address defines the target address of the IP telegrams of the IP Router. The preset address 224.0.23.12 is the defined address for the KNXnet/IP from the KNX Association in conjunction with IANA for KNX-IP devices. This address should be retained and only changed if the existing network demands that another address from the range 224.0.0.0 to 239.255.255.255 (reserved range for multicast addresses) be used.

The routing multicast address is set in ETS in the view *Topology* (topology selection; the routing multicast address can then be set on the *Settings* tab in the Properties window):



| Important |
|---|
| All IPsecure Routers or other KNXnet/IP devices that are required to exchange telegrams on the IP network must use the same routing multicast address. |

### 3.3 Group objects

The IPsecure Router has no KNX group objects.

### 3.4 Use of the integrated tunneling servers

The IPsecure Router offers five additional physical addresses, which can be used for a tunneling connection. These so-called tunneling servers can be used with ETS as a programming interface or with another client, e.g. a visual display system.
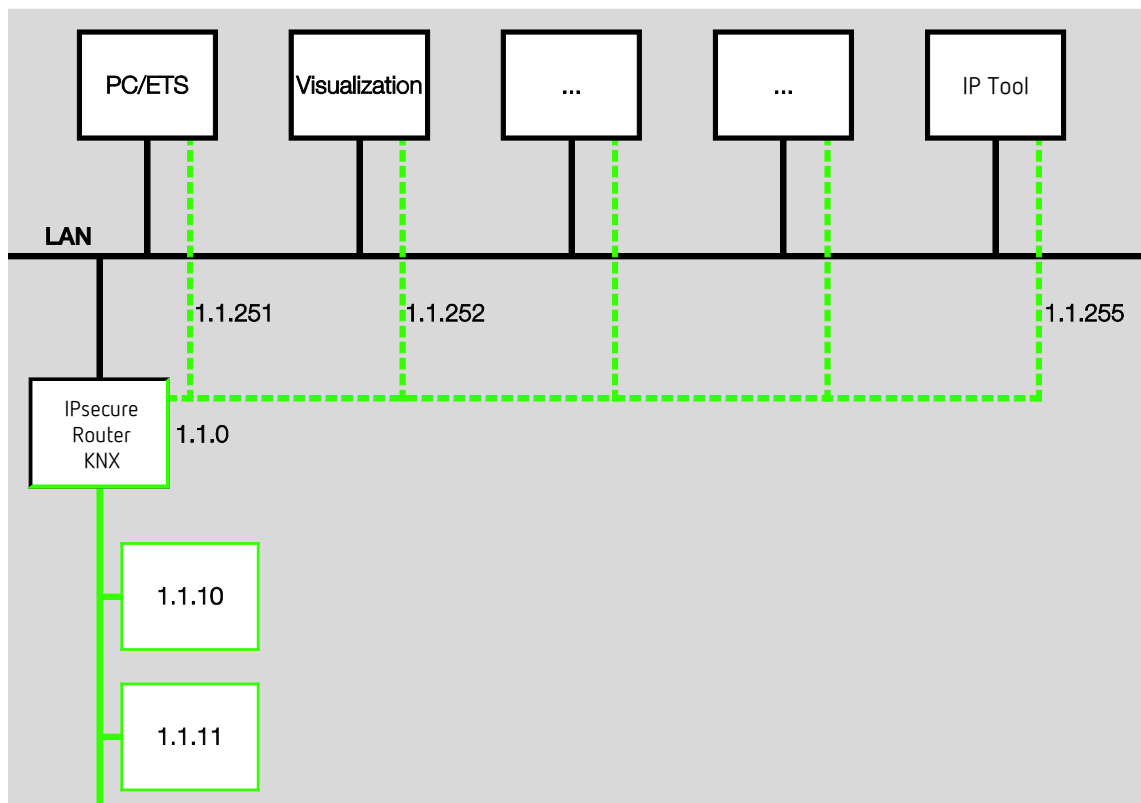


Tunneling involves a client connecting to a bus line. The tunneling process uses UDP, but includes a data link layer so that telegrams are repeated in the event of an error.

Tunneling V2 is supported from ETS 5. TCP is used instead of UDP here, and the TCP's data link layer is used for transmission

| Note |
| --- |
| The physical address for the tunneling connection must fit the topology. Therefore, the addresses must be selected from the address range of the subordinate line. On delivery, all tunneling servers have the address 15.15.100.<br>In ETS 5, the first five free addresses in the line are assigned automatically after the Router has been inserted into a line. |

The tunneling servers can also be encrypted with KNX Secure. When KNX Secure mode is activated, a client will need the password assigned in the ETS. For details, see chapter, KNX Secure.

**3.4.1**          **Settings in ETS 5**

An additional Properties window is available in ETS for setting the additional physical addresses.

After insertion of the Router into the line, the ETS automatically reserves the first five free addresses of this line for the tunneling servers of the Router. This is a property of the ETS and cannot be changed.

The addresses will be available in the device after the first download.

If this is not desired, the setting can be changed manually in the Properties window.
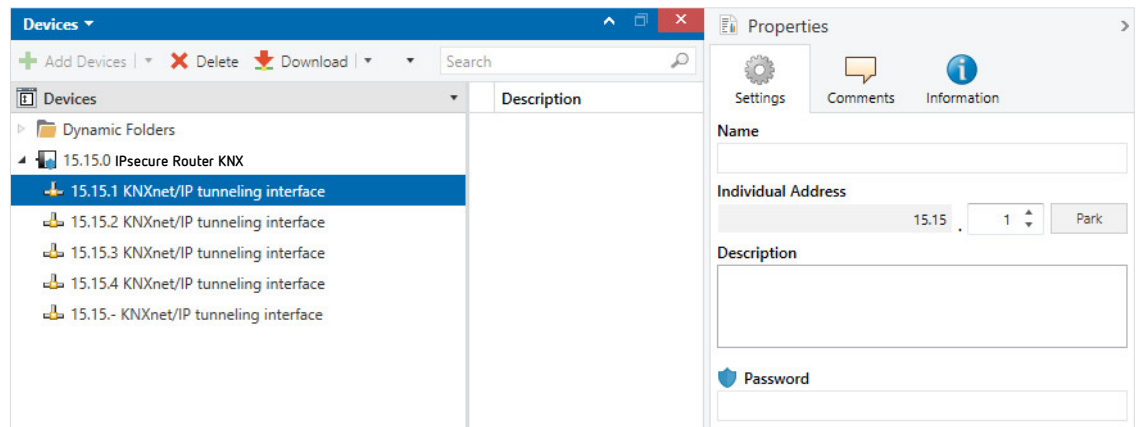


To change the address, mark the current device address or additional address and then select the desired numeral using the up or down arrow key. The changed address is saved when another address is marked.

The changed addresses are adopted by the device only after a download.


**Park**

If the option Park is activated for a tunnel, this tunnel will receive the address 15.15.255.

If the option Park is selected for all tunneling servers, all tunneling servers will be assigned the address 15.15.255. Only one tunneling server is available as a result.

| 3.5 | KNX Secure |
|-----|------------|

The IPsecure Router is a KNX device according to the KNX Secure standard. In other words, the device can be put into operation in a secure manner. Communication on the IP backbone is secure (all KNX IP devices must support the KNXnet/IP Security protocol for this purpose), and the tunneling connections are encrypted.

The following information must therefore be taken into account during device commissioning:

- It is essential to assign a project password as soon as a KNX Secure device is imported into a project. This will protect the project against unauthorized access.
  **The password must be kept in a safe place – access to the project is not possible without it (not even the KNX Association or Theben will be able to access it**)!

-  A commissioning key is required when commissioning a KNX Secure device (first download). This key (FDSK = Factory Default Setup Key) is included on a sticker on the side of the device, and it must imported into the ETS prior to the first download.

  o On the first download of the device, a window opens in the ETS to prompt the user to enter the key. The certificate can also be read using a QR scanner (recommended).

  o Alternatively, the certificates of all Secure devices can be entered in the ETS beforehand. This is done on the "Security" tab on the project overview page.

  o Two FDSK stickers are applied on the device. One of them can be used for the project documentation, and the other one can remain on the device.
  **Without the FDSK, it will no longer be possible to operate the device in KNX Secure mode after a reset.**

The FDSK is required only for initial commissioning. The ETS then assigns new keys. The FDSK will be required again only if the device was reset to its factory settings (e.g. If the device is to be used in a different system with a different ETS project).

The ETS assigns the "backbone" key to all KNX IP Secure devices in the project, and also generates separate passwords for each tunneling server. The passwords can be changed as required. ETS generates and administers the keys. Keys and passwords can be exported as needed (e.g. if a client would like to access one of the tunnels).

The Router can be reset to its factory settings if necessary, see chapter, <u>Unloading the device and resetting to factory settings</u>.

# 4 Planning and application

## 4.1 The IPsecure Router in the network

The IPsecure Router is designed for use in 10/100 BaseT networks compliant to IEEE 802.3. The device features an AutoSensing function and sets the baud rate (10 or 100 Mbit) automatically.

### 4.1.1 Assignment of IP address

**DHCP/AutoIP**

The IP address of the device can be received from a DHCP server. For this purpose the automatic assignment setting of the IP address in ETS is required, see IP settings. If no DHCP server is found with this setting, the device starts an AutoIP procedure and autonomously assigns itself an IP address from the range 169.254.xxx.yyy.

The IP address that the device receives (via DHCP or AutoIP) during startup will be retained until

- the next reboot (switching off/on or reprogramming).
- a DHCP server is available.
- the DHCP lease expires.

**No DHCP server available during start-up:**

If no DHCP server is available during startup of the IP Router Secure, the device will assign itself an AutoIP address. The Router then cyclically (three telegrams at intervals of 3 seconds, followed by a pause of 20 seconds) searches for a DHCP server. As soon as a server is available again, the address assigned by the DHCP server is used.

**DHCP server fails (device has already received IP address from the DHCP):**

Requests to extend the utilization rights for this IP address remain unanswered until the end of the lease time (IP address validity time; this is defined by the DHCP server during assignment of the IP address). The IP address continues to be used.
At the end of the lease time or after a download, the device searches for an AutoIP address.

**Static IP address**

If the IP address of the IPsecure Router is to have a fixed assignment, a static IP address (as well as a subnet mask and a default gateway) can be set in the ETS, see parameter window IP settings.

| 4.1.2 | KNX telegrams in the network |
|-------|------------------------------|

| Note |
|------|
| When designing the KNX system it is important to note that the number of transferred telegrams is also limited when the IPsecure Router is used. Due to the high baud rate on the IP side (10/100 Mbit/s), telegrams may be lost with high levels of data exchange on the TP1 line (9.6 kbit/s) for system reasons. |

### Multicast

Multicast designates communication of a transmitter with a group of receivers. The IPsecure Router sends the KNX telegrams packaged as UPD/IP telegrams on the IP network, and all IPsecure Router devices parameterized with the same multicast address receive and evaluate these telegrams. If a telegram is intended for the corresponding subline, the IPsecure Router routes the telegram into the line. Otherwise, it is rejected.

The IPsecure Router sends telegrams from the KNX to the IP network in accordance with the KNXnet/IP protocol specification. These telegrams are sent in the default setting as multicast telegrams to the multicast IP address 224.0.23.12 port 3671. This multicast IP address is the defined address for the KNXnet/IP from the KNX Association in conjunction with IANA for KNX IP devices. This address should be retained. It should be changed only if the existing network demands that another address be used.

In order for several IPsecure Router devices to communicate with one another in a network, multicast communication must be possible between the devices. Depending on the type of network and the setting of the network components used, e.g. routers, switches or firewalls, the multicast IP address 224.0.23.12 may need to be enabled explicitly beforehand. Please discuss the topic with your network administrator.

For further information, see chapter, Parameter window IP settings.

### Unicast

If multicast communication is not possible in a network, the Theben IP Routers can also communicate with each other via unicast. Up to ten Theben IP Routers can be combined to form a unicast group. Each Router is then assigned nine IP addresses to which it sends its telegrams.

Unicast generally refers to communication between a transmitter and a receiver. In other words, the Router sets up a communication connection to every IPsecure Router within the unicast group.

Automatic configuration of this unicast group is simple with the Theben IP Tool.

It is also possible to link a client (e.g. a visual display system) with this unicast group. In this case, one of the ten unicast addresses is used by the client and up to nine IP Routers can be linked.

The exact description of how configuration with the IP Tool works can be found in the Help of the IP Tool (see chapter The IP Tool).

| Note |
|------|
| As soon as the parameter is changed to *Unicast* under Type of IP communication in the ETS, the function *Multicast* is deactivated. The devices can then no longer be programmed via multicast routing; they can be programmed only via one of the integrated tunneling servers or a separate programming interface.<br>However, the type of communication will be changed only when parameterization with the IP Tool has taken place. Until then, the Router will remain internally set to multicast. This offers the advantage of programming the Router via multicast. |

For more information, see parameter window IP settings.

| Note |
|------|
| A description of the functions can be found in the online Help of the IP Tool. |

| Note |
| --- |
| • If unicast is used as the type of communication, it must be ensured that the IP address of the Router does not change during operation. For this purpose, either a static IP address should be assigned or a corresponding setting should be made for the DHCP server.<br><br>• With the ETS, all IP parameters are also updated when the physical address is changed. In other words, even if only the option *Programming physical address* is selected in the ETS, the device name, the multicast address, the type of IP communication (DHCP, AutoIP, fixed), the IP address, the subnet mask, the default gateway and all tunneling addresses are loaded again. If the IP address changes in the process, unicast configuration with the IP  Tool must be repeated. |

The *Unicast* type of communication cannot be used when the device is operated in KNX Secure mode. If *Unicast* is selected when KNX Secure mode is active, the ETS switches to *Multicast*. The *Unicast* parameterization in the application will be ignored in this case.

KNX Secure mode must be switched off in the ETS in order to be able to use the *Unicast* type of communication.

### 4.1.3 Monitoring

An active tunneling connection should be monitored via a "CONNECTIONSTATE_REQUEST", but this is also possible via T-Connect. Monitoring a device via T-Connect can have drawbacks, e.g. in case of monitoring, programming or scanning processes in the line.

### 4.1.4 System broadcast

All IP devices that are to communicate with each other in a KNX system must use the same multicast address. The address 224.0.23.12 port 3671 is used by default; see Multicast.

Changing the multicast address in a system could lead to problems during commissioning. If the multicast address of the closest Router is changed first, for example, it will switch to the new multicast address after programming. It will then no longer be able to access the rest of the system, and the remaining Routers in the system can no longer be programmed.

ETS can then reach these devices via the "system broadcast address." The system broadcast address can be used to change the multicast address of all KNX IP devices, as well as the backbone key. This will work only if the device is not operated in KNX Secure mode or if the backbone key is known to the ETS.

Routing of system broadcast telegrams can be set via the parameter *Route/Block broadcast telegrams*. In other words, this parameter is effective for (standard) broadcast telegrams and system broadcast telegrams.

### 4.1.5 IGMP

The device supports IGMP snooping version V3.

IGMP snooping is the capability of routing multicast routing traffic only to where it is actually needed. The IT infrastructure and the device must use the same IGMP version, otherwise this IGMP mechanism will not work.

To enable a multicast address, the device logs in at this multicast address with a membership report.

**4.1.6**    **IPsecure Router as an area coupler**

The IPsecure Router in a KNX system can assume the function of an area coupler in a KNX system. For this purpose it must receive the physical address of an area coupler (1.0.0...15.0.0). Up to 15 areas can be defined with area couplers in an ETS project.

The following figure shows this topology with IP Router Secure devices as area couplers and KNX Line Couplers (LK/S).
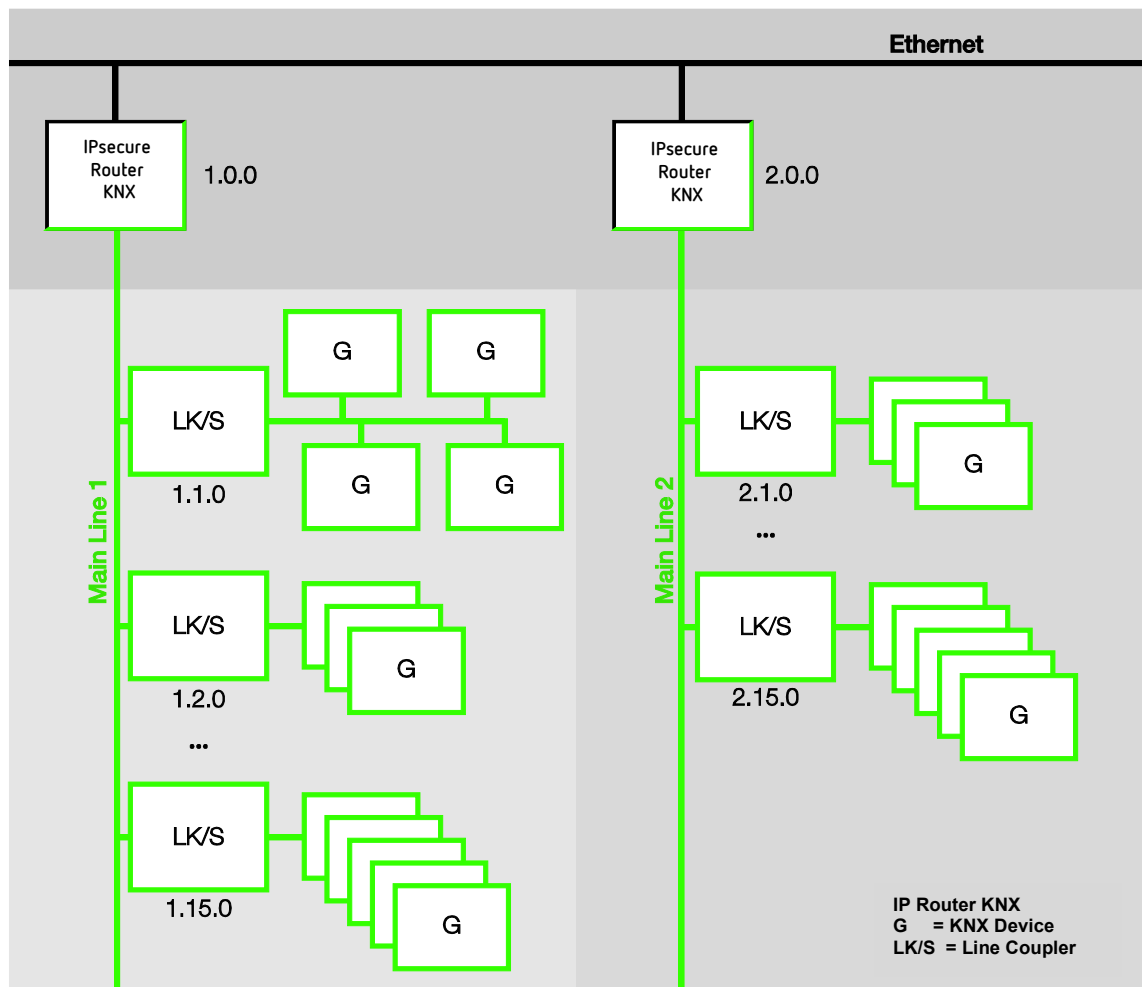
**4.1.7**  **IPsecure Router as a line coupler**

The IPsecure Router in a KNX system can assume the function of a line coupler. To do this it must be given the physical address of a line coupler (1.1.0...15.15.0).

The following illustration shows the topology with IPsecure Routers as line couplers.
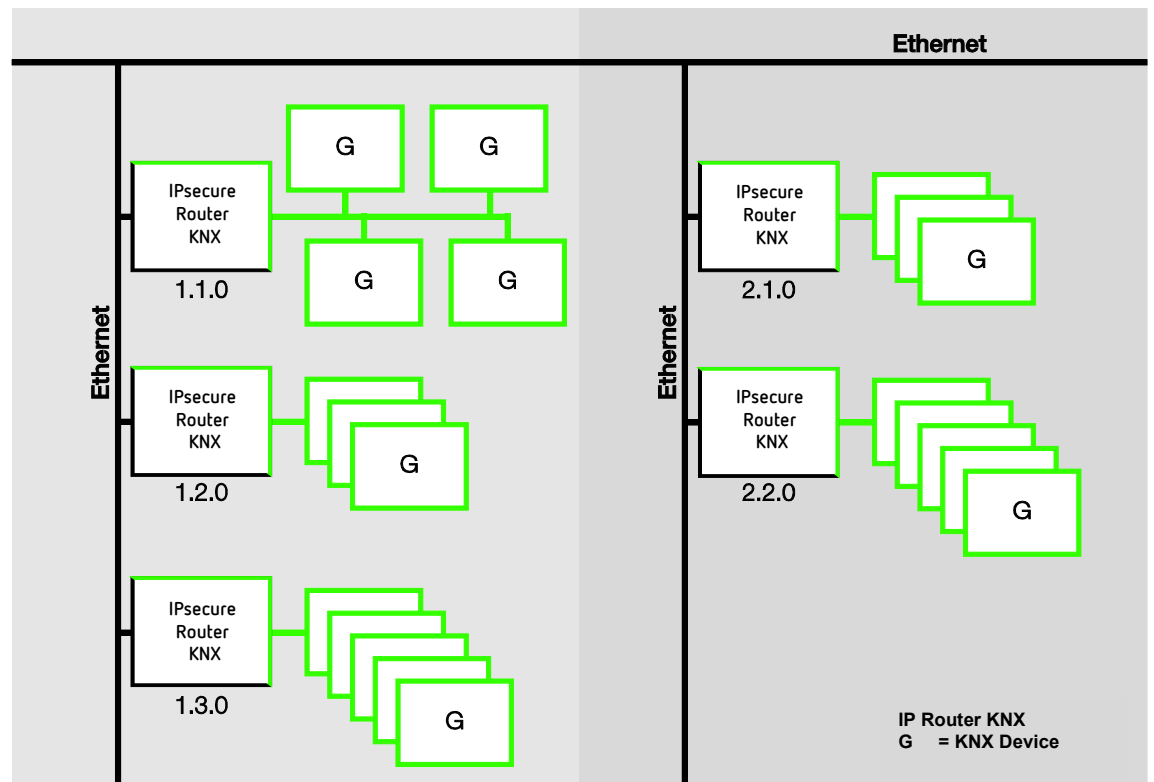
**4.1.8**     **Mixed topology**

If it is necessary in a KNX system to use the IPsecure Router as an area coupler at one point, e.g. office complex, and as a line coupler at another point, e.g. a remote underground garage, this is possible.

It is only necessary to ensure that the IPsecure Router as the line coupler uses the line coupler address from a free area, e.g. 2.1.0 in the figure.
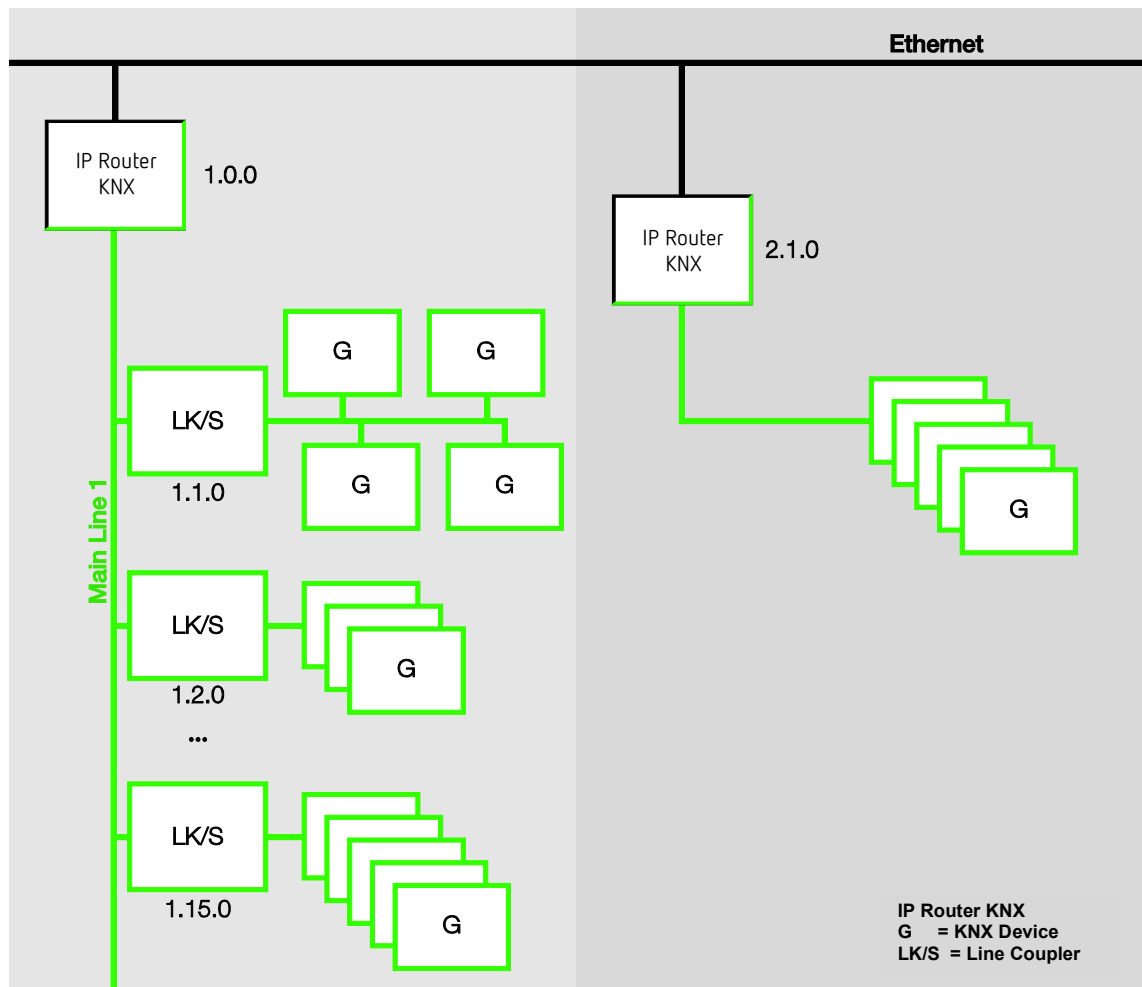
## 4.2 The IP Tool

The Theben IP Tool is required in order to set certain functions of the Theben IP devices.

It simplifies commissioning on the IP side.

Go to the start page of the IP Tool, click *Connect* and then click *IP devices* in the window that then appears.
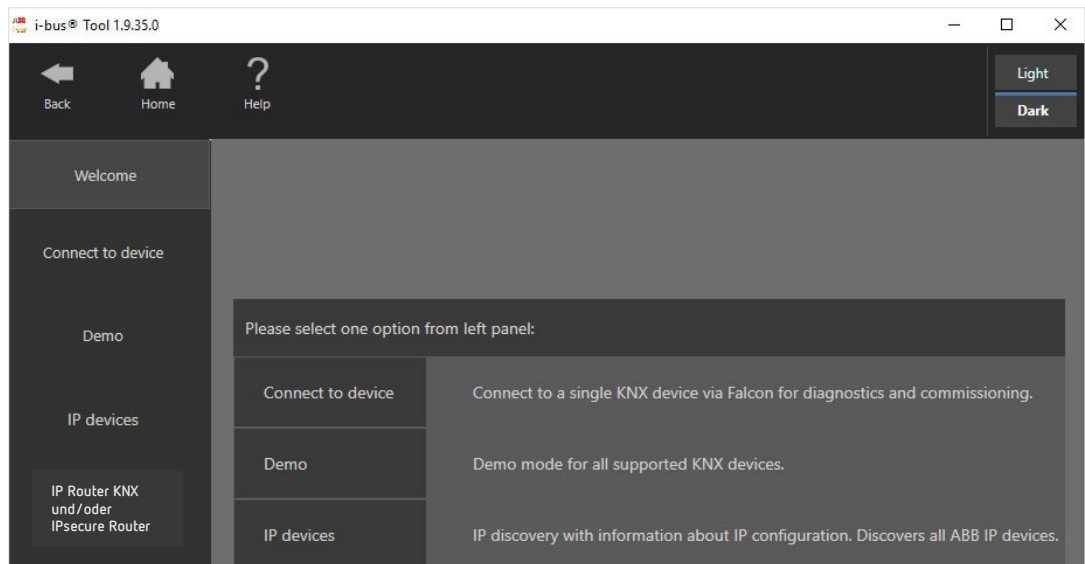
**Ribbon: switching between Discovery, Firmware Update and Unicast**
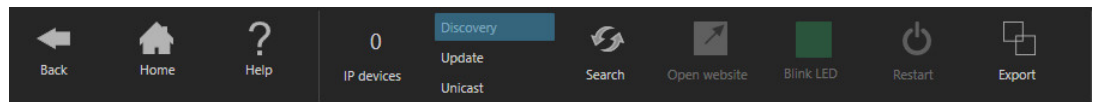
Click the corresponding button to select *Discovery* or *Unicast* mode.

**Discovery**

Select *Discovery* mode in the ribbon area. This function serves to find and display Theben IP devices in the network. Not all information is displayed when the IPsecure Router is operated in KNX Secure mode.

| Note |
| --- |
| A description of the functions can be found in the online help of the IP Tool. |

**Firmware update**

The device cannot be updated with the IP Tool in KNX Secure mode. In this case, the firmware update will be possible only with the ETS app "KNX Bus Update." The app can be loaded free of charge from the KNX Online Shop.

Select *Update* mode in the ribbon area. If this should become necessary, the firmware can be updated using this function.

| Important |
| --- |
| The firmware must be downloaded from the Internet first (www.theben.de / en / downloads_en). For this purpose the IP Tool connects to a server **if an Internet connection is available**. <br> An Internet connection is then no longer necessary in order to update the system devices. |

| Important |
| --- |
| During the update process, the KNX bus (TP) must be connected in addition to the IP network (LAN) so that the KNX parameters can be restored correctly. Otherwise, the update process will fail. |
| It must be ensured that no voltage failure (KNX or IP) occurs during the update process, otherwise the device can be destroyed. |

| Note |
| --- |
| A description of the functions can be found in the online help of the IP Tool. |

| Note |
| --- |
| The IP Tool must be run with administrator rights for the update process. |

**Unicast**

Select *Unicast* mode in the ribbon area.

This function is available only if the parameter *Type of IP communication* has been set to *Unicast* in the ETS application first.

| Note |
| --- |
| A description of the functions can be found in the online Help of the IP Tool. |

# IPsecure Router KNX
## Third party software components, notices and OSS license texts

## A        Appendix

## Third party software components, notices and OSS license texts

## Content

# IPsecure Router KNX
## Third party software components, notices and OSS license texts

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- memstat (v0.8)

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- **at91ft12 (v1.0)**

- **at91gpbr (v1.0)**

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- gdbserver (v7.2.50.20100908-cvs)

- glibc (v2.11.1)

- kmod (v8)

- libgcc (v4.5.1)

- Linux (v3.2.26)

- mtd-utils (v1.4.9)

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- XML-RPC++ (v0.7)

**under Lesser General Public License (LGPL) Version 3:**

- binutils (v2.21)

- gdbserver (v7.2.50.20100908-cvs)

- gmplib (v5.0.4)

- libgcc (v4.5.1)

- uclibc (v0.9.31.1)

**under GNU FDLv1.3**

- popt (v1.16)

**under GNU GCC Runtime Library Exception**

- libgcc (v4.5.1)

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- AT91Bootstrap 1.9 (v1.9)

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- dropbear sshd (v2012.55)

- libpcap (v1.2.1)

- libxml2 (v2.7.8)

- lsof (v4.85)

- OpenSSL (v1.0.1g)

- Pcre (v8.30)

- util Linux (v2.20.1)

- zlib (v1.2.6)

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# IPsecure Router KNX
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### Buildroot (v2012-05):

Buildroot is a simple, efficient and easy-to-use tool to generate embedded

Linux systems through cross-compilation.


The documentation can be found in docs/manual. You can generate a text

document with 'make manual-text' and read output/docs/manual/manual.text.

Online documentation can be found at http://buildroot.org/docs.html


To build and use the buildroot stuff, do the following:


1) run 'make menuconfig'

2) select the target architecture and the packages you wish to compile

3) run 'make'

4) wait while it compiles

5) find the kernel, bootloader, root filesystem, etc. in output/images


You do not need to be root to build or run buildroot. Have fun!


Buildroot comes with a basic configuration for a number of boards. Run

'make list-defconfigs' to view the list of provided configurations.


Please feed suggestions, bug reports, insults, and bribes back to the

buildroot mailing list: buildroot@buildroot.org

You can also find us on #buildroot on Freenode IRC.

# IPsecure Router KNX
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## Busybox (v1.20.1):

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Except for actions to protect intellectual property

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## Dropbear sshd (v2012.55):

Dropbear contains a number of components from different sources, hence there

are a few licenses and authors involved. All licenses are fairly

non-restrictive.

The majority of code is written by Matt Johnston, under the license below.

Portions of the client-mode work are (c) 2004 Mihnea Stoenescu, under the

same license:

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=====


LibTomCrypt and LibTomMath are written by Tom St Denis, and are Public Domain.


=====


sshpty.c is taken from OpenSSH 3.5p1,

 Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland

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can be used freely for any purpose. Any derived versions of this

software must be clearly marked as such, and if the derived work is

incompatible with the protocol description in the RFC file, it must be

called by a name other than "ssh" or "Secure Shell". "


=====


loginrec.c

loginrec.h

atomicio.h

atomicio.c

and strlcat() (included in util.c) are from OpenSSH 3.6.1p2, and are licensed

under the 2 point BSD license.


loginrec is written primarily by Andre Lucas, atomicio.c by Theo de Raadt.


strlcat() is (c) Todd C. Miller


=====


Import code in keyimport.c is modified from PuTTY's import.c, licensed as

follows:


PuTTY is copyright 1997-2003 Simon Tatham.


Portions copyright Robert de Bath, Joris van Rantwijk, Delian

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Delchev, Andreas Schultz, Jeroen Massar, Wez Furlong, Nicolas Barry,

Justin Bradford, and CORE SDI S.A.


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### Expat (v2.1.0):

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## Gdbserver (v7.2.50.20100908-cvs):

README for GNU development tools

This directory contains various GNU compilers, assemblers, linkers,

debuggers, etc., plus their support routines, definitions, and documentation.

If you are receiving this as part of a GDB release, see the file gdb/README.

If with a binutils release, see binutils/README; if with a libg++ release,

see libg++/README, etc. That'll give you info about this

package -- supported targets, how to use it, how to report bugs, etc.

It is now possible to automatically configure and build a variety of

tools with one command. To build all of the tools contained herein,

run the ``configure'' script here, e.g.:

    ./configure

    make

To install them (by default in /usr/local/bin, /usr/local/lib, etc),

then do:

    make install

(If the configure script can't determine your type of computer, give it

the name as an argument, for instance ``./configure sun4''. You can

use the script ``config.sub'' to test whether a name is recognized; if

it is, config.sub translates it to a triplet specifying CPU, vendor,

and OS.)

If you have more than one compiler on your system, it is often best to

explicitly set CC in the environment before running configure, and to

also set CC when running make. For example (assuming sh/bash/ksh):


```
CC=gcc ./configure

make
```


A similar example using csh:


```
setenv CC gcc

./configure

make
```


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COPYING.LIB in the various directories, for a description of the

GNU General Public License terms under which you can copy the files.


REPORTING BUGS: Again, see gdb/README, binutils/README, etc., for info

on where and how to report problems.

-----------------------------------------------------------------------------------------------------------------------------

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### Glib (v2.30.2):

General Information

====================


This is GLib version 2.30.2. GLib is the low-level core

library that forms the basis for projects such as GTK+ and GNOME. It

provides data structure handling for C, portability wrappers, and

interfaces for such runtime functionality as an event loop, threads,

dynamic loading, and an object system.


The official ftp site is:

 ftp://ftp.gtk.org/pub/glib


The official web site is:

 http://www.gtk.org/


Information about mailing lists can be found at

 http://www.gtk.org/mailing-lists.html


To subscribe: mail -s subscribe gtk-list-request@gnome.org < /dev/null

(Send mail to gtk-list-request@gnome.org with the subject "subscribe")


Installation

============


See the file 'INSTALL'

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Notes about GLib 2.30

========================

* GObject includes a generic marshaller, g_cclosure_marshal_generic.

 To use it, simply specify NULL as the marshaller in g_signal_new().

 The generic marshaller is implemented with libffi, and consequently

 GObject depends on libffi now.

Notes about GLib 2.28

========================

* The GApplication API has changed compared to the version that was

 included in the 2.25 development snapshots. Existing users will need

 adjustments.

Notes about GLib 2.26

========================

* Nothing noteworthy.

Notes about GLib 2.24

========================

* It is now allowed to call g_thread_init(NULL) multiple times, and

 to call glib functions before g_thread_init(NULL) is called

 (although the later is mainly a change in docs as this worked before

 too). See the GThread reference documentation for the details.

* GObject now links to GThread and threads are enabled automatically

 when g_type_init() is called.

* GObject no longer allows to call g_object_set() on construct-only properties

 while an object is being initialized. If this behavior is needed, setting a

 custom constructor that just chains up will re-enable this functionality.

* GMappedFile on an empty file now returns NULL for the contents instead of

 returning an empty string. The documentation specifically states that code

 may not rely on nul-termination here so any breakage caused by this change

 is a bug in application code.

Notes about GLib 2.22

=====================

* Repeated calls to g_simple_async_result_set_op_res_gpointer used

 to leak the data. This has been fixed to always call the provided

 destroy notify.

Notes about GLib 2.20

=====================

* The functions for launching applications (e.g. g_app_info_launch() +

 friends) now passes a FUSE file:// URI if possible (requires gvfs

 with the FUSE daemon to be running and operational). With gvfs 2.26,

 FUSE file:// URIs will be mapped back to gio URIs in the GFile

constructors. The intent of this change is to better integrate

POSIX-only applications, see bug #528670 for the rationale. The

only user-visible change is when an application needs to examine an

URI passed to it (e.g. as a positional parameter). Instead of

looking at the given URI, the application will now need to look at

the result of g_file_get_uri() after having constructed a GFile

object with the given URI.


Notes about GLib 2.18

======================


* The recommended way of using GLib has always been to only include the

 toplevel headers glib.h, glib-object.h and gio.h. GLib enforces this by

 generating an error when individual headers are directly included.

 To help with the transition, the enforcement is not turned on by

 default for GLib headers (it is turned on for GObject and GIO).

 To turn it on, define the preprocessor symbol G_DISABLE_SINGLE_INCLUDES.


Notes about GLib 2.16

======================


* GLib now includes GIO, which adds optional dependencies against libattr

 and libselinux for extended attribute and SELinux support. Use

 --disable-xattr and --disable-selinux to build without these.

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Notes about GLib 2.10

=====================

* The functions g_snprintf() and g_vsnprintf() have been removed from

 the gprintf.h header, since they are already declared in glib.h. This

 doesn't break documented use of gprintf.h, but people have been known

 to include gprintf.h without including glib.h.


* The Unicode support has been updated to Unicode 4.1. This adds several

 new members to the GUnicodeBreakType enumeration.


* The support for Solaris threads has been retired. Solaris has provided

 POSIX threads for long enough now to have them available on every

 Solaris platform.


* 'make check' has been changed to validate translations by calling

 msgfmt with the -c option. As a result, it may fail on systems with

 older gettext implementations (GNU gettext < 0.14.1, or Solaris gettext).

 'make check' will also fail on systems where the C compiler does not

 support ELF visibility attributes.


* The GMemChunk API has been deprecated in favour of a new 'slice

 allocator'. See the g_slice documentation for more details.


* A new type, GInitiallyUnowned, has been introduced, which is

 intended to serve as a common implementation of the 'floating reference'

 concept that is e.g. used by GtkObject. Note that changing the

inheritance hierarchy of a type can cause problems for language

bindings and other code which needs to work closely with the type

system. Therefore, switching to GInitiallyUnowned should be done

carefully. g_object_compat_control() has been added to GLib 2.8.5

to help with the transition.


Notes about GLib 2.6.0

========================


* GLib 2.6 introduces the concept of 'GLib filename encoding', which is the

on-disk encoding on Unix, but UTF-8 on Windows. All GLib functions

returning or accepting pathnames have been changed to expect

filenames in this encoding, and the common POSIX functions dealing

with pathnames have been wrapped. These wrappers are declared in the

header <glib/gstdio.h> which must be included explicitly; it is not

included through <glib.h>.


On current (NT-based) Windows versions, where the on-disk file names

are Unicode, these wrappers use the wide-character API in the C

library. Thus applications can handle file names containing any

Unicode characters through GLib's own API and its POSIX wrappers,

not just file names restricted to characters in the system codepage.


To keep binary compatibility with applications compiled against

older versions of GLib, the Windows DLL still provides entry points

with the old semantics using the old names, and applications

compiled against GLib 2.6 will actually use new names for the

functions. This is transparent to the programmer.

When compiling against GLib 2.6, applications intended to be

portable to Windows must take the UTF-8 file name encoding into

consideration, and use the gstdio wrappers to access files whose

names have been constructed from strings returned from GLib.

* Likewise, g_get_user_name() and g_get_real_name() have been changed

to return UTF-8 on Windows, while keeping the old semantics for

applications compiled against older versions of GLib.

* The GLib uses an '_' prefix to indicate private symbols that

must not be used by applications. On some platforms, symbols beginning

with prefixes such as _g will be exported from the library, on others not.

In no case can applications use these private symbols. In addition to that,

GLib+ 2.6 makes several symbols private which were not in any installed

header files and were never intended to be exported.

* To reduce code size and improve efficiency, GLib, when compiled

with the GNU toolchain, has separate internal and external entry

points for exported functions. The internal names, which begin with

IA__, may be seen when debugging a GLib program.

* On Windows, GLib no longer opens a console window when printing

warning messages if stdout or stderr are invalid, as they are in

"Windows subsystem" (GUI) applications. Simply redirect stdout or

stderr if you need to see them.

* The child watch functionality tends to reveal a bug in many

 thread implementations (in particular the older LinuxThreads

 implementation on Linux) where it's not possible to call waitpid()

 for a child created in a different thread. For this reason, for

 maximum portability, you should structure your code to fork all

 child processes that you want to wait for from the main thread.


* A problem was recently discovered with g_signal_connect_object();

 it doesn't actually disconnect the signal handler once the object being

 connected to dies, just disables it. See the API docs for the function

 for further details and the correct workaround that will continue to

 work with future versions of GLib.


How to report bugs

==================


Bugs should be reported to the GNOME bug tracking system.

(http://bugzilla.gnome.org, product glib.) You will need

to create an account for yourself.


In the bug report please include:


* Information about your system. For instance:


 - What operating system and version

 - For Linux, what version of the C library

And anything else you think is relevant.

* How to reproduce the bug.

If you can reproduce it with one of the test programs that are built

in the tests/ subdirectory, that will be most convenient. Otherwise,

please include a short test program that exhibits the behavior.

As a last resort, you can also provide a pointer to a larger piece

of software that can be downloaded.

* If the bug was a crash, the exact text that was printed out

 when the crash occured.

* Further information such as stack traces may be useful, but

 is not necessary.

Patches

=======

Patches should also be submitted to bugzilla.gnome.org. If the

patch fixes an existing bug, add the patch as an attachment

to that bug report.

Otherwise, enter a new bug report that describes the patch,

and attach the patch to that bug report.

 Patches should be in unified diff form. (The -up option to GNUdiff.)

--------------------------------------------------------------------------------------------------------------------------

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### Gzip (v1.5):

This is the file README for the gzip distribution.


The GNU gzip home page is http://www.gnu.org/software/gzip.


gzip (GNU zip) is a compression utility designed to be a replacement

for 'compress'. Its main advantages over compress are much better

compression and freedom from patented algorithms. The GNU Project

uses it as the standard compression program for its system.


gzip currently uses by default the LZ77 algorithm used in zip 1.9 (the

portable pkzip compatible archiver). The gzip format was however

designed to accommodate several compression algorithms. See below

for a comparison of zip and gzip.


gunzip can currently decompress files created by gzip, compress or

pack. The detection of the input format is automatic. For the

gzip format, gunzip checks a 32 bit CRC. For pack, gunzip checks the

uncompressed length. The 'compress' format was not designed to allow

consistency checks. However gunzip is sometimes able to detect a bad

.Z file because there is some redundancy in the .Z compression format.

If you get an error when uncompressing a .Z file, do not assume that

the .Z file is correct simply because the standard uncompress does not

complain. This generally means that the standard uncompress does not

check its input, and happily generates garbage output.

gzip produces files with a .gz extension. Previous versions of gzip

used the .z extension, which was already used by the 'pack'

Huffman encoder. gunzip is able to decompress .z files (packed

or gzip'ed).


Several planned features are not yet supported (see the file TODO).

See the file NEWS for a summary of changes since the last release.

See the file INSTALL for installation instructions.


WARNING: gzip is sensitive to compiler bugs, particularly when

optimizing. Use "make check" to check that gzip was compiled

correctly. Try compiling gzip without any optimization if you have a

problem.


Please send all comments and bug reports by electronic mail to

<bug-gzip@gnu.org>.


Bug reports should ideally include:


  * The complete output of "gzip -V" (or the contents of revision.h

   if you can't get gzip to compile)

  * The hardware and operating system (try "uname -a")

  * The compiler used to compile (if it is gcc, use "gcc -v")

  * A description of the bug behavior

  * The input to gzip, that triggered the bug

If you send me patches for machines I don't have access to, please test them

very carefully. gzip is used for backups, it must be extremely reliable.

The znew and gzexe shell scripts provided with gzip benefit from

(but do not require) the (non-GNU) cpmod utility to transfer file attributes.

The sample programs zread.c, sub.c and add.c in subdirectory sample

are provided as examples of useful complements to gzip. Read the

comments inside each source file. The perl script ztouch is also

provided as example (not installed by default since it relies on perl).

gzip is free software, you can redistribute it and/or modify it under

the terms of the GNU General Public License, a copy of which is

provided under the name COPYING. The latest version of gzip are always

available from ftp://ftp.gnu.org/gnu/gzip or in any of the gnu

mirror sites.

- sources in gzip-*.tar (or .shar or .tar.gz).

- MSDOS lha self-extracting exe in gzip-msdos-*.exe. Once extracted,

 copy gzip.exe to gunzip.exe and zcat.exe, or use "gzip -d" to decompress.

 gzip386.exe runs much faster but only on 386 and above; it was compiled with

 djgpp 1.10 available in directory omnigate.clarkson.edu:/pub/msdos/djgpp.

A VMS executable is in ftp://ftp.spc.edu/[.macro32.savesets]gzip-1-*.zip

(use [.macro32]unzip.exe to extract). A PRIMOS executable is available

in ftp://ftp.lysator.liu.se/pub/primos/run/gzip.run.

Some ftp servers can automatically make a tar.Z from a tar file. If

you are getting gzip for the first time, you can ask for a tar.Z file

instead of the much larger tar file.


Many thanks to those who provided me with bug reports and feedback.

See the files THANKS and ChangeLog for more details.


Note about zip vs. gzip:


The name 'gzip' was a very unfortunate choice, because zip and gzip

are two really different programs, although the actual compression and

decompression sources were written by the same persons. A different

name should have been used for gzip, but it is too late to change now.


zip is an archiver: it compresses several files into a single archive

file. gzip is a simple compressor: each file is compressed separately.

Both share the same compression and decompression code for the

'deflate' method. unzip can also decompress old zip archives

(implode, shrink and reduce methods). gunzip can also decompress files

created by compress and pack. zip 1.9 and gzip do not support

compression methods other than deflation. (zip 1.0 supports shrink and

implode). Better compression methods may be added in future versions

of gzip. zip will always stick to absolute compatibility with pkzip,

it is thus constrained by PKWare, which is a commercial company. The

gzip header format is deliberately different from that of pkzip to

avoid such a constraint.

On Unix, gzip is mostly useful in combination with tar. GNU tar

1.11.2 and later has a -z option to invoke gzip automatically. "tar -z"

compresses better than zip, since gzip can then take advantage of

redundancy between distinct files. The drawback is that you must

scan the whole tar.gz file in order to extract a single file near

the end; unzip can directly seek to the end of the zip file. There

is no overhead when you extract the whole archive anyway.

If a member of a .zip archive is damaged, other files can still

be recovered. If a .tar.gz file is damaged, files beyond the failure

point cannot be recovered. (Future versions of gzip will have

error recovery features.)


gzip and gunzip are distributed as a single program. zip and unzip

are, for historical reasons, two separate programs, although the

authors of these two programs work closely together in the Info-ZIP

team. zip and unzip are not associated with the GNU project.

See http://info-zip.org/ for more about zip and unzip.


For any copyright year range specified as YYYY-ZZZZ in this package

note that the range specifies every single year in that closed interval.


================================================================================

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## Kmod (v8):

kmod - Linux kernel module handling


OVERVIEW

========


kmod is a set of tools to handle common tasks with Linux kernel modules like

insert, remove, list, check properties, resolve dependencies and aliases.


These tools are designed on top of libkmod, a library that is shipped with

kmod. See libkmod/README for more details on this library and how to use it.

The aim is to be compatible with tools, configurations and indexes from

module-init-tools project.

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Compilation and installation

=============================

In order to compiler the source code you need following software packages:

- GCC compiler

- GNU C library

Optional dependencies:

- ZLIB library

- LZMA library

Typical configuration:

./configure CFLAGS="-g -O2" --prefix=/usr \

        --sysconfdir=/etc --libdir=/usr/lib

Configure automatically searches for all required components and packages.

To compile and install run:

    make && make install

Hacking

=======

Run 'bootstrap' script before configure. If you want to accept the recommended

flags, you just need to run 'bootstrap-configure'.

Make sure to read the CODING-STYLE file and the other READMEs: libkmod/README

and testsuite/README.


Information

===========


Signed packages:

   http://www.kernel.org/pub/linux/utils/kernel/kmod/


Mailing list:

   linux-modules@vger.kernel.org


Git:

   git://git.kernel.org/pub/scm/utils/kernel/kmod/kmod.git

   http://git.kernel.org/pub/scm/utils/kernel/kmod/kmod.git

   https://git.kernel.org/pub/scm/utils/kernel/kmod/kmod.git


Gitweb:

   http://git.kernel.org/?p=utils/kernel/kmod/kmod.git


Irc:

   #kmod on irc.freenode.org

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## Libffi (3.0.11):

Status

======

libffi-3.0.11 was released on April 11, 2012. Check the libffi web

page for updates: <URL:http://sourceware.org/libffi/>.

What is libffi?

===============

Compilers for high level languages generate code that follow certain

conventions. These conventions are necessary, in part, for separate

compilation to work. One such convention is the "calling

convention". The "calling convention" is essentially a set of

assumptions made by the compiler about where function arguments will

be found on entry to a function. A "calling convention" also specifies

where the return value for a function is found.

Some programs may not know at the time of compilation what arguments

are to be passed to a function. For instance, an interpreter may be

told at run-time about the number and types of arguments used to call

a given function. Libffi can be used in such programs to provide a

bridge from the interpreter program to compiled code.

The libffi library provides a portable, high level programming

interface to various calling conventions. This allows a programmer to

call any function specified by a call interface description at run

time.

FFI stands for Foreign Function Interface. A foreign function

interface is the popular name for the interface that allows code

written in one language to call code written in another language. The

libffi library really only provides the lowest, machine dependent

layer of a fully featured foreign function interface. A layer must

exist above libffi that handles type conversions for values passed

between the two languages.

Supported Platforms

===================

Libffi has been ported to many different platforms.

For specific configuration details and testing status, please

refer to the wiki page here:

http://www.moxielogic.org/wiki/index.php?title=Libffi_3.0.11

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At the time of release, the following basic configurations have been

tested:


|--------------+-----------------|

| Architecture | Operating System |

|--------------+-----------------|

| Alpha     | Linux     |

| Alpha     | Tru64     |

| ARM     | Linux     |

| ARM     | iOS     |

| AVR32     | Linux     |

| HPPA     | HPUX     |

| IA-64     | Linux     |

| M68K     | FreeMiNT     |

| M68K     | RTEMS     |

| MIPS     | IRIX     |

| MIPS     | Linux     |

| MIPS     | RTEMS     |

| MIPS64     | Linux     |

| PowerPC   | AMIGA     |

| PowerPC   | Linux     |

| PowerPC   | Mac OSX     |

| PowerPC   | FreeBSD     |

| PowerPC64  | Linux     |

| S390     | Linux     |

| S390X     | Linux     |

| SPARC     | Linux     |

```
| SPARC    | Solaris    |

| SPARC64  | Linux      |

| SPARC64  | FreeBSD    |

| X86      | FreeBSD    |

| X86      | Interix    |

| X86      | kFreeBSD   |

| X86      | Linux      |

| X86      | Mac OSX    |

| X86      | OpenBSD    |

| X86      | OS/2       |

| X86      | Solaris    |

| X86      | Windows/Cygwin  |

| X86      | Windows/MingW   |

| X86-64   | FreeBSD    |

| X86-64   | Linux      |

| X86-64   | Linux/x32  |

| X86-64   | OpenBSD    |

| X86-64   | Windows/MingW  |

|-------------+-----------------|
```

Please send additional platform test results to

libffi-discuss@sourceware.org and feel free to update the wiki page

above.

Installing libffi

==================


First you must configure the distribution for your particular

system. Go to the directory you wish to build libffi in and run the

"configure" program found in the root directory of the libffi source

distribution.


You may want to tell configure where to install the libffi library and

header files. To do that, use the --prefix configure switch. Libffi

will install under /usr/local by default.


If you want to enable extra run-time debugging checks use the the

--enable-debug configure switch. This is useful when your program dies

mysteriously while using libffi.


Another useful configure switch is --enable-purify-safety. Using this

will add some extra code which will suppress certain warnings when you

are using Purify with libffi. Only use this switch when using

Purify, as it will slow down the library.


It's also possible to build libffi on Windows platforms with

Microsoft's Visual C++ compiler. In this case, use the msvcc.sh

wrapper script during configuration like so:


path/to/configure CC=path/to/msvcc.sh LD=link CPP=\"cl -nologo -EP\"

For 64-bit Windows builds, use CC="path/to/msvcc.sh -m64".

You may also need to specify --build appropriately. When building with MSVC

under a MingW environment, you may need to remove the line in configure

that sets 'fix_srcfile_path' to a 'cygpath' command. ('cygpath' is not

present in MingW, and is not required when using MingW-style paths.)


For iOS builds, run generate-ios-source-and-headers.py and then

libffi.xcodeproj should work.


Configure has many other options. Use "configure --help" to see them all.


Once configure has finished, type "make". Note that you must be using

GNU make. You can ftp GNU make from prep.ai.mit.edu:/pub/gnu.


To ensure that libffi is working as advertised, type "make check".

This will require that you have DejaGNU installed.


To install the library and header files, type "make install".

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History

=======

See the ChangeLog files for details.

3.0.11 Apr-11-12

   Add support for variadic functions (ffi_prep_cif_var).

   Add Linux/x32 support.

   Add thiscall, fastcall and MSVC cdecl support on Windows.

   Add Amiga and newer MacOS support.

   Add m68k FreeMiNT support.

   Integration with iOS' xcode build tools.

   Fix Octeon and MC68881 support.

   Fix code pessimizations.

   Lots of build fixes.

3.0.10 Aug-23-11

   Add support for Apple's iOS.

   Add support for ARM VFP ABI.

   Add RTEMS support for MIPS and M68K.

   Fix instruction cache clearing problems on

    ARM and SPARC.

   Fix the N64 build on mips-sgi-irix6.5.

   Enable builds with Microsoft's compiler.

   Enable x86 builds with Oracle's Solaris compiler.

   Fix support for calling code compiled with Oracle's Sparc

    Solaris compiler.

Testsuite fixes for Tru64 Unix.

Additional platform support.

3.0.9 Dec-31-09

Add AVR32 and win64 ports. Add ARM softfp support.

Many fixes for AIX, Solaris, HP-UX, *BSD.

Several PowerPC and x86-64 bug fixes.

Build DLL for windows.

3.0.8 Dec-19-08

Add *BSD, BeOS, and PA-Linux support.

3.0.7 Nov-11-08

Fix for ppc FreeBSD.

(thanks to Andreas Tobler)

3.0.6 Jul-17-08

Fix for closures on sh.

Mark the sh/sh64 stack as non-executable.

(both thanks to Kaz Kojima)

3.0.5 Apr-3-08

Fix libffi.pc file.

Fix #define ARM for IcedTea users.

Fix x86 closure bug.

3.0.4 Feb-24-08

   Fix x86 OpenBSD configury.

3.0.3 Feb-22-08

   Enable x86 OpenBSD thanks to Thomas Heller, and

   x86-64 FreeBSD thanks to Björn König and Andreas Tobler.

   Clean up test instruction in README.

3.0.2 Feb-21-08

   Improved x86 FreeBSD support.

   Thanks to Björn König.

3.0.1 Feb-15-08

   Fix instruction cache flushing bug on MIPS.

   Thanks to David Daney.

3.0.0 Feb-15-08

   Many changes, mostly thanks to the GCC project.

   Cygnus Solutions is now Red Hat.

 [10 years go by...]

1.20 Oct-5-98

   Raffaele Sena produces ARM port.

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1.19 Oct-5-98

Fixed x86 long double and long long return support.

m68k bug fixes from Andreas Schwab.

Patch for DU assembler compatibility for the Alpha from Richard

Henderson.

1.18 Apr-17-98

Bug fixes and MIPS configuration changes.

1.17 Feb-24-98

Bug fixes and m68k port from Andreas Schwab. PowerPC port from

Geoffrey Keating. Various bug x86, Sparc and MIPS bug fixes.

1.16 Feb-11-98

Richard Henderson produces Alpha port.

1.15 Dec-4-97

Fixed an n32 ABI bug. New libtool, auto* support.

1.14 May-13-97

libtool is now used to generate shared and static libraries.

Fixed a minor portability problem reported by Russ McManus

<mcmanr@eq.gs.com>.

1.13 Dec-2-96

Added --enable-purify-safety to keep Purify from complaining

about certain low level code.

Sparc fix for calling functions with < 6 args.

Linux x86 a.out fix.


1.12 Nov-22-96

Added missing ffi_type_void, needed for supporting void return

types. Fixed test case for non MIPS machines. Cygnus Support

is now Cygnus Solutions.


1.11 Oct-30-96

Added notes about GNU make.


1.10 Oct-29-96

Added configuration fix for non GNU compilers.


1.09 Oct-29-96

Added --enable-debug configure switch. Clean-ups based on LCLint

feedback. ffi_mips.h is always installed. Many configuration

fixes. Fixed ffitest.c for sparc builds.


1.08 Oct-15-96

Fixed n32 problem. Many clean-ups.

1.07 Oct-14-96

    Gordon Irlam rewrites v8.S again. Bug fixes.

1.06 Oct-14-96

    Gordon Irlam improved the sparc port.

1.05 Oct-14-96

    Interface changes based on feedback.

1.04 Oct-11-96

    Sparc port complete (modulo struct passing bug).

1.03 Oct-10-96

    Passing struct args, and returning struct values works for

    all architectures/calling conventions. Expanded tests.

1.02 Oct-9-96

    Added SGI n32 support. Fixed bugs in both o32 and Linux support.

    Added "make test".

1.01 Oct-8-96

    Fixed float passing bug in mips version. Restructured some

    of the code. Builds cleanly with SGI tools.

1.00 Oct-7-96

    First release. No public announcement.

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Authors & Credits

==================

libffi was originally written by Anthony Green <green@moxielogic.com>.

The developers of the GNU Compiler Collection project have made

innumerable valuable contributions. See the ChangeLog file for

details.

Some of the ideas behind libffi were inspired by Gianni Mariani's free

gencall library for Silicon Graphics machines.

The closure mechanism was designed and implemented by Kresten Krab

Thorup.

Major processor architecture ports were contributed by the following

developers:

alpha       Richard Henderson

arm       Raffaele Sena

cris       Simon Posnjak, Hans-Peter Nilsson

frv       Anthony Green

ia64       Hans Boehm

m32r       Kazuhiro Inaoka

m68k       Andreas Schwab

mips       Anthony Green, Casey Marshall

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mips64      David Daney

pa      Randolph Chung, Dave Anglin, Andreas Tobler

powerpc         Geoffrey Keating, Andreas Tobler,

              David Edelsohn, John Hornkvist

powerpc64    Jakub Jelinek

s390      Gerhard Tonn, Ulrich Weigand

sh      Kaz Kojima

sh64      Kaz Kojima

sparc      Anthony Green, Gordon Irlam

x86      Anthony Green, Jon Beniston

x86-64      Bo Thorsen


Jesper Skov and Andrew Haley both did more than their fair share of

stepping through the code and tracking down bugs.


Thanks also to Tom Tromey for bug fixes, documentation and

configuration help.


Thanks to Jim Blandy, who provided some useful feedback on the libffi

interface.


Andreas Tobler has done a tremendous amount of work on the testsuite.


Alex Oliva solved the executable page problem for SElinux.


The list above is almost certainly incomplete and inaccurate. I'm

happy to make corrections or additions upon request.

If you have a problem, or have found a bug, please send a note to the

author at green@moxielogic.com, or the project mailing list at

libffi-discuss@sourceware.org.

---

## Libjpeg (v9a):

The Independent JPEG Group's JPEG software

==========================================

README for release 8d of 15-Jan-2012

====================================

This distribution contains the eighth public release of the Independent JPEG

Group's free JPEG software. You are welcome to redistribute this software and

to use it for any purpose, subject to the conditions under LEGAL ISSUES, below.

This software is the work of Tom Lane, Guido Vollbeding, Philip Gladstone,

Bill Allombert, Jim Boucher, Lee Crocker, Bob Friesenhahn, Ben Jackson,

Julian Minguillon, Luis Ortiz, George Phillips, Davide Rossi, Ge' Weijers,

and other members of the Independent JPEG Group.

IJG is not affiliated with the ISO/IEC JTC1/SC29/WG1 standards committee

(also known as JPEG, together with ITU-T SG16).

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DOCUMENTATION ROADMAP

=====================

This file contains the following sections:


OVERVIEW        General description of JPEG and the IJG software.

LEGAL ISSUES    Copyright, lack of warranty, terms of distribution.

REFERENCES      Where to learn more about JPEG.

ARCHIVE LOCATIONS  Where to find newer versions of this software.

ACKNOWLEDGMENTS    Special thanks.

FILE FORMAT WARS  Software *not* to get.

TO DO        Plans for future IJG releases.


Other documentation files in the distribution are:


User documentation:

 install.txt    How to configure and install the IJG software.

 usage.txt     Usage instructions for cjpeg, djpeg, jpegtran,

      rdjpgcom, and wrjpgcom.

 *.1       Unix-style man pages for programs (same info as usage.txt).

 wizard.txt    Advanced usage instructions for JPEG wizards only.

 change.log    Version-to-version change highlights.

Programmer and internal documentation:

 libjpeg.txt    How to use the JPEG library in your own programs.

 example.c     Sample code for calling the JPEG library.

 structure.txt   Overview of the JPEG library's internal structure.

 filelist.txt   Road map of IJG files.

 coderules.txt   Coding style rules --- please read if you contribute code.

Please read at least the files install.txt and usage.txt. Some information

can also be found in the JPEG FAQ (Frequently Asked Questions) article. See

ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or

more of the REFERENCES, then looking at the documentation files (in roughly

the order listed) before diving into the code.

OVERVIEW

========

This package contains C software to implement JPEG image encoding, decoding,

and transcoding. JPEG (pronounced "jay-peg") is a standardized compression

method for full-color and gray-scale images.

This software implements JPEG baseline, extended-sequential, and progressive

compression processes. Provision is made for supporting all variants of these

processes, although some uncommon parameter settings aren't implemented yet.

We have made no provision for supporting the hierarchical or lossless

processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files,

plus two sample applications "cjpeg" and "djpeg", which use the library to

perform conversion between JPEG and some other popular image file formats.

The library is intended to be reused in other applications.

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In order to support file conversion and viewing software, we have included

considerable functionality beyond the bare JPEG coding/decoding capability;

for example, the color quantization modules are not strictly part of JPEG

decoding, but they are essential for output to colormapped file formats or

colormapped displays. These extra functions can be compiled out of the

library if not required for a particular application.


We have also included "jpegtran", a utility for lossless transcoding between

different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple

applications for inserting and extracting textual comments in JFIF files.


The emphasis in designing this software has been on achieving portability and

flexibility, while also making it fast enough to be useful. In particular,

the software is not intended to be read as a tutorial on JPEG. (See the

REFERENCES section for introductory material.) Rather, it is intended to

be reliable, portable, industrial-strength code. We do not claim to have

achieved that goal in every aspect of the software, but we strive for it.


We welcome the use of this software as a component of commercial products.

No royalty is required, but we do ask for an acknowledgement in product

documentation, as described under LEGAL ISSUES.

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LEGAL ISSUES

============

In plain English:

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   please let us know!)

2. You can use this software for whatever you want. You don't have to pay us.

3. You may not pretend that you wrote this software. If you use it in a

   program, you must acknowledge somewhere in your documentation that

   you've used the IJG code.

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must be clearly indicated in accompanying documentation.

(2) If only executable code is distributed, then the accompanying

documentation must state that "this software is based in part on the work of

the Independent JPEG Group".

(3) Permission for use of this software is granted only if the user accepts

full responsibility for any undesirable consequences; the authors accept

NO LIABILITY for damages of any kind.


These conditions apply to any software derived from or based on the IJG code,

not just to the unmodified library. If you use our work, you ought to

acknowledge us.


Permission is NOT granted for the use of any IJG author's name or company name

in advertising or publicity relating to this software or products derived from

it. This software may be referred to only as "the Independent JPEG Group's

software".


We specifically permit and encourage the use of this software as the basis of

commercial products, provided that all warranty or liability claims are

assumed by the product vendor.



ansi2knr.c is included in this distribution by permission of L. Peter Deutsch,

sole proprietor of its copyright holder, Aladdin Enterprises of Menlo Park, CA.

ansi2knr.c is NOT covered by the above copyright and conditions, but instead

by the usual distribution terms of the Free Software Foundation; principally,

that you must include source code if you redistribute it. (See the file

ansi2knr.c for full details.) However, since ansi2knr.c is not needed as part

of any program generated from the IJG code, this does not limit you more than

the foregoing paragraphs do.

The Unix configuration script "configure" was produced with GNU Autoconf.

It is copyright by the Free Software Foundation but is freely distributable.

The same holds for its supporting scripts (config.guess, config.sub,

ltmain.sh). Another support script, install-sh, is copyright by X Consortium

but is also freely distributable.

The IJG distribution formerly included code to read and write GIF files.

To avoid entanglement with the Unisys LZW patent, GIF reading support has

been removed altogether, and the GIF writer has been simplified to produce

"uncompressed GIFs". This technique does not use the LZW algorithm; the

resulting GIF files are larger than usual, but are readable by all standard

GIF decoders.

We are required to state that

  "The Graphics Interchange Format(c) is the Copyright property of

  CompuServe Incorporated. GIF(sm) is a Service Mark property of

  CompuServe Incorporated."

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REFERENCES

==========

We recommend reading one or more of these references before trying to

understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is

    Wallace, Gregory K. "The JPEG Still Picture Compression Standard",

    Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44.

(Adjacent articles in that issue discuss MPEG motion picture compression,

applications of JPEG, and related topics.) If you don't have the CACM issue

handy, a PostScript file containing a revised version of Wallace's article is

available at http://www.ijg.org/files/wallace.ps.gz. The file (actually

a preprint for an article that appeared in IEEE Trans. Consumer Electronics)

omits the sample images that appeared in CACM, but it includes corrections

and some added material. Note: the Wallace article is copyright ACM and IEEE,

and it may not be used for commercial purposes.

A somewhat less technical, more leisurely introduction to JPEG can be found in

"The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by

M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides

good explanations and example C code for a multitude of compression methods

including JPEG. It is an excellent source if you are comfortable reading C

code but don't know much about data compression in general. The book's JPEG

sample code is far from industrial-strength, but when you are ready to look

at a full implementation, you've got one here...

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The best currently available description of JPEG is the textbook "JPEG Still
Image Data Compression Standard" by William B. Pennebaker and Joan L.
Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1.
Price US$59.95, 638 pp. The book includes the complete text of the ISO JPEG
standards (DIS 10918-1 and draft DIS 10918-2).

Although this is by far the most detailed and comprehensive exposition of
JPEG publicly available, we point out that it is still missing an explanation
of the most essential properties and algorithms of the underlying DCT
technology.

If you think that you know about DCT-based JPEG after reading this book,
then you are in delusion. The real fundamentals and corresponding potential
of DCT-based JPEG are not publicly known so far, and that is the reason for
all the mistaken developments taking place in the image coding domain.


The original JPEG standard is divided into two parts, Part 1 being the actual
specification, while Part 2 covers compliance testing methods. Part 1 is
titled "Digital Compression and Coding of Continuous-tone Still Images,
Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS
10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of
Continuous-tone Still Images, Part 2: Compliance testing" and has document
numbers ISO/IEC IS 10918-2, ITU-T T.83.

IJG JPEG 8 introduces an implementation of the JPEG SmartScale extension
which is specified in two documents: A contributed document at ITU and ISO
with title "ITU-T JPEG-Plus Proposal for Extending ITU-T T.81 for Advanced
Image Coding", April 2006, Geneva, Switzerland. The latest version of this
document is Revision 3. And a contributed document ISO/IEC JTC1/SC29/WG1 N
5799 with title "Evolution of JPEG", June/July 2011, Berlin, Germany.

The JPEG standard does not specify all details of an interchangeable file

format. For the omitted details we follow the "JFIF" conventions, revision

1.02. JFIF 1.02 has been adopted as an Ecma International Technical Report

and thus received a formal publication status. It is available as a free

download in PDF format from

http://www.ecma-international.org/publications/techreports/E-TR-098.htm.

A PostScript version of the JFIF document is available at

http://www.ijg.org/files/jfif.ps.gz. There is also a plain text version at

http://www.ijg.org/files/jfif.txt.gz, but it is missing the figures.


The TIFF 6.0 file format specification can be obtained by FTP from

ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz. The JPEG incorporation scheme

found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems.

IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6).

Instead, we recommend the JPEG design proposed by TIFF Technical Note #2

(Compression tag 7). Copies of this Note can be obtained from

http://www.ijg.org/files/. It is expected that the next revision

of the TIFF spec will replace the 6.0 JPEG design with the Note's design.

Although IJG's own code does not support TIFF/JPEG, the free libtiff library

uses our library to implement TIFF/JPEG per the Note.

ARCHIVE LOCATIONS

==================

The "official" archive site for this software is www.ijg.org.

The most recent released version can always be found there in

directory "files". This particular version will be archived as

http://www.ijg.org/files/jpegsrc.v8d.tar.gz, and in Windows-compatible

"zip" archive format as http://www.ijg.org/files/jpegsr8d.zip.


The JPEG FAQ (Frequently Asked Questions) article is a source of some

general information about JPEG.

It is available on the World Wide Web at http://www.faqs.org/faqs/jpeg-faq/

and other news.answers archive sites, including the official news.answers

archive at rtfm.mit.edu: ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/.

If you don't have Web or FTP access, send e-mail to mail-server@rtfm.mit.edu

with body

    send usenet/news.answers/jpeg-faq/part1

    send usenet/news.answers/jpeg-faq/part2

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ACKNOWLEDGMENTS

===============

Thank to Juergen Bruder for providing me with a copy of the common DCT

algorithm article, only to find out that I had come to the same result

in a more direct and comprehensible way with a more generative approach.

Thank to Istvan Sebestyen and Joan L. Mitchell for inviting me to the

ITU JPEG (Study Group 16) meeting in Geneva, Switzerland.

Thank to Thomas Wiegand and Gary Sullivan for inviting me to the

Joint Video Team (MPEG & ITU) meeting in Geneva, Switzerland.

Thank to Thomas Richter and Daniel Lee for inviting me to the

ISO/IEC JTC1/SC29/WG1 (also known as JPEG, together with ITU-T SG16)

meeting in Berlin, Germany.

Thank to John Korejwa and Massimo Ballerini for inviting me to

fruitful consultations in Boston, MA and Milan, Italy.

Thank to Hendrik Elstner, Roland Fassauer, Simone Zuck, Guenther

Maier-Gerber, Walter Stoeber, Fred Schmitz, and Norbert Braunagel

for corresponding business development.

Thank to Nico Zschach and Dirk Stelling of the technical support team

at the Digital Images company in Halle for providing me with extra

equipment for configuration tests.

Thank to Richard F. Lyon (then of Foveon Inc.) for fruitful

communication about JPEG configuration in Sigma Photo Pro software.

Thank to Andrew Finkenstadt for hosting the ijg.org site.

Last but not least special thank to Thomas G. Lane for the original

design and development of this singular software package.

FILE FORMAT WARS

================

The ISO/IEC JTC1/SC29/WG1 standards committee (also known as JPEG, together

with ITU-T SG16) currently promotes different formats containing the name

"JPEG" which is misleading because these formats are incompatible with

original DCT-based JPEG and are based on faulty technologies.

IJG therefore does not and will not support such momentary mistakes

(see REFERENCES).

There exist also distributions under the name "OpenJPEG" promoting such

kind of formats which is misleading because they don't support original

JPEG images.

We have no sympathy for the promotion of inferior formats. Indeed, one of

the original reasons for developing this free software was to help force

convergence on common, interoperable format standards for JPEG files.

Don't use an incompatible file format!

(In any case, our decoder will remain capable of reading existing JPEG

image files indefinitely.)

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Furthermore, the ISO committee pretends to be "responsible for the popular

JPEG" in their public reports which is not true because they don't respond to

actual requirements for the maintenance of the original JPEG specification.

There are currently distributions in circulation containing the name

"libjpeg" which claim to be a "derivative" or "fork" of the original

libjpeg, but don't have the features and are incompatible with formats

supported by actual IJG libjpeg distributions. Furthermore, they

violate the license conditions as described under LEGAL ISSUES above.

We have no sympathy for the release of misleading and illegal

distributions derived from obsolete code bases.

Don't use an obsolete code base!

TO DO

=====

Version 8 is the first release of a new generation JPEG standard

to overcome the limitations of the original JPEG specification.

More features are being prepared for coming releases...

Please send bug reports, offers of help, etc. to jpeg-info@jpegclub.org.

--------------------------------------------------------------------------------------------------------------------

## Libkmod (v8):

libkmod - linux kernel module handling library

ABSTRACT

========

libkmod was created to allow programs to easily insert, remove and

list modules, also checking its properties, dependencies and aliases.

there is no shared/global context information and it can be used by

multiple sites on a single program, also being able to be used from

threads, although it's not thread safe (you must lock explicitly).

OVERVIEW

========

Every user should create and manage it's own library context with:

```
struct kmod_ctx *ctx = kmod_new(kernel_dirname);

kmod_unref(ctx);
```

Modules can be created with by various means:

```
struct kmod_module *mod;

int err;


err = kmod_module_new_from_path(ctx, path, &mod);

if (err < 0) {

 /* code */

} else {

 /* code */

 kmod_module_unref(mod);

}


err = kmod_module_new_from_name(ctx, name, &mod);

if (err < 0) {

 /* code */

} else {

 /* code */

 kmod_module_unref(mod);

}
```

Or could be resolved from a known alias to a list of alternatives:

```
struct kmod_list *list, *itr;

int err;

err = kmod_module_new_from_lookup(ctx, alias, &list);
```

```
if (err < 0) {

 /* code */

} else {

 kmod_list_foreach(itr, list) {

  struct kmod_module *mod = kmod_module_get_module(itr);

  /* code */

 }

}
```

-------------------------------------------------------------------------------------------------------

## Libxml2 (v2.7.8):

Except where otherwise noted in the source code (e.g. the files hash.c, list.c and the trio files, which are covered by a similar licence but with different Copyright notices) all the files are:

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### LibPcap (v1.2.1):

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-------------------------------------------------------------------------------------------------------------------------

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### Linux (v3.2.26):

Linux kernel release 3.x <http://kernel.org/>

These are the release notes for Linux version 3. Read them carefully,

as they tell you what this is all about, explain how to install the

kernel, and what to do if something goes wrong.

WHAT IS LINUX?

Linux is a clone of the operating system Unix, written from scratch by

Linus Torvalds with assistance from a loosely-knit team of hackers across

the Net. It aims towards POSIX and Single UNIX Specification compliance.

It has all the features you would expect in a modern fully-fledged Unix,

including true multitasking, virtual memory, shared libraries, demand

loading, shared copy-on-write executables, proper memory management,

and multistack networking including IPv4 and IPv6.

It is distributed under the GNU General Public License - see the

accompanying COPYING file for more details.

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ON WHAT HARDWARE DOES IT RUN?


Although originally developed first for 32-bit x86-based PCs (386 or higher),

today Linux also runs on (at least) the Compaq Alpha AXP, Sun SPARC and

UltraSPARC, Motorola 68000, PowerPC, PowerPC64, ARM, Hitachi SuperH, Cell,

IBM S/390, MIPS, HP PA-RISC, Intel IA-64, DEC VAX, AMD x86-64, AXIS CRIS,

Xtensa, Tilera TILE, AVR32 and Renesas M32R architectures.


Linux is easily portable to most general-purpose 32- or 64-bit architectures

as long as they have a paged memory management unit (PMMU) and a port of the

GNU C compiler (gcc) (part of The GNU Compiler Collection, GCC). Linux has

also been ported to a number of architectures without a PMMU, although

functionality is then obviously somewhat limited.

Linux has also been ported to itself. You can now run the kernel as a

userspace application - this is called UserMode Linux (UML).


DOCUMENTATION:


- There is a lot of documentation available both in electronic form on

 the Internet and in books, both Linux-specific and pertaining to

 general UNIX questions. I'd recommend looking into the documentation

 subdirectories on any Linux FTP site for the LDP (Linux Documentation

 Project) books. This README is not meant to be documentation on the

 system: there are much better sources available.


- There are various README files in the Documentation/ subdirectory:

 these typically contain kernel-specific installation notes for some

drivers for example. See Documentation/00-INDEX for a list of what

is contained in each file. Please read the Changes file, as it

contains information about the problems, which may result by upgrading

your kernel.

- The Documentation/DocBook/ subdirectory contains several guides for

kernel developers and users. These guides can be rendered in a

number of formats: PostScript (.ps), PDF, HTML, & man-pages, among others.

After installation, "make psdocs", "make pdfdocs", "make htmldocs",

or "make mandocs" will render the documentation in the requested format.

INSTALLING the kernel source:

- If you install the full sources, put the kernel tarball in a

directory where you have permissions (eg. your home directory) and

unpack it:

        gzip -cd linux-3.X.tar.gz | tar xvf -

or

        bzip2 -dc linux-3.X.tar.bz2 | tar xvf -

Replace "XX" with the version number of the latest kernel.

Do NOT use the /usr/src/linux area! This area has a (usually

incomplete) set of kernel headers that are used by the library header

files. They should match the library, and not get messed up by

whatever the kernel-du-jour happens to be.


- You can also upgrade between 3.x releases by patching. Patches are

distributed in the traditional gzip and the newer bzip2 format. To

install by patching, get all the newer patch files, enter the

top level directory of the kernel source (linux-3.x) and execute:


        gzip -cd ../patch-3.x.gz | patch -p1


or

        bzip2 -dc ../patch-3.x.bz2 | patch -p1


(repeat xx for all versions bigger than the version of your current

source tree, _in_order_) and you should be ok. You may want to remove

the backup files (xxx~ or xxx.orig), and make sure that there are no

failed patches (xxx# or xxx.rej). If there are, either you or me has

made a mistake.


Unlike patches for the 3.x kernels, patches for the 3.x.y kernels

(also known as the -stable kernels) are not incremental but instead apply

directly to the base 3.x kernel. Please read

Documentation/applying-patches.txt for more information.

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Alternatively, the script patch-kernel can be used to automate this

process. It determines the current kernel version and applies any

patches found.


linux/scripts/patch-kernel linux


The first argument in the command above is the location of the

kernel source. Patches are applied from the current directory, but

an alternative directory can be specified as the second argument.


- If you are upgrading between releases using the stable series patches

(for example, patch-3.x.y), note that these "dot-releases" are

not incremental and must be applied to the 3.x base tree. For

example, if your base kernel is 3.0 and you want to apply the

3.0.3 patch, you do not and indeed must not first apply the

3.0.1 and 3.0.2 patches. Similarly, if you are running kernel

version 3.0.2 and want to jump to 3.0.3, you must first

reverse the 3.0.2 patch (that is, patch -R) _before_ applying

the 3.0.3 patch.

You can read more on this in Documentation/applying-patches.txt


- Make sure you have no stale .o files and dependencies lying around:


cd linux

make mrproper


You should now have the sources correctly installed.

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SOFTWARE REQUIREMENTS

  Compiling and running the 3.x kernels requires up-to-date

  versions of various software packages. Consult

  Documentation/Changes for the minimum version numbers required

  and how to get updates for these packages. Beware that using

  excessively old versions of these packages can cause indirect

  errors that are very difficult to track down, so don't assume that

  you can just update packages when obvious problems arise during

  build or operation.


BUILD directory for the kernel:


  When compiling the kernel all output files will per default be

  stored together with the kernel source code.

  Using the option "make O=output/dir" allow you to specify an alternate

  place for the output files (including .config).

  Example:

   kernel source code: /usr/src/linux-3.N

   build directory:        /home/name/build/kernel


  To configure and build the kernel use:

  cd /usr/src/linux-3.N

  make O=/home/name/build/kernel menuconfig

  make O=/home/name/build/kernel

  sudo make O=/home/name/build/kernel modules_install install

Please note: If the 'O=output/dir' option is used then it must be

used for all invocations of make.

CONFIGURING the kernel:

Do not skip this step even if you are only upgrading one minor

version. New configuration options are added in each release, and

odd problems will turn up if the configuration files are not set up

as expected. If you want to carry your existing configuration to a

new version with minimal work, use "make oldconfig", which will

only ask you for the answers to new questions.

 - Alternate configuration commands are:

    "make config"   Plain text interface.

    "make menuconfig" Text based color menus, radiolists & dialogs.

    "make nconfig"   Enhanced text based color menus.

    "make xconfig"   X windows (Qt) based configuration tool.

    "make gconfig"   X windows (Gtk) based configuration tool.

    "make oldconfig"  Default all questions based on the contents of

        your existing ./.config file and asking about

        new config symbols.

    "make silentoldconfig"

        Like above, but avoids cluttering the screen

        with questions already answered.

        Additionally updates the dependencies.

    "make defconfig"  Create a ./.config file by using the default

        symbol values from either arch/$ARCH/defconfig

or arch/$ARCH/configs/${PLATFORM}_defconfig,

depending on the architecture.

"make ${PLATFORM}_defconfig"

Create a ./.config file by using the default

symbol values from

arch/$ARCH/configs/${PLATFORM}_defconfig.

Use "make help" to get a list of all available

platforms of your architecture.

"make allyesconfig"

Create a ./.config file by setting symbol

values to 'y' as much as possible.

"make allmodconfig"

Create a ./.config file by setting symbol

values to 'm' as much as possible.

"make allnoconfig" Create a ./.config file by setting symbol

values to 'n' as much as possible.

"make randconfig" Create a ./.config file by setting symbol

values to random values.

You can find more information on using the Linux kernel config tools

in Documentation/kbuild/kconfig.txt.

NOTES on "make config":

- having unnecessary drivers will make the kernel bigger, and can

under some circumstances lead to problems: probing for a

nonexistent controller card may confuse your other controllers

- compiling the kernel with "Processor type" set higher than 386

will result in a kernel that does NOT work on a 386. The

kernel will detect this on bootup, and give up.

- A kernel with math-emulation compiled in will still use the

coprocessor if one is present: the math emulation will just

never get used in that case. The kernel will be slightly larger,

but will work on different machines regardless of whether they

have a math coprocessor or not.

- the "kernel hacking" configuration details usually result in a

bigger or slower kernel (or both), and can even make the kernel

less stable by configuring some routines to actively try to

break bad code to find kernel problems (kmalloc()). Thus you

should probably answer 'n' to the questions for

"development", "experimental", or "debugging" features.


COMPILING the kernel:


- Make sure you have at least gcc 3.2 available.

For more information, refer to Documentation/Changes.


Please note that you can still run a.out user programs with this kernel.


- Do a "make" to create a compressed kernel image. It is also

possible to do "make install" if you have lilo installed to suit the

kernel makefiles, but you may want to check your particular lilo setup first.


To do the actual install you have to be root, but none of the normal

build should require that. Don't take the name of root in vain.

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- If you configured any of the parts of the kernel as `modules', you

 will also have to do "make modules_install".

- Verbose kernel compile/build output:

Normally the kernel build system runs in a fairly quiet mode (but not

totally silent). However, sometimes you or other kernel developers need

to see compile, link, or other commands exactly as they are executed.

For this, use "verbose" build mode. This is done by inserting

"V=1" in the "make" command. E.g.:

   make V=1 all

To have the build system also tell the reason for the rebuild of each

target, use "V=2". The default is "V=0".

- Keep a backup kernel handy in case something goes wrong. This is

especially true for the development releases, since each new release

contains new code which has not been debugged. Make sure you keep a

backup of the modules corresponding to that kernel, as well. If you

are installing a new kernel with the same version number as your

working kernel, make a backup of your modules directory before you

do a "make modules_install".

Alternatively, before compiling, use the kernel config option

"LOCALVERSION" to append a unique suffix to the regular kernel version.

LOCALVERSION can be set in the "General Setup" menu.

- In order to boot your new kernel, you'll need to copy the kernel

  image (e.g. .../linux/arch/i386/boot/bzImage after compilation)

  to the place where your regular bootable kernel is found.


- Booting a kernel directly from a floppy without the assistance of a

  bootloader such as LILO, is no longer supported.


If you boot Linux from the hard drive, chances are you use LILO which

uses the kernel image as specified in the file /etc/lilo.conf. The

kernel image file is usually /vmlinuz, /boot/vmlinuz, /bzImage or

/boot/bzImage. To use the new kernel, save a copy of the old image

and copy the new image over the old one. Then, you MUST RERUN LILO

to update the loading map!! If you don't, you won't be able to boot

the new kernel image.


Reinstalling LILO is usually a matter of running /sbin/lilo.

You may wish to edit /etc/lilo.conf to specify an entry for your

old kernel image (say, /vmlinux.old) in case the new one does not

work. See the LILO docs for more information.


After reinstalling LILO, you should be all set. Shutdown the system,

reboot, and enjoy!

If you ever need to change the default root device, video mode,

ramdisk size, etc. in the kernel image, use the 'rdev' program (or

alternatively the LILO boot options when appropriate). No need to

recompile the kernel to change these parameters.

 - Reboot with the new kernel and enjoy.

IF SOMETHING GOES WRONG:

 - If you have problems that seem to be due to kernel bugs, please check

   the file MAINTAINERS to see if there is a particular person associated

   with the part of the kernel that you are having trouble with. If there

   isn't anyone listed there, then the second best thing is to mail

   them to me (torvalds@linux-foundation.org), and possibly to any other

   relevant mailing-list or to the newsgroup.

 - In all bug-reports, *please* tell what kernel you are talking about,

   how to duplicate the problem, and what your setup is (use your common

   sense). If the problem is new, tell me so, and if the problem is

   old, please try to tell me when you first noticed it.

 - If the bug results in a message like

     unable to handle kernel paging request at address C0000010

     Oops: 0002

     EIP:  0010:XXXXXXXX

     eax: xxxxxxxx  ebx: xxxxxxxx  ecx: xxxxxxxx  edx: xxxxxxxx

esi: xxxxxxxx  edi: xxxxxxxx  ebp: xxxxxxxx

ds: xxxx es: xxxx fs: xxxx gs: xxxx

Pid: xx, process nr: xx

xx xx xx xx xx xx xx xx xx xx


or similar kernel debugging information on your screen or in your

system log, please duplicate it *exactly*. The dump may look

incomprehensible to you, but it does contain information that may

help debugging the problem. The text above the dump is also

important: it tells something about why the kernel dumped code (in

the above example it's due to a bad kernel pointer). More information

on making sense of the dump is in Documentation/oops-tracing.txt


- If you compiled the kernel with CONFIG_KALLSYMS you can send the dump

as is, otherwise you will have to use the "ksymoops" program to make

sense of the dump (but compiling with CONFIG_KALLSYMS is usually preferred).

This utility can be downloaded from

ftp://ftp.<country>.kernel.org/pub/linux/utils/kernel/ksymoops/ .

Alternately you can do the dump lookup by hand:


- In debugging dumps like the above, it helps enormously if you can

look up what the EIP value means. The hex value as such doesn't help

me or anybody else very much: it will depend on your particular

kernel setup. What you should do is take the hex value from the EIP

line (ignore the "0010:"), and look it up in the kernel namelist to

see which kernel function contains the offending address.

To find out the kernel function name, you'll need to find the system

binary associated with the kernel that exhibited the symptom. This is

the file 'linux/vmlinux'. To extract the namelist and match it against

the EIP from the kernel crash, do:

```
nm vmlinux | sort | less
```

This will give you a list of kernel addresses sorted in ascending

order, from which it is simple to find the function that contains the

offending address. Note that the address given by the kernel

debugging messages will not necessarily match exactly with the

function addresses (in fact, that is very unlikely), so you can't

just 'grep' the list: the list will, however, give you the starting

point of each kernel function, so by looking for the function that

has a starting address lower than the one you are searching for but

is followed by a function with a higher address you will find the one

you want. In fact, it may be a good idea to include a bit of

"context" in your problem report, giving a few lines around the

interesting one.

If you for some reason cannot do the above (you have a pre-compiled

kernel image or similar), telling me as much about your setup as

possible will help. Please read the REPORTING-BUGS document for details.

- Alternately, you can use gdb on a running kernel. (read-only; i.e. you

cannot change values or set break points.) To do this, first compile the

kernel with -g; edit arch/i386/Makefile appropriately, then do a "make

clean". You'll also need to enable CONFIG_PROC_FS (via "make config").


After you've rebooted with the new kernel, do "gdb vmlinux /proc/kcore".

You can now use all the usual gdb commands. The command to look up the

point where your system crashed is "l *0xXXXXXXXX". (Replace the XXXes

with the EIP value.)


gdb'ing a non-running kernel currently fails because gdb (wrongly)

disregards the starting offset for which the kernel is compiled.

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## Lsof (v4.85):

lsof (LiSt Open Files) version 4

(revision 4.85)

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| The latest release of lsof is always available via anonymous ftp |

| from lsof.itap.purdue.edu. Look in pub/tools/unix/lsof.     |

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| CHECK THE PATCHES/ SUBDIRECTORY FOR FIXES TO THE LATEST LSOF DISTRIBUTION. |

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| AVOID USING PRE-BUILT LSOF BINARIES: SEE THE "PRE-BUILT LSOF BINARIES" |

|      SECTION IN 00README FOR AN EXPLANATION.      |

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| READ 00LSOF-L FOR INFORMATION ON THE LSOF-L LISTSERV MAILING LIST. |

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|  CHECK 00FAQ BEFORE REPORTING BUGS TO <abe@purdue.edu>.   |

| 00FAQ ALSO AT: ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/FAQ |

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```
********************************************************************

| IMPORTANT! This README file explains how the lsof tar archive  |

| is assembled -- it's a "wrapper" tar archive. Please read the  |

| explanation of its naming and construction, immediately        |

| following the initial list of supported dialects.              |

********************************************************************
```

Lsof version 4 lists open files for running UNIX processes. It is a

descendent of ofiles, fstat, and lsof versions 1, 2, and 3. It has

been tested recently on these UNIX dialects.

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AIX 5.3

Apple Darwin 9 and Mac OS X 10.[56]

FreeBSD 4.9 and 6.4 for x86-based systems

FreeBSD 8.[02] and 9.0 for AMD64-based systems

Linux 2.1.72 and above for x86-based systems

Solaris 9, 10 and 11

Lsof 4 may work on other versions of these dialects, but hasn't been

tested there recently. Lsof versions 2 and 3 are still available and

may provide older dialect version support. See the notes on them in

this file.

The pub/tools/unix/lsof/contrib directory on lsof.itap.purdue.edu also

contains information on other ports.

Version 4 of lsof is distributed as bzip2'd, gzip'd and compressed tar

archives in the files:

 ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof.tar.bz2

 and

 ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof.tar.gz

 and

 ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof.tar.Z

These files are links to the current distribution, whose name includes

the revision number:

ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof_<rev>.tar.bz2

and

ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof_<rev>.tar.gz

and

ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof_<rev>.tar.Z


<rev> is the revision number -- e.g., 4.85. These archives are called

wrappers, because the lsof source tar archive, its GPG certificate

(lsof_<rev>_src.tar.sig), and some documentation files are wrapped

together inside them. (The GPG certificate authenticates the source

tar archive.) A tar archive with: a ``.bz2'' suffix has been

compressed with bzip2; ``.gz'', with gzip; and ``.Z'', with compress.


When the wrapper tar is gunzip'd or uncompressed, and its tar archive

contents are extracted, an lsof_4.85 subdirectory is created in the

directory where the extraction was performed. The lsof_4.85

subdirectory contains these files:


    00.README.FIRST       contains introductory distribution

            information.


    README.lsof_4.85   contains instructions for the

            security-conscious on how to be

            sure that no one has tampered with

            the distribution.

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RELEASE_SUMMARY_4.85   is this file.

lsof_4.85_src.tar    is a tar archive, containing the

lsof sources. When extracted with

tar it creates a subdirectory named

lsof_4.85_src in the directory

where the extraction was performed.

The lsof source files will be found

in lsof_4.85_src.

lsof_4.85_src.tar.sig  is a GPG certificate, authenticating

the lsof_4.85_src.tar archive. See the

README.lsof_4.85 file for more

information on GPG authentication of

lsof_4.85_src.tar.

If you've obtained this file and an lsof distribution from a mirror

site, please be aware that THE LATEST VERSION OF LSOF IS AVAILABLE VIA

ANONYMOUS FTP FROM LSOF.ITAP.PURDUE.EDU IN THE PUB/TOOLS/UNIX/LSOF

DIRECTORY.

Patches to lsof distributions may be found in the patches/ sub-

directory where you found lsof.tar.bz2, lsof.tar.gz or lsof.tar.Z.

If there are any patches to the current distribution, they will be

found in the patches/4.85/ branch.

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(If you need a copy of gunzip, look for it at prep.ai.mit.edu in

pub/gnu/gzip*.)


* The September 27, 2011 revision (4.85): adds an automatic work-around for

 an lgrp_root conflict in some Solaris 9 and 10 versions; supports FreeBSD

 7.4 and 8.[12] (8.1 not tested); adds fixes for Solaris 11 kernel module

 path determination; picked lint for Linux; added more Linux cross

 configuration support; adds support for Mac OS X 10.6; tested on FreeBSD

 6.4; adapts to FreeBSD ZFS update; drops support for FreeBSD 7.x; adjusts

 for Solaris 10 with patch 144488-10; added Linux +|-e option support;

 adjusts for a FreeBSD 9 change; fixes a Linux AF_UNIX path reporting bug;

 adjusts for dropping of RPC headers from Linux GlibC 2.14; adds Linux

 Netlink protocol support; corrects UDP6-lite Linux path.



Read the 00.README.FIRST in the lsof distribution first.


Read the 00DIST distribution file for more details on feature additions

and bug fixes.


The 00README distribution file has build instructions, dialect

descriptions, special feature discussions, and installation hints.


The 00FAQ file contains a list of frequently asked questions and their

answers.


The 00DCACHE file explains device cache file path formation.

The 00PORTING file contains information on porting lsof to other UNIX

dialects.

The 00QUICKSTART file gives a quick introduction to using lsof.

The distribution files lsof.8 (nroff source) and lsof.man (nroff

formatted output) contain the manual page for lsof; it is the only

other documentation besides the source code (it's included).

Version 4 Binaries

==================

Version 4 binaries for some revisions, dialects, and platforms may be

found in pub/tools/unix/lsof/binaries. Check the README files for

exact descriptions. Check the dialect-specific Makefiles for

installation instructions. CHECKSUMS and GPG certificates are provided

for authentication.

Please think very carefully before you decide to use a pre-built binary

instead of making your own from the sources. Here are some points to

consider:

1. Lsof must run setgid or setuid. Are you willing to trust that

  power to a binary you didn't construct yourself?

2. Lsof binaries may be generated on a system whose configuration

header files differ from yours. Under Digital UNIX (DEC OSF/1), for

example, lsof includes header files from the machine's configuration

directory, /sys/<name>. Are you willing to gamble that your

configuration directory's header files match the ones used to

compile lsof?

3. Lsof is often configured with specific options that are determined

from the configuration of the system on which it is configured --

e.g., Solaris patch level, dynamic loader libraries, etc. Are you

sure that the lsof binary you retrieve will have been configured for

your system? If you get a binary that is misconfigured for you, it

may not work at all.

If you haven't already guessed, I believe firmly that you should

retrieve sources and build your own binary. If you still want to use

the distribution binaries, please authenticate what you retrieved with

the GPG certificates; please compare checksums, too.

Version 4 Checksums

====================

Security checksums -- both MD5 and sum(1) -- for revisions of lsof

version 4 are contained in the README.lsof_<rev> files in the wrapper

tar archives of pub/tools/unix/lsof.

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The CHECKSUMS file, found with the distribution archives, contains

information on validating the archives with external MD5 checksums and

external GPG certificates.

GPG Certificates

=================

The lsof wrapper tar archive includes a GPG certificate file in its

contained lsof_4.71_src.tar.sig file.

Binary files have detached GPG certificates that may be found in their

directories with ".sig" extensions.

The certificates are signed with my GPG public key, which may be found

in the file:

  ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/Victor_A_Abell.gpg

My key may also be available at some public key servers,

There is also authentication information in the CHECKSUMS file (a link

to CHECKSUMS_<rev>), found with the lsof distribution files. CHECKSUMS

contains external MD5 checksums for the distribution files and

information on using the external GPG certificates, found with the lsof

distribution files.

Old Dialect Support

====================

Remnants of source code and binaries for dialects for which lsof once

provided support may be obtained by request. Send the request to

abe@purdue.edu.

Dialects no longer supported include:

    CDC EP/IX

    MIPS RISC/os

    Motorola V/88

    Pyramid DC/OSx

    Pyramid Reliant UNIX

    Sequent DYNIX

    SGI IRIX

    SunOS 4.1.x

    Ultrix

Generally I drop support for a dialect when I no longer have access to

a test system.

Lsof Version 2

===============

The version 3 predecessor, revision 36 of version 2, is also available

upon request. Send the request to abe@purdue.edu.

I recommend you avoid lsof version 2. It's out of date and I no

longer provide support for it. (Versions 3 and 4 support more

dialects, and have many enhancements, bug fixes, and improvements.)

Version 2 was tested on the following UNIX dialects:

   AIX 3.2.[1234] for the IBM RISC/System 6000

   DEC OSF/1 1.[23] and 2.0 for the DEC Alpha

   EP/IX 1.4.3 and 2.1.1 for the CDC 4680

   ETAV 1.17 for the ETA-10P*

   FreeBSD 1.0e for x86-based systems

   HP-UX [789].x for HP systems

   IRIX 4.0.5 and 5.1.1 for SGI systems

   NEXTSTEP 2.1, 3.0, 3.1 for NeXT systems

   Sequent Dynix 3.0.12 for Sequent Symmetry systems

   SunOS 4.1.[123] for Sun 3 and 4 systems

   SunOS 5.[13] (Solaris 2.[13]) for Sun 4 systems

   Ultrix 2.2 and 4.2 for DEC systems

(If you need a copy of gunzip, look for it at prep.ai.mit.edu in

pub/gnu.)

Version 2 Checksums

====================

MD5:

   (OLD/lsof236tar.gz) = f8a1ab3971ea2f6a3ea16752f84409e8

sum(1):

   39996  106 OLD/lsof236tar.gz

The file OLD/lsof236tar.gz.asc is a detached PGP certificate that may

be used to authenticate OLD/lsof236tar.gz with my PGP public key. You

may find my PGP public key at:

 ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/OLD/Victor_A_Abell.pgp

Lsof Version 3

===============

The last revision of lsof version 3, 3.88, may obtained by request.

Send the request to abe@purdue.edu.

I recommend version 4 over version 3. It is the version I actively

support.

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Lsof version 3 was tested on these UNIX dialects:

AIX 3.2.5, 4.1[.[1234]], and 4.2

BSDI BSD/OS 2.0, 2.0.1, and 2.1 for x86-based systems

DC/OSx 1.1 for Pyramid systems

Digital UNIX (DEC OSF/1) 2.0, 3.0, 3.2, and 4.0

EP/IX 2.1.1 for the CDC 4680

FreeBSD 1.1.5.1, 2.0, 2.0.5, 2.1, 2.1.5 for x86-based

  systems

HP-UX 8.x, 9.x, 10.01, 10.10, and 10.20

IRIX 5.2, 5.3, 6.0, 6.0.1, and 6.[124]

Linux 2.0.3[01] and 2.1.57 for x86-based systems

NetBSD 1.0, 1.1, and 1.2 for x86 and SPARC-based

  systems

NEXTSTEP 2.1 and 3.[0123] for NEXTSTEP architectures

OpenBSD 1.2 and 2.0 for x86-based systems

Reliant UNIX 5.43 for Pyramid systems

RISC/os 4.52 for MIPS R2000-based systems

SCO OpenServer 1.1, 3.0, and 5.0.[024] for x86-based

  systems

SCO UnixWare 2.1 and 2.1.1 for x86-based systems

Sequent PTX 2.1.[1569], 4.0.[23], 4.1.[024], 4.2[.1],

  and 4.3

Solaris 2.[12345], 2.5.1, and 2.6-Beta

SunOS 4.1.x

Ultrix 4.2, 4.3, 4.4, and 4.5

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Vic Abell <abe@purdue.edu>

September 27, 2011

---

## LibXml2 (v2.7.8):

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list.c and the trio files, which are covered by a similar licence but

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--------------------------------------------------------------------------------------------------------------------------------

## Memstat (v0.8):

This is Debian GNU/Linux's prepackaged version of Joshua M. Yelon's memstat,

for a long time maintained upstream by Bernd Eckenfels <ecki@debian.org> and

now maintained by Michael Meskes <meskes@debian.org>.

This package was put together by me, Bernd Eckenfels <ecki@debian.org>,

from the sources, which I obtained from

http://charm.cs.uiuc.edu/~jyelon/software.html

The debian/* Files are based on Ian Jacksons hello Package.

All patches by me are subject to the GPL.

Original Copyright from memstat.c:

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Public License can be found in `/usr/share/common-licenses/GPL'.

--------------------------------------------------------------------------------------------------------------------------------

## Ncurses (v5.7):

-------------------------------------------------------------------------------

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--------------------------------------------------------------------------------

-- $Id: README,v 1.23 2006/04/22 22:19:37 tom Exp $

--------------------------------------------------------------------------------

README file for the ncurses package


See the file ANNOUNCE for a summary of ncurses features and ports.

See the file INSTALL for instructions on how to build and install ncurses.

See the file NEWS for a release history and bug-fix notes.

See the file TO-DO for things that still need doing, including known bugs.


Browse the file misc/ncurses-intro.html for narrative descriptions of how

to use ncurses and the panel, menu, and form libraries.


Browse the file doc/html/hackguide.html for a tour of the package internals.


ROADMAP AND PACKAGE OVERVIEW:


You should be reading this file in a directory called: ncurses-d.d, where d.d

is the current version number (see the dist.mk file in this directory for

that). There should be a number of subdirectories, including `c++', `form',

`man', `menu', `misc', `ncurses', `panel', `progs', `test', 'tack' and `Ada95'.

(The 'tack' program may be distributed separately).


A full build/install of this package typically installs several libraries, a

handful of utilities, and a database hierarchy. Here is an inventory of the

pieces:

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The libraries are:


libncurses.a    (normal)

libncurses.so    (shared)

libncurses_g.a    (debug and trace code enabled)

libncurses_p.a    (profiling enabled)


libpanel.a    (normal)

libpanel.so    (shared)

libpanel_g.a    (debug and trace code enabled)


libmenu.a    (normal)

libmenu.so    (shared)

libmenu_g.a    (debug enabled)


libform.a    (normal)

libform.so    (shared)

libform_g.a    (debug enabled)


If you configure using the --enable-widec option, a "w" is appended to the

library names (e.g., libncursesw.a), and the resulting libraries support

wide-characters, e.g., via a UTF-8 locale. The corresponding header files

are compatible with the non-wide-character configuration; wide-character

features are provided by ifdef's in the header files. The wide-character

library interfaces are not binary-compatible with the non-wide-character

version.

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The ncurses libraries implement the curses API. The panel, menu and forms

libraries implement clones of the SVr4 panel, menu and forms APIs. The source

code for these lives in the `ncurses', `panel', `menu', and `form' directories

respectively.


In the `c++' directory, you'll find code that defines an interface to the

curses, forms, menus and panels library packaged as C++ classes, and a demo program in C++

to test it. These class definition modules are not installed by the 'make

install.libs' rule as libncurses++.


In the `Ada95' directory, you'll find code and documentation for an

Ada95 binding of the curses API, to be used with the GNAT compiler.

This binding is built by a normal top-level `make' if configure detects

an usable version of GNAT (3.11 or above). It is not installed automatically.

See the Ada95 directory for more build and installation instructions and

for documentation of the binding.


To do its job, the ncurses code needs your terminal type to be set in the

environment variable TERM (normally set by your OS; under UNIX, getty(1)

typically does this, but you can override it in your .profile); and, it needs a

database of terminal descriptions in which to look up your terminal type's

capabilities.


In older (V7/BSD) versions of curses, the database was a flat text file,

/etc/termcap; in newer (USG/USL) versions, the database is a hierarchy of

fast-loading binary description blocks under /usr/lib/terminfo. These binary

blocks are compiled from an improved editable text representation called

`terminfo' format (documented in man/terminfo.5). The ncurses library can use

either /etc/termcap or the compiled binary terminfo blocks, but prefers the

second form.


In the `misc' directory, there is a text file terminfo.src, in editable

terminfo format, which can be used to generate the terminfo binaries (that's

what make install.data does). If the package was built with the

--enable-termcap option enabled, and the ncurses library cannot find a terminfo

description for your terminal, it will fall back to the termcap file supplied

with your system (which the ncurses package installation leaves strictly

alone).


The utilities are as follows:


    tic      -- terminfo source to binary compiler

    infocmp    -- terminfo binary to source decompiler/comparator

    clear    -- emits clear-screen for current terminal

    tput    -- shell-script access to terminal capabilities.

    toe      -- table of entries utility

    tset    -- terminal-initialization utility


The first two (tic and infocmp) are used for manipulating terminfo

descriptions; the next two (clear and tput) are for use in shell scripts. The

last (tset) is provided for 4.4BSD compatibility. The source code for all of

these lives in the `progs' directory.

Detailed documentation for all libraries and utilities can be found in the

`man' and `doc' directories. An HTML introduction to ncurses, panels, and

menus programming lives in the `doc/html' directory. Manpages in HTML format

are under `doc/html/man'.

The `test' directory contains programs that can be used to verify or

demonstrate the functions of the ncurses libraries. See test/README for

descriptions of these programs. Notably, the `ncurses' utility is designed to

help you systematically exercise the library functions.

AUTHORS:

Pavel Curtis:

   wrote the original ncurses

Zeyd M. Ben-Halim:

   port of original to Linux and many enhancements.

Thomas Dickey (maintainer for 1.9.9g through 4.1, resuming with FSF's 5.0):

   configuration scripts, porting, mods to adhere to XSI Curses in the

   areas of background color, terminal modes. Also memory leak testing,

   the wresize, default colors and key definition extensions and numerous

   bug fixes (more than half of those enumerated in NEWS beginning with

   the internal release 1.8.9).

Florian La Roche (official maintainer for FSF's ncurses 4.2)

Beginning with release 4.2, ncurses is distributed under an MIT-style

license.

Eric S. Raymond:

the man pages, infocmp(1), tput(1), clear(1), captoinfo(1), tset(1),

toe(1), most of tic(1), trace levels, the HTML intro, wgetnstr() and

many other entry points, the cursor-movement optimization, the

scroll-pack optimizer for vertical motions, the mouse interface and

xterm mouse support, and the ncurses test program.

Juergen Pfeifer

The menu and form libraries, C++ bindings for ncurses, menus, forms and

panels, as well as the Ada95 binding. Ongoing support for panel.

CONTRIBUTORS:

Alexander V. Lukyanov

for numerous fixes and improvements to the optimization logic.

David MacKenzie

for first-class bug-chasing and methodical testing.

Ross Ridge

for the code that hacks termcap parameterized strings into terminfo.

Warren Tucker and Gerhard Fuernkranz,

>   for writing and sending the panel library.

Hellmuth Michaelis,

>   for many patches and testing the optimization code.

Eric Newton, Ulrich Drepper, and Anatoly Ivasyuk:

>   the C++ code.

Jonathan Ross,

>   for lessons in using sed.

Keith Bostic (maintainer of 4.4BSD curses)

>   for help, criticism, comments, bug-finding, and being willing to

>   deep-six BSD curses for this one when it grew up.

Richard Stallman,

>   for his commitment to making ncurses free software.

Countless other people have contributed by reporting bugs, sending fixes,

suggesting improvements, and generally whining about ncurses :-)

BUGS:

>   See the INSTALL file for bug and developer-list addresses.

>   The Hacker's Guide in the doc directory includes some guidelines

>   on how to report bugs in ways that will get them fixed most quickly.

--------------------------------------------------------------------------------------------------------------------

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## Pcre (v8.30):

PCRE LICENCE

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PCRE is a library of functions to support regular expressions whose syntax and semantics are as close as possible to those of the Perl 5 language.

Release 8 of PCRE is distributed under the terms of the "BSD" licence, as specified below. The documentation for PCRE, supplied in the "doc" directory, is distributed under the same terms as the software itself.

The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions, and a just-in-time compiler that can be used to optimize pattern matching. These are both optional features that can be omitted when the library is built.

THE BASIC LIBRARY FUNCTIONS

---------------------------

Written by:    Philip Hazel

Email local part: ph10

Email domain:   cam.ac.uk

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University of Cambridge Computing Service,

Cambridge, England.

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PCRE JUST-IN-TIME COMPILATION SUPPORT

-------------------------------------

Written by:    Zoltan Herczeg

Email local part: hzmester

Emain domain:   freemail.hu

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STACK-LESS JUST-IN-TIME COMPILER

-------------------------------

Written by:    Zoltan Herczeg

Email local part: hzmester

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THE C++ WRAPPER FUNCTIONS

-------------------------

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### Popt (v1.16):

This is the popt(3) command line option parsing library. While it is similiar

to getopt(3), it contains a number of enhancements, including:


    1) popt is fully reentrant

    2) popt can parse arbitrary argv[] style arrays while

     getopt(3) makes this quite difficult

    3) popt allows users to alias command line arguments

    4) popt provides convience functions for parsing strings

     into argv[] style arrays


Complete documentation on popt(3) is available in popt.ps (included in this

tarball), which is excerpted with permission from the book "Linux

Application Development" by Michael K. Johnson and Erik Troan (available

from Addison Wesley in May, 1998).


Comments on popt should be addressed to popt-devel@rpm5.org.

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### ROM-Bootloader:

Boot strategies

AT91 chips embed a boot ROM code. It is enabled depending on BMS (Boot Mode Select) pin state on reset.

The ROM code scans the contents of different media like serial FLASH, NAND FLASH, SD/MMC Card and serial EEPROM.

If a valid application is available then it downloads this application into the chip internal SRAM and runs it.

To determine if a valid application is present the ROM code checks the eight ARM exception vectors.

If no valid application is available then SAM-BA Monitor is executed. It waits for transactions either on the USB device,

or on the DBGU serial port, then the SAM-BA tool can be used to program FLASH or EEPROM present on your board.

For more information on this topic, please check the corresponding SAM product datasheet section Boot Strategies.

---------------------------------------------------------------------------------------------------------------------------

### GNU Tar (v1.17):

README for GNU tar

See the end of file for copying conditions.

* Introduction

Please glance through *all* sections of this

'README' file before starting configuration. Also make sure you read files

'ABOUT-NLS' and 'INSTALL' if you are not familiar with them already.

If you got the 'tar' distribution in 'shar' format, time stamps ought to be

properly restored; do not ignore such complaints at 'unshar' time.

GNU 'tar' saves many files together into a single tape or disk

archive, and can restore individual files from the archive. It includes

multivolume support, the ability to archive sparse files, automatic archive

compression/decompression, remote archives and special features that allow

'tar' to be used for incremental and full backups. This distribution

also includes 'rmt', the remote tape server. The 'mt' tape drive control

program is in the GNU 'cpio' distribution.

GNU 'tar' is derived from John Gilmore's public domain 'tar'.

See file 'ABOUT-NLS' for how to customize this program to your language.

See file 'COPYING' for copying conditions.

See file 'INSTALL' for compilation and installation instructions.

See file 'PORTS' for various ports of GNU tar to non-Unix systems.

See file 'NEWS' for a list of major changes in the current release.

See file 'THANKS' for a list of contributors.

Besides those configure options documented in files 'INSTALL' and

'ABOUT-NLS', an extra option may be accepted after './configure':

* Install

** Selecting the default archive format.

The default archive format is GNU, this can be overridden by

presetting DEFAULT_ARCHIVE_FORMAT while configuring. The allowed

values are GNU, V7, OLDGNU, USTAR and POSIX.

** Selecting the default archive device

The default archive device is now 'stdin' on read and 'stdout' on write.

The installer can still override this by presetting 'DEFAULT_ARCHIVE'

in the environment before configuring (the behavior of '-[0-7]' or

'-[0-7]lmh' options in 'tar' are then derived automatically). Similarly,

'DEFAULT_BLOCKING' can be preset to something else than 20.

** Selecting full pathname of the "rmt" binary.

Previous versions of tar always looked for "rmt" binary in the

directory "/etc/rmt". However, the "rmt" program included

in the distribution was installed under "$prefix/libexec/rmt".

To fix this discrepancy, tar now looks for "$prefix/libexec/rmt".

If you do not want this behavior, specify full path name of

"rmt" binary using DEFAULT_RMT_DIR variable, e.g.:

./configure DEFAULT_RMT_DIR=/etc

If you already have a copy of "rmt" installed and wish to use it

instead of the version supplied with the distribution, use --with-rmt

option:

./configure --with-rmt=/etc/rmt

This will also disable building the included version of rmt.

** Installing backup scripts.

This version of tar is shipped with the shell scripts for producing

incremental backups (dumps) and restoring filesystems from them.

The name of the backup script is "backup". The name of the

restore script is "restore". They are installed in "$prefix/sbin"

directory.

Use option --enable-backup-scripts to compile and install these

scripts.

** '--disable-largefile' omits support for large files, even if the

operating system supports large files. Typically, large files are

those larger than 2 GB on a 32-bit host.

* Installation hints

Here are a few hints which might help installing 'tar' on some systems.

** gzip and bzip2.

GNU tar uses the gzip and bzip2 programs to read and write compressed

archives. If you don't have these programs already, you need to

install them. Their sources can be found at:


ftp://ftp.gnu.org/gnu/gzip/

http://sourceware.cygnus.com/bzip2/


If you see the following symptoms:


```
$ tar -xzf file.tar.gz

gzip: stdin: decompression OK, trailing garbage ignored

tar: Child returned status 2
```


then you have encountered a gzip incompatibility that should be fixed

in gzip test version 1.3, which as of this writing is available at

<ftp://alpha.gnu.org/gnu/gzip/>. You can work around the

incompatibility by using a shell command like

 'gzip -d <file.tar.gz | tar -xzf -'.


** Solaris issues.


GNU tar exercises many features that can cause problems with older GCC

versions. In particular, GCC 2.8.1 (sparc, -O1 or -O2) is known to

miscompile GNU tar. No compiler-related problems have been reported

when using GCC 2.95.2 or later.

Recent versions of Solaris tar sport a new -E option to generate

extended headers in an undocumented format. GNU tar does not

understand these headers.


** Static linking.


Some platform will, by default, prepare a smaller 'tar' executable

which depends on shared libraries. Since GNU 'tar' may be used for

system-level backups and disaster recovery, installers might prefer to

force static linking, making a bigger 'tar' executable maybe, but able to

work standalone, in situations where shared libraries are not available.

The way to achieve static linking varies between systems. Set LDFLAGS

to a value from the table below, before configuration (see 'INSTALL').


| Platform | Compiler | LDFLAGS |
|----------|----------|---------|
| (any) | Gnu C | -static |
| AIX | (vendor) | -bnso -bI:/lib/syscalls.exp |
| HPUX | (vendor) | -Wl,-a,archive |
| IRIX | (vendor) | -non_shared |
| OSF | (vendor) | -non_shared |
| SCO 3.2v5 | (vendor) | -dn |
| Solaris | (vendor) | -Bstatic |
| SunOS | (vendor) | -Bstatic |


** Failed tests 'ignfail.sh' or 'incremen.sh'.

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In an NFS environment, lack of synchronization between machine clocks

might create difficulties to any tool comparing dates and file time stamps,

like 'tar' in incremental dumps. This has been a recurrent problem with

GNU Make for the last few years. We would like a general solution.


** BSD compatibility matters.


Set LIBS to '-lbsd' before configuration (see 'INSTALL') if the linker

complains about 'bsd_ioctl' (Slackware). Also set CPPFLAGS to

'-I/usr/include/bsd' if <sgtty.h> is not found (Slackware).


** OPENStep 4.2 swap files


Tar cannot read the file /private/vm/swapfile.front (even as root).

This file is not a real file, but some kind of uncompressed view of

the real compressed swap file; there is no reason to back it up, so

the simplest workaround is to avoid tarring this file.


* Special topics


Here are a few special matters about GNU 'tar', not related to build

matters. See previous section for such.


** File attributes.


About *security*, it is probable that future releases of 'tar' will have

some behavior changed. There are many pending suggestions to choose from.

Today, extracting an archive not being 'root', 'tar' will restore suid/sgid

bits on files but owned by the extracting user. 'root' automatically gets

a lot of special privileges, '-p' might later become required to get them.

GNU 'tar' does not properly restore symlink attributes. Various systems

implement flavors of symbolic links showing different behavior and

properties. We did not successfully sorted all these out yet. Currently,

the 'lchown' call will be used if available, but that's all.

** POSIX compliance.

GNU 'tar' is able to create archive in the following formats:

 *** The format of UNIX version 7

 *** POSIX.1-1988 format, also known as "ustar format"

 *** POSIX.1-2001 format, also known as "pax format"

 *** Old GNU format (described below)

In addition to those, GNU 'tar' is also able to read archives

produced by 'star' archiver.

A so called 'Old GNU' format is based on an early draft of the

POSIX 1003.1 'ustar' standard which is different from the final

standard. It defines its extensions (such as incremental backups

and handling of the long file names) in a way incompatible with

any existing tar archive format, therefore the use of old GNU

format is strongly discouraged.

Please read the file NEWS for more information about POSIX compliance

and new 'tar' features.

* What's next?

GNU tar will be merged into GNU paxutils: a project containing

several utilities related to creating and handling archives in

various formats. The project will include tar, cpio and pax

utilities.

* Bug reporting.

Send bug reports to <bug-tar@gnu.org>. A bug report should contain

an adequate description of the problem, your input, what you expected,

what you got, and why this is wrong. Diffs are welcome, but they only

describe a solution, from which the problem might be uneasy to infer.

If needed, submit actual data files with your report. Small data files

are preferred. Big files may sometimes be necessary, but do not send them

to the report address; rather take special arrangement with the maintainer.

Your feedback will help us to make a better and more portable package.

Consider documentation errors as bugs, and report them as such. If you

develop anything pertaining to 'tar' or have suggestions, let us know

and share your findings by writing to <bug-tar@gnu.org>.

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Foundation, then where a range of years appears, this is an inclusive

range that applies to every year in the range. For example: 2005-2008

represents the years 2005, 2006, 2007, and 2008.

Local Variables:

mode: outline

paragraph-separate: "[]*$"

version-control: never

End:

----------------------------------------------------------------------------------------------------------------------

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### u-boot (v2010.09):

U-Boot is Free Software. It is copyrighted by Wolfgang Denk and many others who contributed code (see the actual source code and the git commit messages for details). You can redistribute U-Boot and/or modify it under the terms of version 2 of the GNU General Public License as published by the Free Software Foundation. Most of it can also be distributed, at your option, under any later version of the GNU General Public License -- see individual files for exceptions.

NOTE! This license does not cover the so-called "standalone" applications that use U-Boot services by means of the jump table provided by U-Boot exactly for this purpose - this is merely considered normal use of U-Boot, and does not fall under the heading of "derived work" -- see file Licenses/Exceptions for details.

Also note that the GPL and the other licenses are copyrighted by the Free Software Foundation and other organizations, but the instance of code that they refer to (the U-Boot source code) is copyrighted by me and others who actually wrote it.

 -- Wolfgang Denk

Like many other projects, U-Boot had a tradition of including big blocks of License headers in all files. This not only blew up the source code with mostly redundant information, but also made it very difficult to generate License Clearing Reports. An additional problem was that even the same licenses were referred to by a number of slightly varying text blocks (full, abbreviated, different indentation, line wrapping and/or white space, with obsolete address information, ...) which made automatic processing a nightmare.

To make this easier, such license headers in the source files have been replaced with a single line reference to Unique Lincense Identifiers as defined by the Linux Foundation's SPDX project [1]. For example, in a source file the full "GPL v2.0 or later" header text was replaced by a single line:

SPDX-License-Identifier:    GPL-2.0+

We use the SPDX Unique Lincense Identifiers here; these are available at [2].

[1] http://spdx.org/

[2] http://spdx.org/licenses/

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## uClibc (v0.9.31.1):

A C library for embedded Linux

uClibc (aka μClibc/pronounced yew-see-lib-see) is a C library for developing embedded Linux systems. It is much smaller than the GNU C Library, but nearly all applications supported by glibc also work perfectly with uClibc. Porting applications from glibc to uClibc typically involves just recompiling the source code. uClibc even supports shared libraries and threading. It currently runs on standard Linux and MMU-less (also known as μClinux) systems with support for alpha, amd64, ARM, Blackfin, cris, h8300, hppa, i386, i960, ia64, m68k, mips/mipsel, PowerPC, SH, SPARC, and v850 processors.

If you are building an embedded Linux system and you find that glibc is eating up too much space, you may want to consider using uClibc. If you are building a huge fileserver with 12 Terabytes of storage, then using glibc may make more sense. Unless, for example, that 12 Terabytes will be Network Attached Storage and you plan to burn Linux into the system's firmware...

uClibc is maintained by Erik Andersen and is licensed under the GNU LESSER GENERAL PUBLIC LICENSE . This license allows you to make closed source commercial applications using uClibc. (Please consider sharing some of the money you make ;-). You do not need to give away all your source code just because you use uClibc and/or run on Linux. See the list of Frequently Asked Questions for details.

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### Udev (v058):

udev - a userspace implementation of devfs

For more information on the design, and structure of this project, see the

files in the docs/ directory.

To use:

- You must be running a 2.6 version of the Linux kernel.

- Your 2.6 kernel must have had CONFIG_HOTPLUG enabled when it was built.

- Make sure sysfs is mounted. udev will figure out where sysfs is mounted, but

 the traditional place for it is at /sys. You can mount it by hand by running:

    mount -t sysfs none /sys

- Make sure you have the latest version of the linux-hotplug scripts. They are

 available at linux-hotplug.sf.net or from your local kernel.org mirror at:

    kernel.org/pub/linux/utils/kernel/hotplug/

 They are required in order for udev to work properly.

 If for some reason you do not install the hotplug scripts, you must tell the

 kernel to point the hotplug binary at wherever you install udev at. This can

 be done by:

    echo "/sbin/udev" > /proc/sys/kernel/hotplug

- Build the project:

    make


Note:

 There are a number of different flags that you can use when building

 udev. They are as follows:

  prefix

       set this to the default root that you want udev to be

       installed into. This works just like the 'configure --prefix'

       script does. Default value is ''. Only override this if you

       really know what you are doing.

  USE_KLIBC

       if set to 'true', udev is built and linked against the

       included version of klibc. Default value is 'false'.

  USE_LOG

       if set to 'true', udev will emit messages to the syslog when

       it creates or removes device nodes. This is helpful to see

       what udev is doing. This is enabled by default. Note, if you

       are building udev against klibc it is recommended that you

       disable this option (due to klibc's syslog implementation.)

  USE_SELINUX

       if set to 'true', udev will be built with SELinux support

       enabled. This is disabled by default.

  DEBUG

       if set to 'true', debugging messages will be sent to the syslog

       as udev is run. Default value is 'false'.

  KERNEL_DIR

If this is not set it will default to /lib/modules/`uname -r`/build

This is used if USE_KLIBC=true to find the kernel include

directory that klibc needs to build against. This must be set

if you are not building udev while running a 2.6 kernel.

So, if you want to build udev using klibc with debugging messages, you

would do:

make USE_KLIBC=true DEBUG=true

- Install the project:

make install

This will put the udev binary in /sbin, create the /udev and /etc/udev

directories, and place the udev configuration files in /etc/udev. You

will probably want to edit the *.rules files to create custom naming

rules. More info on how the config files are set up are contained in

comments in the files, and is located in the documentation.

- Add and remove devices from the system and marvel as nodes are created

and removed in /udev/ based on the device types.

- If you later get sick of it, uninstall it:

make uninstall

Things are still quite rough, but it should work properly. If nothing

seems to happen, make sure your build worked properly by running the

udev-test.pl script as root in the test/ subdirectory of the udev source

tree.

Development and documentation help is very much appreciated, see the TODO

file for a list of things left to be done.

Any comment/questions/concerns please let me and the other udev developers

know by sending a message to the linux-hotplug-devel mailing list at:

linux-hotplug-devel@lists.sourceforge.net

greg k-h

greg@kroah.com

---------------------------------------------------------------------------------------------------------------------------------

## Util-Linux (v2.20.1):

util-linux

util-linux is a random collection of Linux utilities

Note that in years 2006-2010 this project used the name "util-linux-ng".

WEB PAGE:

http://kernel.org/~kzak/util-linux/

MAILING LIST:

  E-MAIL: util-linux@vger.kernel.org

  URL:  http://vger.kernel.org/vger-lists.html#util-linux

DOWNLOAD:

  ftp://ftp.kernel.org/pub/linux/utils/util-linux/

SOURCE CODE:

  Web interface:

   http://git.kernel.org/?p=utils/util-linux/util-linux.git

  Checkout:

   git clone git://git.kernel.org/pub/scm/utils/util-linux/util-linux.git util-linux

NLS (PO TRANSLATIONS):

  PO files are maintained by:

   http://translationproject.org/domain/util-linux-ng.html

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NEUTRALITY:

The stuff in util-linux should be rather distribution-neutral.

No RPMs/DEBs/... are provided - get yours from your distributor.

VERSION SCHEMA:

Standard releases:

<major>.<minor>[.<maint>[.<bugfix>]]

major = fatal and deep changes

minor = typical release with new features

maint = maintenance releases; bug fixes only

bugfix = unplanned releases for critical/security bugs

Development releases:

<major>.<minor>-rc<N>

COMPILATION:

See the INSTALL file for more details.

Notes:

* use SUID_CFLAGS and SUID_LDFLAGS when you want to define special

  compiler options for typical suid programs, for example:


    ./configure SUID_CFLAGS="-fpie" SUID_LDFLAGS="-pie"


  This feature is currently supported for chfn, chsh, newgrp,

  write, mount, and umount.



STATIC LINKING:


  Use --enable-static-programs[=LIST] configure option when you want to use

  statically linked programs.


  Note, mount(8) uses get{pw,gr}nam() and getpwuid() functions for

  translation from username and groupname to UID and GID. These functions

  could be implemented by dynamically loaded independent modules (NSS) in

  your libc (e.g. glibc). These modules are not statically linked to

  mount(8) and mount.static is still using dlopen() like dynamically

  linked version.


  The translation won't work in environment where NSS modules are

  not installed.

For example normal system (NSS modules are available):

```
# ./mount.static -v -f -n -ouid=kzak /mnt/foo

LABEL=/mnt/foo on /mnt/foo type vfat (rw,uid=500)

          ^^^^^^^
```

and without NSS modules:

```
# chroot . ./mount.static -v -f -n -ouid=kzak /mnt/win

LABEL=/mnt/win on /mnt/win type vfat (rw,uid=kzak)

          ^^^^^^^^
```

--------------------------------------------------------------------------------------------------------------------------

## XML-RPC++ (v0.7):

```
#ifndef _XMLRPC_H_

#define _XMLRPC_H_

//

// XmlRpc++ Copyright (c) 2002-2003 by Chris Morley

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// modify it under the terms of the GNU Lesser General Public

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//

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//

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```

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// Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307

//


/* changed by ise GmbH 2013 */


#if defined(_MSC_VER)

# pragma warning(disable:4786)  // identifier was truncated in debug info

#endif


#ifndef MAKEDEPEND

# include <string>

#endif


#include "dllexport.h"

#include "XmlRpcClient.h"

#include "XmlRpcException.h"

#include "XmlRpcServer.h"

#include "XmlRpcServerProxy.h"

#include "XmlRpcServerMethod.h"

#include "XmlRpcValue.h"

#include "XmlRpcUtil.h"


namespace XmlRpc {

```
//! An interface allowing custom handling of error message reporting.

class XMLRPC_DLLEXPORT XmlRpcErrorHandler {

public:

 //! Returns a pointer to the currently installed error handling object.

 static XmlRpcErrorHandler* getErrorHandler()

 { return _errorHandler; }


 //! Specifies the error handler.

 static void setErrorHandler(XmlRpcErrorHandler* eh)

 { _errorHandler = eh; }


 //! Report an error. Custom error handlers should define this method.

 virtual void error(const char* msg) = 0;


 //! Define virtual destructor to avoid compiler warnings

 virtual ~XmlRpcErrorHandler(){};


protected:

 static XmlRpcErrorHandler* _errorHandler;

};
```

//! An interface allowing custom handling of informational message reporting.

class XMLRPC_DLLEXPORT XmlRpcLogHandler {

public:

 //! Returns a pointer to the currently installed message reporting object.

 static XmlRpcLogHandler* getLogHandler()

 { return _logHandler; }


 //! Specifies the message handler.

 static void setLogHandler(XmlRpcLogHandler* lh)

 { _logHandler = lh; }


 //! Returns the level of verbosity of informational messages. 0 is no output, 5 is very verbose.

 static int getVerbosity()

 { return _verbosity; }


 //! Specify the level of verbosity of informational messages. 0 is no output, 5 is very verbose.

 static void setVerbosity(int v)

 { _verbosity = v; }


 //! Output a message. Custom error handlers should define this method.

 virtual void log(int level, const char* msg) = 0;


 //! Define virtual destructor to avoid compiler warnings

 virtual ~XmlRpcLogHandler(){};

protected:

 static XmlRpcLogHandler* _logHandler;

 static int _verbosity;

 };


//! Returns log message verbosity. This is short for XmlRpcLogHandler::getVerbosity()

int XMLRPC_DLLEXPORT getVerbosity();

//! Sets log message verbosity. This is short for XmlRpcLogHandler::setVerbosity(level)

void XMLRPC_DLLEXPORT setVerbosity(int level);


//! Version identifier

 extern const char XMLRPC_VERSION[];


} // namespace XmlRpc


#endif // _XMLRPC_H_

-----------------------------------------------------------------------------------------------------------------------------

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### Zlib (v1.2.6):

ZLIB DATA COMPRESSION LIBRARY


zlib 1.2.6 is a general purpose data compression library. All the code is

thread safe. The data format used by the zlib library is described by RFCs

(Request for Comments) 1950 to 1952 in the files

http://tools.ietf.org/html/rfc1950 (zlib format), rfc1951 (deflate format) and

rfc1952 (gzip format).


All functions of the compression library are documented in the file zlib.h

(volunteer to write man pages welcome, contact zlib@gzip.org). A usage example

of the library is given in the file test/example.c which also tests that

the library is working correctly. Another example is given in the file

test/minigzip.c. The compression library itself is composed of all source

files in the root directory.

To compile all files and run the test program, follow the instructions given at the top of Makefile.in. In short "./configure; make test", and if that goes well, "make install" should work for most flavors of Unix. For Windows, use one of the special makefiles in win32/ or contrib/vstudio/ . For VMS, use make_vms.com.

Questions about zlib should be sent to <zlib@gzip.org>, or to Gilles Vollant <info@winimage.com> for the Windows DLL version. The zlib home page is http://zlib.net/ . Before reporting a problem, please check this site to verify that you have the latest version of zlib; otherwise get the latest version and check whether the problem still exists or not.

PLEASE read the zlib FAQ http://zlib.net/zlib_faq.html before asking for help.

Mark Nelson <markn@ieee.org> wrote an article about zlib for the Jan. 1997 issue of Dr. Dobb's Journal; a copy of the article is available at http://marknelson.us/1997/01/01/zlib-engine/ .

The changes made in version 1.2.6 are documented in the file ChangeLog.

Unsupported third party contributions are provided in directory contrib/ .

zlib is available in Java using the java.util.zip package, documented at http://java.sun.com/developer/technicalArticles/Programming/compression/ .

A Perl interface to zlib written by Paul Marquess <pmqs@cpan.org> is available

at CPAN (Comprehensive Perl Archive Network) sites, including

http://search.cpan.org/~pmqs/IO-Compress-Zlib/ .


A Python interface to zlib written by A.M. Kuchling <amk@amk.ca> is

available in Python 1.5 and later versions, see

http://docs.python.org/library/zlib.html .


zlib is built into tcl: http://wiki.tcl.tk/4610 .


An experimental package to read and write files in .zip format, written on top

of zlib by Gilles Vollant <info@winimage.com>, is available in the

contrib/minizip directory of zlib.


Notes for some targets:


- For Windows DLL versions, please see win32/DLL_FAQ.txt


- For 64-bit Irix, deflate.c must be compiled without any optimization. With

 -O, one libpng test fails. The test works in 32 bit mode (with the -n32

 compiler flag). The compiler bug has been reported to SGI.


- zlib doesn't work with gcc 2.6.3 on a DEC 3000/300LX under OSF/1 2.1 it works

 when compiled with cc.

- On Digital Unix 4.0D (formely OSF/1) on AlphaServer, the cc option -std1 is

 necessary to get gzprintf working correctly. This is done by configure.


- zlib doesn't work on HP-UX 9.05 with some versions of /bin/cc. It works with

 other compilers. Use "make test" to check your compiler.


- gzdopen is not supported on RISCOS or BEOS.


- For PalmOs, see http://palmzlib.sourceforge.net/


Acknowledgments:


 The deflate format used by zlib was defined by Phil Katz. The deflate and

 zlib specifications were written by L. Peter Deutsch. Thanks to all the

 people who reported problems and suggested various improvements in zlib; they

 are too numerous to cite here.


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Jean-loup Gailly     Mark Adler

jloup@gzip.org     madler@alumni.caltech.edu


If you use the zlib library in a product, we would appreciate *not* receiving

lengthy legal documents to sign. The sources are provided for free but without

warranty of any kind. The library has been entirely written by Jean-loup

Gailly and Mark Adler; it does not include third-party code.


If you redistribute modified sources, we would appreciate that you include in

the file ChangeLog history information documenting your changes. Please read

the FAQ for more information on the distribution of modified source versions.

--------------------------------------------------------------------------------------------------------------------

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Version 3, 29 June 2007

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<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

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-----------------------------------------------------------------------------------------------------------------

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Version 2.1, February 1999

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