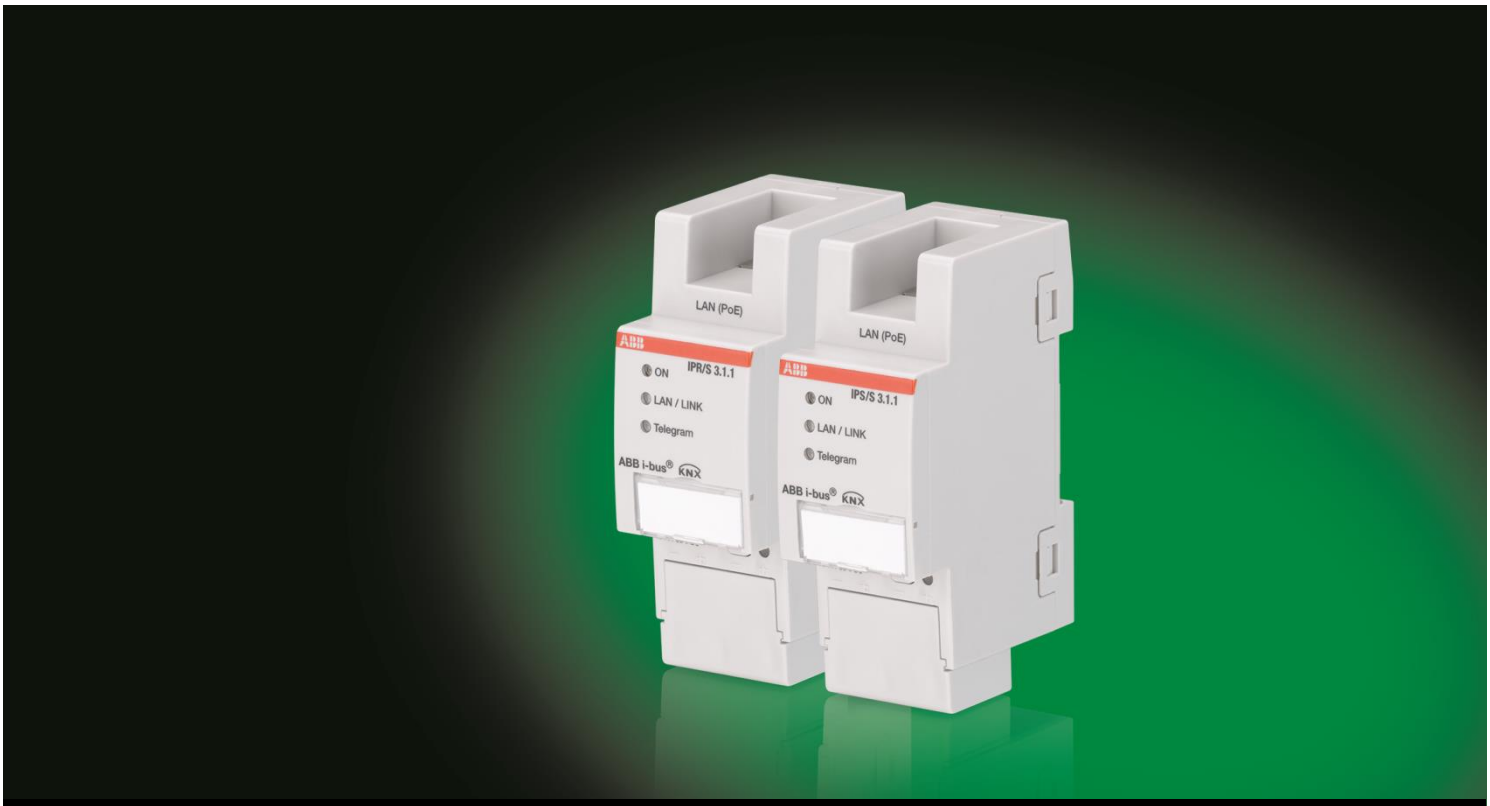

ABB i-bus® KNX
Routeur IP IPR/S 3.1.1
Manuel produit

Power and productivity
for a better world™

Sommaire

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1 Généralités

Le routeur IP IPR/S 3.1.1 ABB i-bus® permet de connecter le bus KNX à un réseau Ethernet. Le réseau permet l'envoi ou la réception de télégrammes KNX vers ou depuis d'autres appareils.

1.1 Utilisation du manuel produit

Le présent manuel vous donne des informations techniques détaillées sur le fonctionnement, le montage et la programmation de l'appareil ABB i-bus® KNX. L'utilisation de l'appareil est décrite au moyen d'exemples.

Le manuel comprend les chapitres suivants :

Chapitre 1	Généralités
Chapitre 2	Description technique de l'appareil
Chapitre 3	Mise en service
Chapitre 4	Planification et mise en œuvre
Chapitre A	Annexe

1.1.1 Remarques

Les remarques et consignes de sécurité de ce manuel sont présentées de la façon suivante :

Remarque
Astuces destinées à la simplification de l'utilisation

Exemples
Exemples d'utilisation, exemples de montage, exemples de programmation

Important
Cette consigne de sécurité est utilisée dès qu'il existe un risque de perturbation d'une fonction, sans pour autant engendrer un risque de détérioration ou de blessure.

Attention
Cette consigne de sécurité est utilisée dès qu'il existe un risque de perturbation d'une fonction, sans pour autant engendrer un risque de détérioration ou de blessure.

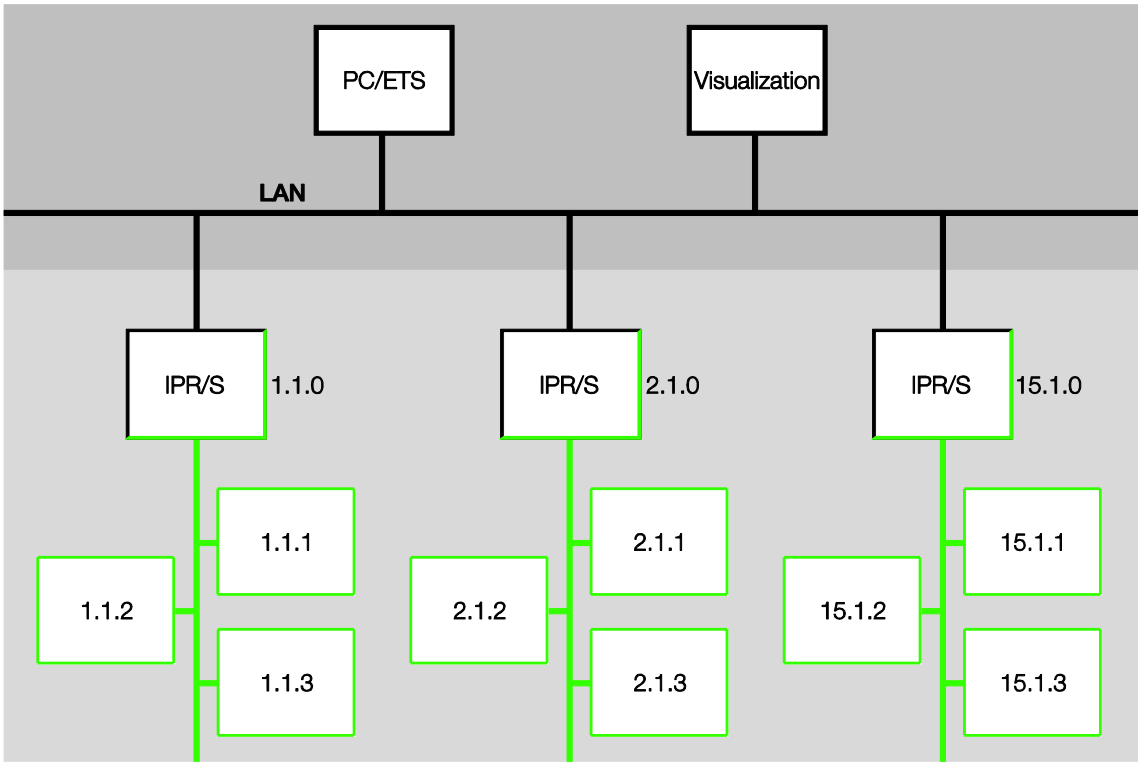
 **Danger**
Cette consigne de sécurité est utilisée dès qu'une utilisation inappropriée expose à un danger la vie ou l'intégrité corporelle.

 **Danger**
Cette consigne de sécurité est utilisée dès qu'une utilisation inappropriée expose à un danger de mort.

1.2 Vue d'ensemble du produit et de ses fonctions

Le routeur IP IPR/S 3.1.1 ABB i-bus® permet de connecter le bus KNX à un réseau Ethernet. Le réseau permet l'envoi ou la réception de télégrammes KNX vers ou depuis d'autres appareils.

L'appareil communique à l'aide du protocole KNXnet/IP de l'Association KNX (routage et tunneling).



Le routeur dispose de 5 serveurs de tunneling Utilisation des serveurs de tunneling intégrés, p. 38. Ceux-ci prennent en charge le moniteur de bus aussi bien que le mode moniteur de groupe (alternativement).

En plus de la communication KNX standard (Multicast), jusqu'à 10 routeurs IP ABB IPR/S 3.1.1 peuvent également communiquer entre eux via le protocole Unicast. Voir chapitre Télégrammes KNX sur le réseau, p. 42.

L'appareil peut être alimenté en tension par câble Ethernet (Power over Ethernet - PoE) conformément à la norme IEEE 802.3af classe 1 ou par une tension auxiliaire.

L'utilisation de l'ABB i-bus® Tool permet de détecter les routeurs sur le réseau (IP Discovery), de paramétrer la communication Unicast et, si nécessaire, de mettre à jour le firmware. Voir chapitre L'i-bus® Tool, p. 47.

L'appareil prend en charge la fonction KNX standard de surveillance de coupure de tension du bus. Il s'agit d'une fonction de gestion réseau utilisée par exemple par des programmes de visualisation (voir chapitre Surveillance de coupure de la tension du bus, p. 6).

Le routeur IP prend en charge la table de filtrage complète pour tous les groupes principaux, c.-à-d. que les groupes principaux 0…31 (ou les adresses de groupes 1…65 535 en cas de vue libre d'adresses de groupes) peuvent être organisés. ETS prend en charge cette fonction à partir de la version 4.1.7.

1.2.1 Surveillance de coupure de la tension du bus

Le routeur IP surveille le bus TP KNX pour détecter toute coupure de tension. En cas de modification de l'état de la tension du bus, une commande broadcast de type « NetworkParameterWrite » est envoyée sur le réseau IP.

Les valeurs suivantes sont envoyées :

- Coupure de la tension du bus : « 00063301 » (hex.)
- Retour de la tension du bus : « 00063300 » (hex.)

Ces télégrammes peuvent être évalués, par exemple par un programme de visualisation.

Type	DPT	Info
NetworkParameterWrite		00 06 33 01
NetworkParameterWrite		00 06 33 00

1.2.2 Vue d'ensemble des versions

Le tableau suivant propose une vue d'ensemble des fonctions offertes par les appareils IPR/S 2.1 et IPR/S 3.1.1 et les programmes d'application *Routeur IP/1.0* (ETS 3 et ETS 4)*, Routeur IP/1.1* (ETS 3) et *Routeur IP/2.0 (ETS 4)*.

Appareil	**IPR/S 2.1**	**IPR/S 3.1.1**	**IPR/S 3.1.1**
Application	**Routeur IP/1.0**	**Routeur IP/1.1**	**Routeur IP/2.0**
ETS	**ETS 3/ETS 4**	**ETS 3**	**ETS 4/ETS 5**
Caractéristiques *Routeur IP*			
Nombre de serveurs de tunneling	1	1	5
Nombre de connexions Unicast	3	10	10
Surveillance de coupure de la tension du bus (voir chapitre Surveillance de coupure de la tension du bus, p. 6)	-	■	■
Filtrage des télégrammes de groupe du groupe principal 0...13	■	■	■
Filtrage des télégrammes de groupe du groupe principal 14...31	-	-	■ (version ETS 4.1.7 et ultér.)
IP Discovery (i-bus® Tool)	■	■	■
Mise à jour du firmware (i-bus® Tool)	-	■	■
Paramétrage Unicast (i-bus® Tool)	-	■	■
Tension par câble Ethernet (PoE)	-	■	■

■ = La caractéristique s'applique

- = La caractéristique ne s'applique pas

Remarque

L'application *Routeur IP/2.0* n'est prise en charge par ETS 4 qu'à partir de la version 4.1.7 et par ETS 5 qu'à partir de la version 5.0.4.

Remarque

Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

2 Description technique de l'appareil

IPR/S 3.1.1

Le routeur IP 3.1.1 assure l'interface entre des installations KNX et des réseaux IP. Il peut être utilisé comme coupleur de ligne ou de zone et peut utiliser le réseau local (LAN) afin de permettre l'échange de télégrammes entre les lignes/zones.

ETS permet de programmer des appareils KNX via le réseau LAN (5 serveurs de tunneling sont disponibles). L'appareil utilise le protocole KNXnet/IP de l'Association KNX (routage et tunneling).
L'appareil peut également communiquer par connexion Unicast.
L'appareil est alimenté par une tension de 12 à 30 V CC ou par une tension par câble Ethernet (Power over Ethernet - PoE).

2.1 Caractéristiques techniques

Alimentation	Tension auxiliaire U_S	12…30 V CC (+10 % / -15 %) ou PoE (IEEE 802.3af classe 1)
	Puissance dissipée	Maximum 1,8 W
	Courant consommé tension auxiliaire	Maximum 120 mA à 12 V
	Tension nominale U_N	12 V CC
	Courant consommé KNX	< 10 mA
Raccordement	KNX	Borne de raccordement du bus
	Borne enfichable pour tension d'alimentation	Borne enfichable
	LAN	Prise RJ45 pour réseaux 10/100BaseT, IEEE 802.3, détection automatique
Éléments de commande et d'affichage	LED rouge et bouton	Pour affectation de l'adresse physique
	LED verte « On »	Indication prêt à fonctionner
	LED jaune « LAN/Link »	Indication connexion réseau
	LED jaune « Telegram »	Indication transmission de télégrammes KNX
Indice de protection	IP 20	Selon DIN EN 60 529
Classe de protection	II	Selon DIN EN 61 140
Classe d'isolation	Classe de surtension	III selon DIN EN 60 664-1
	Degré de contamination	2 selon DIN EN 60 664-1
Basse tension de sécurité KNX	TBTS 30 V CC	
Plage de température	Fonctionnement	-5 °C…+45 °C
	Stockage	-25 °C…+55 °C
	Transport	-25 °C…+70 °C
Conditions ambiantes	Humidité relative maximale	95 %, aucune condensation admissible
	Pression atmosphérique	Atmosphère jusqu'à 2 000 m

ABB i-bus® KNX
Description technique de l'appareil

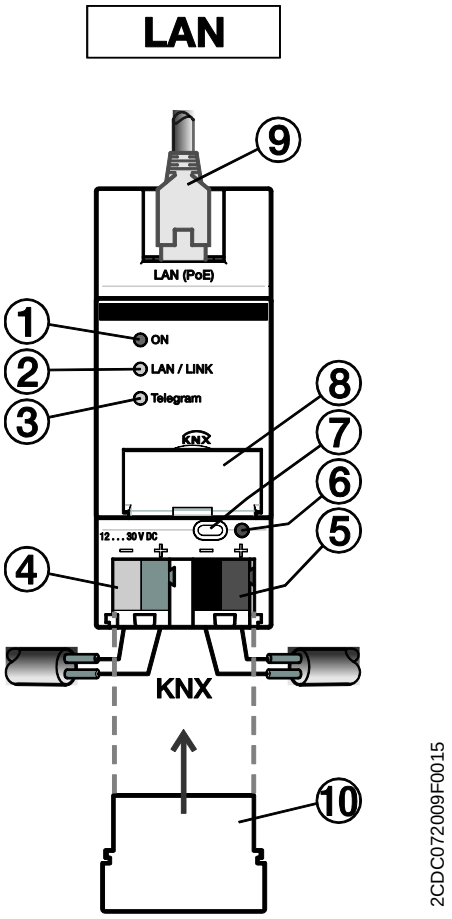
Design	Encliquetable sur rail DIN (MRD)	Appareil modulaire, design Pro*M*
	Dimensions	90 x 36 x 64 mm (H x L x P)
	Largeur de montage	2 modules de 18 mm
	Profondeur de montage	68 mm
Montage	Sur rail 35 mm	Selon DIN EN 60 715
Sens de montage	Indifférent	
Poids	0,1 kg	
Coffret, couleur	Plastique, sans halogène, gris	
Homologation	KNX selon EN 50 090-1, -2	
Sigle CE	Conforme aux directives CEM et basse tension	

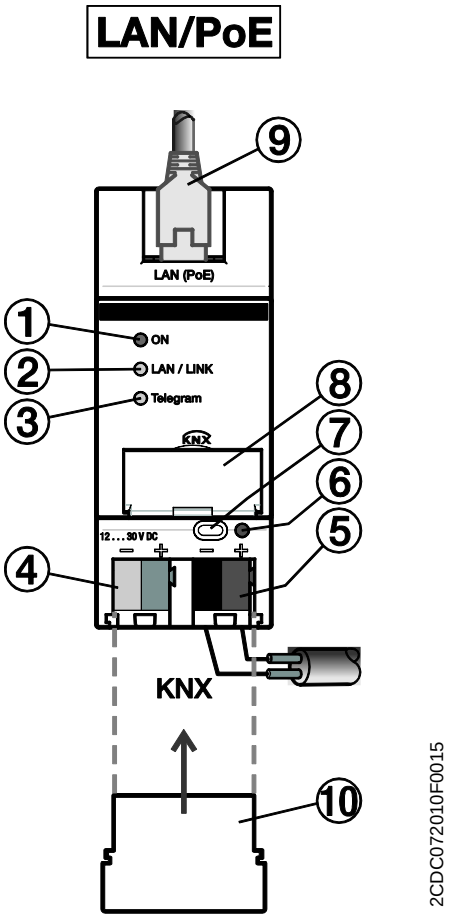
Type d'appareil	Application	Nombre maximum d'objets de communication	Nombre maximum d'adresses de groupe	Nombre maximum d'affectations
IPR/S 3.1.1	Routeur IP/…*	0	0	0

* … = numéro de la version actuelle de l'application. Pour plus de détails, veuillez consulter les informations relatives à l'application sur notre site Internet**.**

Remarque
ETS et la dernière version de l'application de l'appareil sont nécessaires pour la programmation de l'appareil. La dernière version de l'application ainsi que les informations correspondantes peuvent être téléchargées en ligne sur *www.abb.com/knx.* Après l'importation dans ETS, vous trouverez l'application dans la fenêtre *Catalogues* sous *Fabricants/ABB/Appareils système/Coupleur.* L'appareil ne prend pas en charge la fonction de fermeture d'un appareil KNX dans l'ETS. L'interdiction d'accès à tous les appareils d'un projet au moyen d'une *clé BCU* n'a aucun effet sur cet appareil. Celui-ci peut encore être lu et programmé.

2.2 Schéma de raccordement

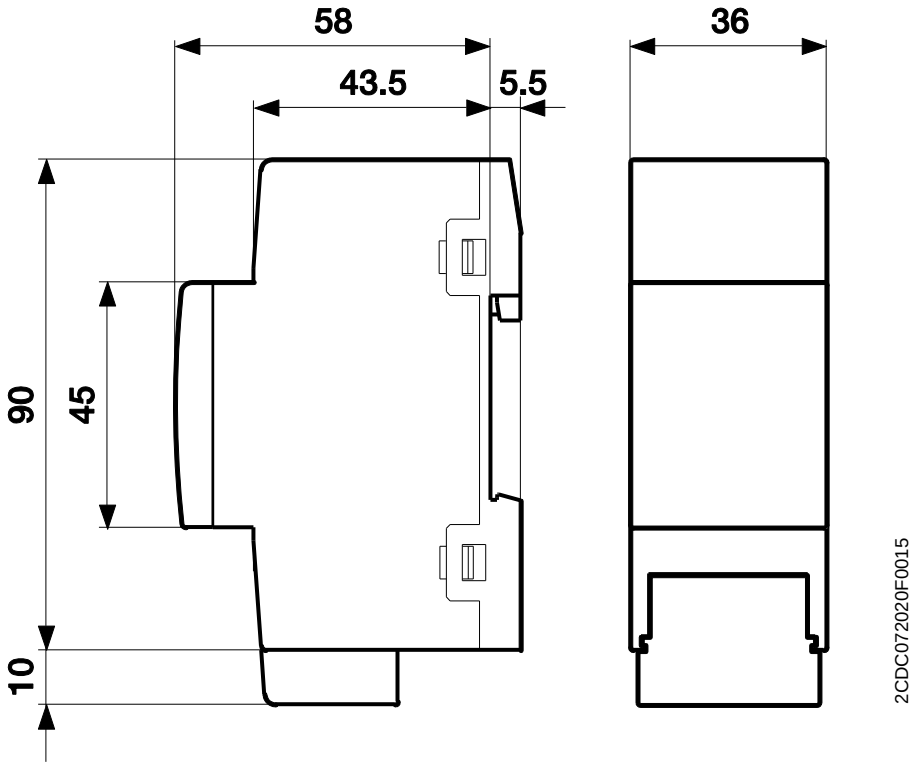




IPR/S 3.1.1

1 LED *ON*
2 LED *LAN/LINK*
3 LED *Telegram*
4 Raccord d'alimentation en tension
5 Connexion KNX
6 LED *Programmation*
7 Bouton *Programmation*
8 Porte-étiquette
9 Connexion LAN ou LAN/PoE
10 Couvercle

2.3 Plan coté



IPR/S 3.1.1

2.4 Montage et installation

L'appareil est encliquetable sur rail DIN de 35 mm selon DIN EN 60 715, destiné à être monté rapidement dans un coffret de distribution.

L'appareil peut être monté dans n'importe quelle position.

Le raccordement au bus est réalisé via la borne de raccordement du bus fournie. Les bornes sont identifiées sur le boîtier.

L'appareil est prêt à fonctionner dès le raccordement de la tension du bus et de la tension auxiliaire.

L'accessibilité de l'appareil pour le fonctionnement, la supervision, l'entretien et la réparation doit être assurée selon la norme DIN VDE 0100-520.

Conditions de mise en service

La mise en service de l'appareil nécessite un PC avec le programme ETS (ETS 3 V3.0f ou ultérieure) ainsi qu'une tension d'alimentation de 12 à 30 V CC. L'appareil peut également être alimenté via tension par câble Ethernet (Power over Ethernet - PoE).

L'appareil est prêt à fonctionner dès l'application de la tension du bus et de la tension auxiliaire.

L'installation et la mise en service ne doivent être effectuées que par des électriciens qualifiés. Lors de la planification et de la construction d'installations électriques, d'installations relatives à la sécurité, les intrusions et la protection incendie, les normes, directives, réglementations et dispositions pertinentes en vigueur dans le pays concerné doivent être respectées.

- Protéger l'appareil contre la poussière, l'humidité et les risques de dommages lors du transport, du stockage et de l'utilisation !
- N'utiliser l'appareil que dans le cadre des données techniques spécifiées !
- N'utiliser l'appareil que dans un boîtier fermé (coffret) !
- L'appareil doit être mis hors tension avant les travaux de montage.

Danger

En cas de modification ou d'extension de l'installation, il est indispensable de mettre hors tension tous les équipements de l'installation afin d'éviter tout risque de contact avec un élément ou un conducteur sous tension.

État à la livraison

L'appareil est livré avec l'adresse physique 15.15.0 et 5 autres adresses physiques 15.15.100 de connexion de tunneling.

L'adresse IP est paramétrée en mode attribution automatique (DHCP/AutoIP).

Remarque

L'appareil est livré avec l'option *Transmettre* configurée en usine. Ce réglage n'est pas un réglage par défaut dans l'application, mais il facilite la mise en service.

Le réglage paramétré est appliqué après le premier téléchargement.

Affectation de l'adresse physique

L'affectation et la programmation des adresses physiques et des paramètres sont effectuées dans ETS.

L'appareil dispose d'un bouton *Programmation p*our l'affectation de l'adresse physique. Après actionnement du bouton, la LED rouge *Programmation* s'allume. Elle s'éteint dès qu'ETS a affecté l'adresse physique ou que le bouton *Programmation* est actionné à nouveau.

Comportement lors du téléchargement

L'appareil peut être programmé de différentes façons : via l'un des serveurs de tunneling intégrés (« téléchargement local »), via routage KNXnet/IP ou via une autre interface de programmation (USB ou IP).

Pour que l'appareil puisse être programmé, celui-ci doit être connecté au KNX TP (Twisted Pair).

Environ 10 secondes après la fin du téléchargement, l'appareil redémarre et ferme toutes les connexions de tunneling ouvertes. Si l'adresse IP de l'appareil a été changée lors du téléchargement, les connexions de tunneling doivent être configurées manuellement dans les clients de tunneling. Les clients de tunneling établissent la connexion avec le serveur via l'adresse IP.

Les données paramétrées avec ETS sont transférées de 30 à 60 secondes après le téléchargement.

Nettoyage

L'appareil doit être mis hors tension avant le nettoyage. Les appareils encrassés peuvent être nettoyés avec un chiffon sec ou un chiffon humidifié dans de l'eau savonneuse. L'usage d'agents caustiques ou de solvants est absolument proscrit.

Maintenance

L'appareil ne nécessite aucun entretien. En cas de dommages provoqués par exemple pendant le transport ou le stockage, aucune réparation ne doit être effectuée.

2.5 Description des entrées et des sorties

Entrée de tension d'alimentation 12 à 30 V CC

Seule une tension continue de 12 à 30 V doit être raccordée à l'entrée de tension d'alimentation. Nous recommandons d'utiliser les modules d'alimentation NT/S de notre gamme de produits

Attention
La tension d'alimentation doit être entre 12 et 30 V CC, ou l'appareil doit être alimenté via tension par câble Ethernet (Power over Ethernet - PoE) conformément à la norme IEEE 802.3af classe 1. Le raccordement d'une tension de 230 V peut détruire l'appareil !

Raccordement KNX

L'appareil est raccordé au bus KNX à l'aide de la borne de raccordement de bus fournie.

Remarque
ETS 3 version 3.0f ou ultérieure est nécessaire pour la programmation de l'appareil.

Connexion LAN

La connexion au réseau s'effectue via une interface Ethernet RJ45 pour réseaux LAN. L'interface réseau peut être utilisée à une vitesse de transmission de 10/100 Mbit/s. La LED LAN/LINK située à l'avant du boîtier indique l'activité réseau.

2.6 Éléments de commande

Le routeur IP ne dispose d'aucun élément de commande.

2.7 Éléments d’affichage

La face avant de l'IPR/S est muni de trois LED d'affichage :

ON LAN/LINK Telegram

ON

- La LED s'allume pendant quelques secondes après l'enclenchement de la tension d'alimentation.
- La LED s'allume en continu après l'enclenchement de la tension d'alimentation.
  Après env. 40 secondes, la LED commence à clignoter jusqu'à la fin du processus de démarrage, après quoi elle s'allume à nouveau en continu. Cette opération peut prendre de 5 à 60 secondes selon la taille de la table de filtrage.

LAN/LINK

- La LED s'allume lorsque la tension auxiliaire est présente et que le routeur est connecté à un réseau Ethernet.
- La LED clignote lorsque l'appareil détecte une activité sur le réseau, p. ex. lors d'échanges de données.

Telegram

- La LED clignote lorsque le routeur est connecté à un réseau TP et que le processus de démarrage (voir LED « On ») est terminé.
- La LED clignote lorsque l'appareil détecte une activité sur la sous-ligne KNX TP1 (Twisted Pair 1), p. ex. lors d'échanges de données.

3 Mise en service

Le paramétrage de l'IPR/S s'effectue à l'aide de l'application et du logiciel Engineering Tool Software ETS.

L'application se trouve sous *Fabricants/ABB/Appareils système/Coupleur*.

Le paramétrage nécessite un PC ou un ordinateur portable avec le logiciel ETS et une connexion KNX.

3.1 Aperçu

Le paramétrage du routeur IP s'effectue à l'aide du logiciel Engineering Tool Software ETS 3 version 3.0f ou ultérieure.

Certaines fonctions (Unicast) sont paramétrées via un outil distinct (i-bus® Tool).

Important
Les applications pour ETS 3 à partir de la version 3.0f et ETS 4 version 4.1.7 ou ultérieure divergent en raison des différents éventails de fonctions offertes. Voir Vue d'ensemble des versions, p. 6. Aucune conversion n'est possible.

Remarque
L'application *Routeur IP/2.0* n'est prise en charge par ETS 4 qu'à partir de la version 4.1.7 et par ETS 5 qu'à partir de la version 5.0.4.

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

3.2 Paramètres

Le chapitre suivant décrit les paramètres du routeur IP accessibles depuis les fenêtres de paramétrage.

Les fenêtres de paramétrage sont dynamiques, de sorte que, selon le paramétrage et la fonction des sorties, d'autres paramètres ou d'autres fenêtres de paramétrage sont déverrouillés.

Les valeurs par défaut des paramètres sont soulignées, p. ex. :

Options : Oui
Non

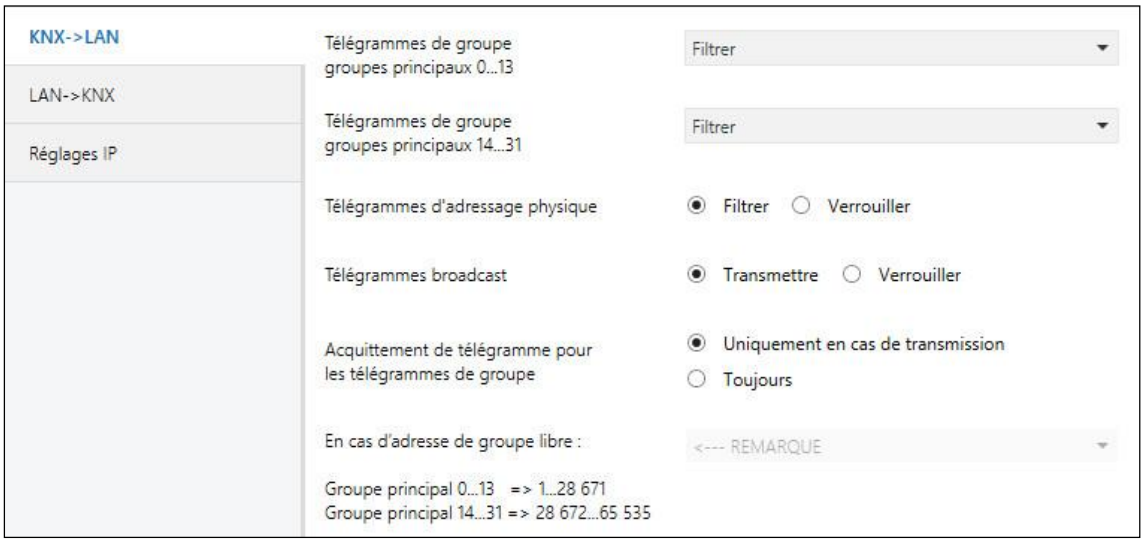
Remarque
Les captures d'écran ont été réalisées depuis ETS 5 et sont utilisées pour toutes les applications (ETS 3, ETS 4 et ETS 5). L'affichage peut varier légèrement. Les paramètres et les options sont identiques.

3.2.1 Application pour ETS 4 et ETS 5 (Routeur IP/2.0)

3.2.1.1 Fenêtre de paramétrage *KNX -> LAN*

La fenêtre de paramétrage *KNX -> LAN* permet de définir la façon dont les télégrammes envoyés depuis le système KNX vers le réseau LAN sont traités.

Remarque
L'appareil est livré avec l'option *Transmettre* configurée en usine. Ce réglage n'est pas un réglage par défaut dans l'application, mais il facilite la mise en service. Le réglage paramétré est appliqué après le premier téléchargement.



Télégrammes de groupe groupes principaux 0...13

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 0 à 13 doivent être filtrés, transmis ou verrouillés.

- *Filtrer* : Les télégrammes depuis le KNX vers le LAN avec les adresses de groupe des groupes principaux 0 à 13 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 0 à 13 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Tous les télégrammes de groupe depuis le KNX vers le LAN sont verrouillés sans prise en compte de la table de filtrage.

Télégrammes de groupe groupes principaux 14...31

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 14 à 31 doivent être filtrés, transmis ou verrouillés.

Remarque
ETS 4 version 4.1.7 ou ultérieure permet également de filtrer les groupes principaux 14…31. Pour cela, il est nécessaire d'utiliser l'application *Routeur IP/2.0*.

- *Filtrer* : Les télégrammes depuis le KNX vers le LAN avec les adresses de groupe des groupes principaux 14 à 31 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 14 à 31 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Aucun télégramme de groupe des groupes principaux 14 à 31 n'est transmis depuis le KNX vers le LAN.

Télégrammes d'adressage physique

Options : Filtrer
Verrouiller

Ce paramètre détermine si les télégrammes d'adressage physique sont filtrés ou verrouillés.

- *Filtrer* : Seuls les télégrammes depuis le KNX vers le LAN devant quitter la ligne de l'IPR/S vers le LAN sont transmis.
- *Verrouiller* : Les télégrammes d'adressage physique ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, il est impossible d'envoyer des télégrammes d'adressage physique depuis la ligne sous l'IPR/S sur une autre ligne, p. ex. lors de la programmation.

Télégrammes broadcast

Options : Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes broadcast sont transmis ou verrouillés.

- *Transmettre* : Les télégrammes broadcast sont transmis.
- *Verrouiller* : Les télégrammes broadcast ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, il est impossible d'envoyer des télégrammes broadcast depuis la ligne sous l'IPR/S sur une autre ligne, p. ex. lors de la programmation.

Acquittement de télégramme pour les télégrammes de groupe

Options : Uniquement en cas de transmission
Toujours

Ce paramètre détermine si les télégrammes de groupe des routeurs IP doivent être confirmés par un télégramme.

- *Uniquement en cas de transmission* : Les télégrammes de groupe ne sont confirmés (*Envoyer ACK*) que s'ils sont également transmis sur le LAN par le routeur IP. Ainsi, seuls les télégrammes qui figurent également dans la table de filtrage de l'IPR/S sont confirmés.
- *Toujours* : Tous les télégrammes de groupe sur le KNX sont confirmés par l'IPR/S.

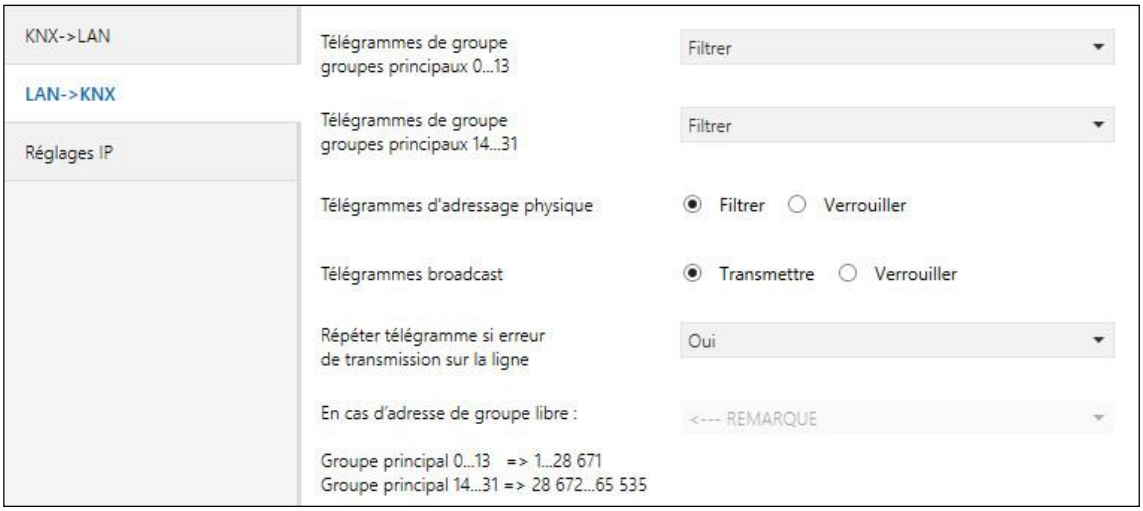
En cas d'adresse de groupe libre :

Groupe principal 0…13 => 1…28 671
Groupe principal 14…31 => 28 672…65 535

Remarque
ETS 4/ETS 5 permet d'affecter les adresses de groupe non pas en deux ou trois niveaux, mais librement. Lorsque la vue libre d'adresses de groupe est sélectionnée, le groupe principal 0…13 correspond à la plage de sous-groupe 1…28 671 et le groupe principal 14…31 correspond à la plage de sous-groupe 28 672…65 535. Vous trouverez plus de détails à ce sujet dans les rubriques d'aide d'ETS.

3.2.1.2 Fenêtre de paramétrage *LAN -> KNX*

La fenêtre de paramétrage LAN -> KNX permet de définir la façon dont les télégrammes envoyés depuis le réseau LAN vers le système KNX sont traités.



Télégrammes de groupe groupes principaux 0...13

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 0 à 13 doivent être filtrés, transmis ou verrouillés.

- *Filtrer* : Les télégrammes depuis le LAN vers le KNX avec les adresses de groupe des groupes principaux 0 à 13 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 0 à 13 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Tous les télégrammes de groupe depuis le LAN vers le KNX sont verrouillés sans prise en compte de la table de filtrage.

Télégrammes de groupe groupes principaux 14...31

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 14 à 31 doivent être filtrés, transmis ou verrouillés.

Remarque
ETS 4 version 4.1.7 ou ultérieure permet également de filtrer les groupes principaux 14…31. Pour cela, il est nécessaire d'utiliser l'application *Routeur IP/2.0*.

- *Filtrer* : Les télégrammes depuis le LAN vers le KNX avec les adresses de groupe des groupes principaux 14 à 31 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 14 à 31 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Aucun télégramme de groupe des groupes principaux 14 à 31 n'est transmis depuis le LAN vers le KNX.

Télégrammes d'adressage physique

Options : Filtrer
Verrouiller

Ce paramètre détermine si les télégrammes d'adressage physique sont filtrés ou verrouillés.

- *Filtrer* : Seuls les télégrammes depuis le LAN vers le KNX devant quitter la ligne de l'IPR/S vers le LAN sont transmis.
- *Verrouiller* : Les télégrammes d'adressage physique ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, il est impossible d'envoyer des télégrammes d'adressage physique depuis la ligne principale sur la ligne KNX TP, p. ex. lors de la programmation.

Télégrammes broadcast

Options : Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes broadcast sont transmis ou verrouillés.

- *Transmettre* : Les télégrammes broadcast sont transmis.
- *Verrouiller*: Les télégrammes broadcast ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, il est impossible d'envoyer des télégrammes broadcast depuis la ligne principale sur la ligne KNX TP, p. ex. lors de la programmation.

Répéter télégramme si erreur de transmission sur la ligne

Options : Oui
Non
Défini par l'utilisateur

- *Oui :* Lorsqu'une erreur est détectée lors de la transmission d'un télégramme, ce dernier est répété jusqu'à trois fois.
- *Non :* La transmission n'est pas répétée.
- *Défini par l'utilisateur :* Le comportement du système peut être paramétré séparément pour les différents types de télégrammes.

  Répéter télégrammes avec adresses de groupe

  Options : Oui
  Non

  - *Oui :* Lorsqu'une erreur est détectée lors de la transmission d'un télégramme avec une adresse de groupe, ce dernier est répété jusqu'à trois fois.
  - *Non :* La transmission n'est pas répétée.

  Répéter les télégrammes adressés physiquement

  Options : Oui
  Non

  - *Oui :* Lorsqu'une erreur est détectée lors de la transmission d'un télégramme adressé physiquement, ce dernier est répété jusqu'à trois fois.
  - *Non :* La transmission n'est pas répétée.

  Répéter télégrammes broadcast

  Options : Oui
  Non

  - *Oui :* Lorsqu'une erreur est détectée lors de la transmission d'un télégramme broadcast, ce dernier est répété jusqu'à trois fois.
  - *Non :* La transmission n'est pas répétée.

En cas d'adresse de groupe libre :

Groupe principal 0…13 => 1…28 671
Groupe principal 14…31 => 28 672…65 535

Remarque
ETS 4/ETS 5 permet d'affecter les adresses de groupe non pas en deux ou trois niveaux, mais librement. Lorsque la vue libre d'adresses de groupe est sélectionnée, le groupe principal 0…13 correspond à la plage de sous-groupe 1…28 671 et le groupe principal 14…31 correspond à la plage de sous-groupe 28 672…65 535. Vous trouverez plus de détails à ce sujet dans les rubriques d'aide d'ETS.

3.2.1.3 Fenêtre de paramétrage *Réglages IP*

La fenêtre de paramétrage *Réglages IP* permet de définir la façon dont le routeur IP communique sur le réseau IP.

Mode de communication IP

Options : Multicast
Unicast

Le mode de communication IP détermine le type de télégramme envoyé par le routeur IP sur le réseau IP.

- *Multicast* : Le mode communication KNXnet/IP défini par l'Association KNX pour les appareils IP KNX. Ce paramètre doit autant que possible être laissé intact et ne doit être modifié que si le réseau en place nécessite l'envoi de télégrammes Unicast.

  Pour plus d'informations sur la configuration de l'adresse Multicast de routage, voir Adresse Multicast de routage, p. 28.

- *Unicast* : Désactive le routage pour cet appareil.

  Ce mode de communication spécial n'est pas conforme aux spécifications KNXnet/IP.
  La configuration de ce paramètre s'effectue à l'aide de l'ABB i-bus® Tool.

Remarque
L'application pour ETS 4 ou ETS 5 ne permet aucune restriction de la plage d'adresses Multicast.

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

La remarque suivante s'affiche lorsque les options *Multicast* et *Unicast* sont sélectionnées :

**La configuration du nom de l'appareil,
de l'adresse IP et des serveurs de tunneling
s'effectue dans la fenêtre de propriétés d'ETS.**

D'autre part, la remarque suivante s'affiche lorsque l'option *Unicast* est sélectionnée :

Attention ! Ce réglage désactive le routage pour cet appareil. Les télégrammes IP seront désormais envoyés par connexion Unicast à un maximum de 9 adresses de destination.

La configuration Unicast s'effectue à l'aide de l'ABB i-bus® Tool.

Voir la description de la communication Unicast dans le chapitre Télégrammes KNX sur le réseau, p. 42.

L'i-bus® Tool peut être téléchargé gratuitement sur notre site (*www.abb.com/knx*).

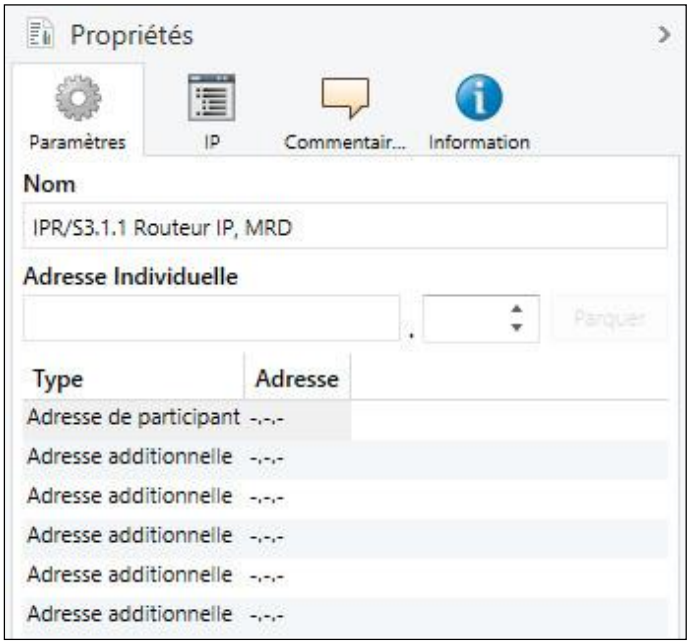
L'utilisation de l'i-bus® Tool ne requiert ni ETS ni l'installation de Falcon.

Configuration système requise : Système Windows version Windows 7 (Service Pack 3) ou ultérieure et .NET Framework 4.0.

La librairie intégrée Falcon 5.0 ne prend en charge que les interfaces USB et IP (RS232 non prise en charge).

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

La configuration des autres paramètres IP (nom de l'appareil, affectation de l'adresse IP par DHCP ou de manière fixe) s'effectue dans la fenêtre de propriétés correspondante d'ETS.



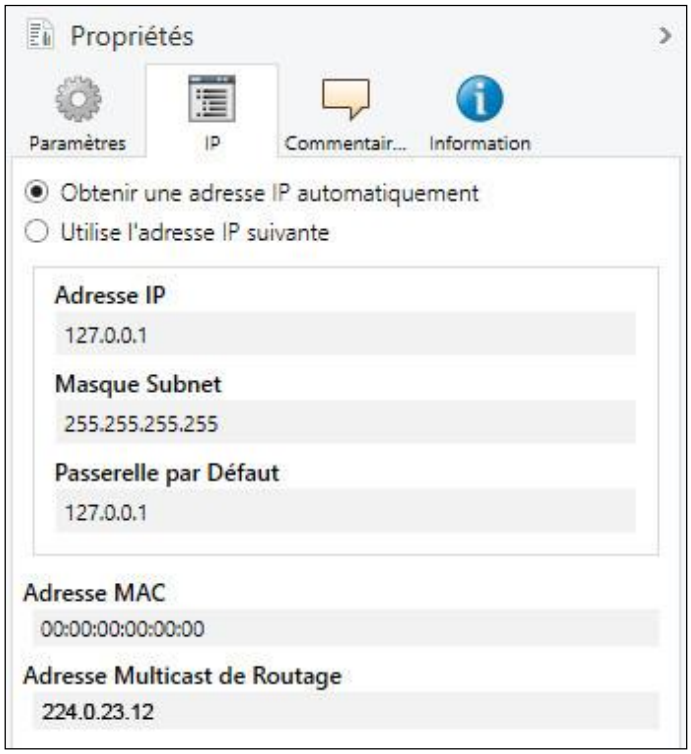
La fenêtre de propriétés *Paramètres* permet de définir le nom de l'appareil. Le champ *Nom* permet de modifier le nom chargé dans l'appareil.

Le nom de l'appareil sert à identifier celui-ci sur le réseau LAN. Lors d'une demande de recherche, p. ex. par ETS, chaque appareil KNXnet/IP signale son nom et peut être désigné par celui-ci. L'usage de noms comme IPR/S, EG, UV7 permet par exemple de communiquer le lieu d'installation de l'appareil.

Remarque
À la livraison, le nom d'appareil par défaut est « IP Router ». Le nom d'appareil défini dans la fenêtre de propriétés d'ETS n'est chargé dans l'appareil qu'après le premier téléchargement.

Attention
Seuls les 30 premiers caractères du nom d'appareil sont chargés. Les caractères restants sont ignorés.

La fenêtre de propriétés *IP* permet de définir l'adresse IP de l'appareil.



Les options suivantes sont disponibles pour la configuration de l'adresse IP :

Options : Obtenir une adresse IP automatiquement
Utilise l'adresse IP suivante

- *Obtenir une adresse IP automatiquement* : Selon le réglage par défaut, le routeur IP attend l'affectation d'une adresse IP par un serveur DHCP (dynamic host configuration protocol). Ce serveur attribue sur demande une adresse IP libre à l'appareil. Si aucun serveur DHCP n'est disponible sur le réseau ou que le serveur ne répond pas, l'appareil lance une procédure d'IP automatique. L'appareil s'auto-attribue une adresse dans la plage réservée aux adresses IP automatiques (169.254.xxx.yyy).

  Pour plus de détails sur le DHCP, voir le chapitre Affectation de l'adresse IP, p. 41.
- *Utilise l'adresse IP suivante* : Si le réseau ne dispose d'aucun serveur DHCP ou si l'adresse IP doit toujours être la même, celle-ci peut également être affectée de manière fixe.

Adresse IP

Options : 192.168.0.3

Masque de sous-réseau

Options : 255.255.255.0

Passerelle par défaut

Options : 192.168.0.1

Adresse MAC

Options : 00.00.00:00.00.00

Remarque
L'adresse Multicast de routage est seulement affichée ici. Pour plus d'informations sur la configuration de l'adresse Multicast de routage, voir Adresse Multicast de routage, p. 28.

Remarque
L'adresse MAC est lue depuis l'appareil après un téléchargement. L'adresse MAC est également transmise à l'appareil et peut aussi être détectée par l'i-bus® Tool.

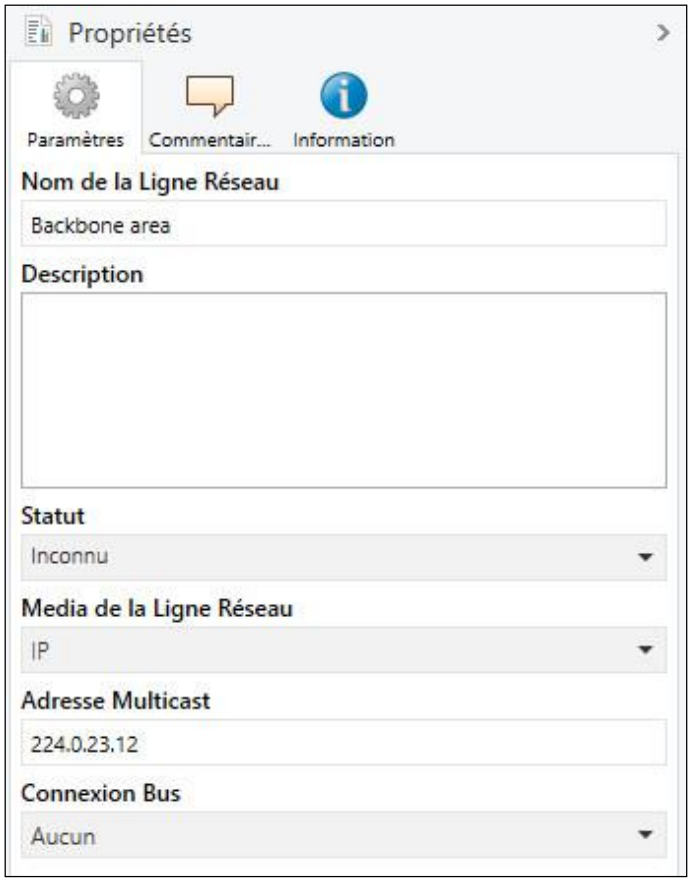
Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

Adresse Multicast de routage
(par défaut = 224.0.23.12)

Options : 224.0.23.12

L'adresse Multicast de routage définit l'adresse de destination des télégrammes IP de l'IPR/S. L'adresse prédéfinie 224.0.23.12 est l'adresse définie conjointement par l'Association KNX et l'IANA pour les appareils IP KNX. Cette adresse doit autant que possible être laissée intacte et ne doit être changée que si le réseau en place nécessite l'utilisation d'une adresse de la plage 224.0.0.0 à 239.255.255.255 (plage réservée aux adresses Multicast).

La configuration de l'adresse Multicast de routage s'effectue dans la fenêtre *Topologie* d'ETS (sélectionner d'abord la topologie, puis définir l'adresse Multicast de routage dans l'onglet *Paramètres* de la fenêtre de propriétés) :



Important
Tous les routeurs IP ou tous les autres appareils KNXnet/IP devant échanger des télégrammes sur le réseau IP doivent utiliser la même adresse Multicast de routage. Si des appareils ne devant échanger aucun télégramme sont utilisés sur le même réseau, ces appareils doivent utiliser une adresse Multicast de routage différente.

3.2.2 Application pour ETS 3 (Routeur IP/1.1)

3.2.2.1 Fenêtre de paramétrage *KNX -> LAN*

La fenêtre de paramétrage *KNX -> LAN* permet de définir la façon dont les télégrammes envoyés depuis le système KNX vers le réseau LAN sont traités.

Remarque
L'appareil est livré avec l'option *Transmettre* configurée en usine. Ce réglage n'est pas un réglage par défaut dans l'application, mais il facilite la mise en service. Le réglage paramétré est appliqué après le premier téléchargement.

Télégrammes de groupe groupes principaux 0...13

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 0 à 13 doivent être filtrés, transmis ou verrouillés.

- *Filtrer* : Les télégrammes depuis le KNX vers le LAN avec les adresses de groupe des groupes principaux 0 à 13 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 0 à 13 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Tous les télégrammes de groupe depuis le KNX vers le LAN sont verrouillés sans prise en compte de la table de filtrage.

Télégrammes de groupe groupes principaux 14...31

Options : Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 14 à 31 doivent être transmis ou verrouillés.

Comme ETS 3 ne calcule aucune table de filtrage pour les groupes principaux 14 à 31, ces adresses de groupe ne peuvent être que transmises ou verrouillées.

Remarque
ETS 4 version 4.1.7 ou ultérieure permet également de filtrer les groupes principaux 14…31. Pour cela, il est nécessaire d'utiliser l'application *Routeur IP/2.0*. Voir les descriptions de l'application pour ETS 4, chapitre Fenêtre de paramétrage KNX -> LAN, p. 17.

- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 14 à 31 sont transmis sans prise en compte de la table de filtrage.
- *Verrouiller* : Aucun télégramme de groupe des groupes principaux 14 à 31 n'est transmis depuis le KNX vers le LAN.

Télégrammes d'adressage physique et télégrammes broadcast

Options : Filtrer
Verrouiller

Ce paramètre détermine si les télégrammes d'adressage physique ou les télégrammes broadcast sont filtrés ou verrouillés.

- *Filtrer* : Seuls les télégrammes depuis le KNX vers le LAN devant quitter la ligne de l'IPR/S vers le LAN sont transmis.
- *Verrouiller* : Les télégrammes d'adressage physique et les télégrammes broadcast ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, il est impossible de programmer d'autres appareils de l'installation avec ETS depuis la ligne sous l'IPR/S.

Acquittement de télégramme pour les télégrammes de groupe

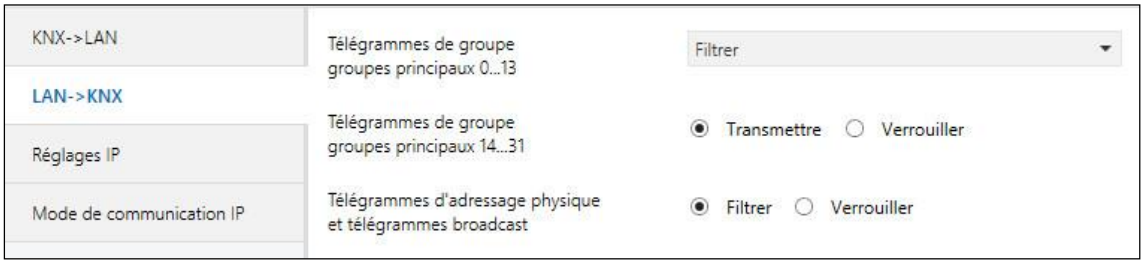
Options : Uniquement en cas de transmission
Toujours

Ce paramètre détermine si les télégrammes de groupe des routeurs IP doivent être confirmés par un télégramme.

- *Uniquement en cas de transmission* : Les télégrammes de groupe ne sont confirmés (*Envoyer ACK*) que s'ils sont également transmis sur le LAN par le routeur IP. Ainsi, seuls les télégrammes qui figurent également dans la table de filtrage de l'IPR/S sont confirmés.
- *Toujours* : Tous les télégrammes de groupe sur le KNX sont confirmés par l'IPR/S.

3.2.2.2 Fenêtre de paramétrage *LAN -> KNX*

La fenêtre de paramétrage LAN -> KNX permet de définir la façon dont les télégrammes envoyés depuis le réseau LAN vers le système KNX sont traités.



Télégrammes de groupe groupes principaux 0...13

Options : Filtrer
Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 0 à 13 doivent être filtrés, transmis ou verrouillés.

- *Filtrer* : Les télégrammes depuis le LAN vers le KNX avec les adresses de groupe des groupes principaux 0 à 13 sont filtrés selon la table de filtrage calculée automatiquement par ETS.
- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 0 à 13 sont transmis sans prise en compte de la table de filtrage.

Important
Ce paramètre n'est utile qu'à des fins de mise en service et de diagnostic. Il ne doit pas être utilisé lors du fonctionnement normal de l'appareil. Ce paramètre peut entraîner une surcharge de la ligne KNX et ainsi provoquer une perte de télégrammes.

- *Verrouiller* : Tous les télégrammes de groupe depuis le LAN vers le KNX sont verrouillés sans prise en compte de la table de filtrage.

Télégrammes de groupe groupes principaux 14...31

Options : Transmettre
Verrouiller

Ce paramètre détermine si les télégrammes avec les adresses de groupe des groupes principaux 14 à 31 doivent être transmis ou verrouillés.

Comme ETS 3 ne calcule aucune table de filtrage pour les groupes principaux 14 à 31, ces adresses de groupe ne peuvent être que transmises ou verrouillées.

Remarque
ETS 4 version 4.1.7 ou ultérieure permet également de filtrer les groupes principaux 14…31. Pour cela, il est nécessaire d'utiliser l'application *Routeur IP/2.0*. Voir les descriptions de l'application pour ETS 4, chapitre Fenêtre de paramétrage LAN -> KNX, p. 20.

- *Transmettre* : Tous les télégrammes de groupe des groupes principaux 14 à 31 sont transmis sans prise en compte de la table de filtrage.
- *Verrouiller* : Aucun télégramme de groupe des groupes principaux 14 à 31 n'est transmis depuis le LAN vers le KNX.

Télégrammes d'adressage physique et télégrammes broadcast

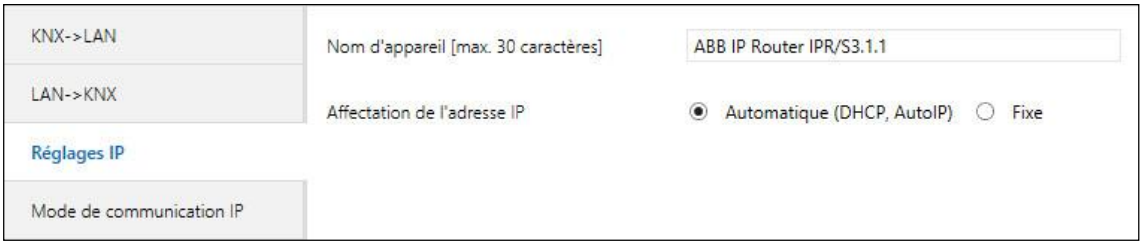
Options : Filtrer
Verrouiller

Ce paramètre détermine si les télégrammes d'adressage physique ou les télégrammes broadcast sont filtrés ou verrouillés.

- *Filtrer* : Seuls les télégrammes depuis le LAN vers le KNX devant être transmis sur la ligne sont envoyés.
- *Verrouiller* : Les télégrammes d'adressage physique et les télégrammes broadcast ne sont pas traités par l'IPR/S. Lorsque cette option est sélectionnée, les télégrammes d'adressage physique ou les télégrammes broadcast depuis le LAN vers le KNX sont verrouillés.

3.2.2.3 Fenêtre de paramétrage *Réglages IP*

La fenêtre de paramétrage *Réglages IP* permet d'effectuer tous les réglages IP du côté du routeur IP.



Nom d'appareil [max. 30 caractères]

Options : ABB IP Router IPR/S3.1.1

Le nom de l'appareil sert à identifier celui-ci sur le réseau LAN. Lors d'une demande de recherche, p. ex. par ETS, chaque appareil KNXnet/IP signale son nom et peut être désigné par celui-ci. L'usage de noms comme IPR/S, EG, UV7 permet par exemple de communiquer le lieu d'installation de l'appareil.

Le texte ne doit pas dépasser 30 caractères. Ce nom est également affiché lorsque l'appareil est détecté comme interface de communication dans ETS.

Remarque
À la livraison, le nom d'appareil par défaut est « IP Router ». Le nom d'appareil défini dans l'application n'est appliqué qu'après le premier téléchargement.

Pour plus d'informations, voir Utilisation des serveurs de tunneling intégrés, p. 38.

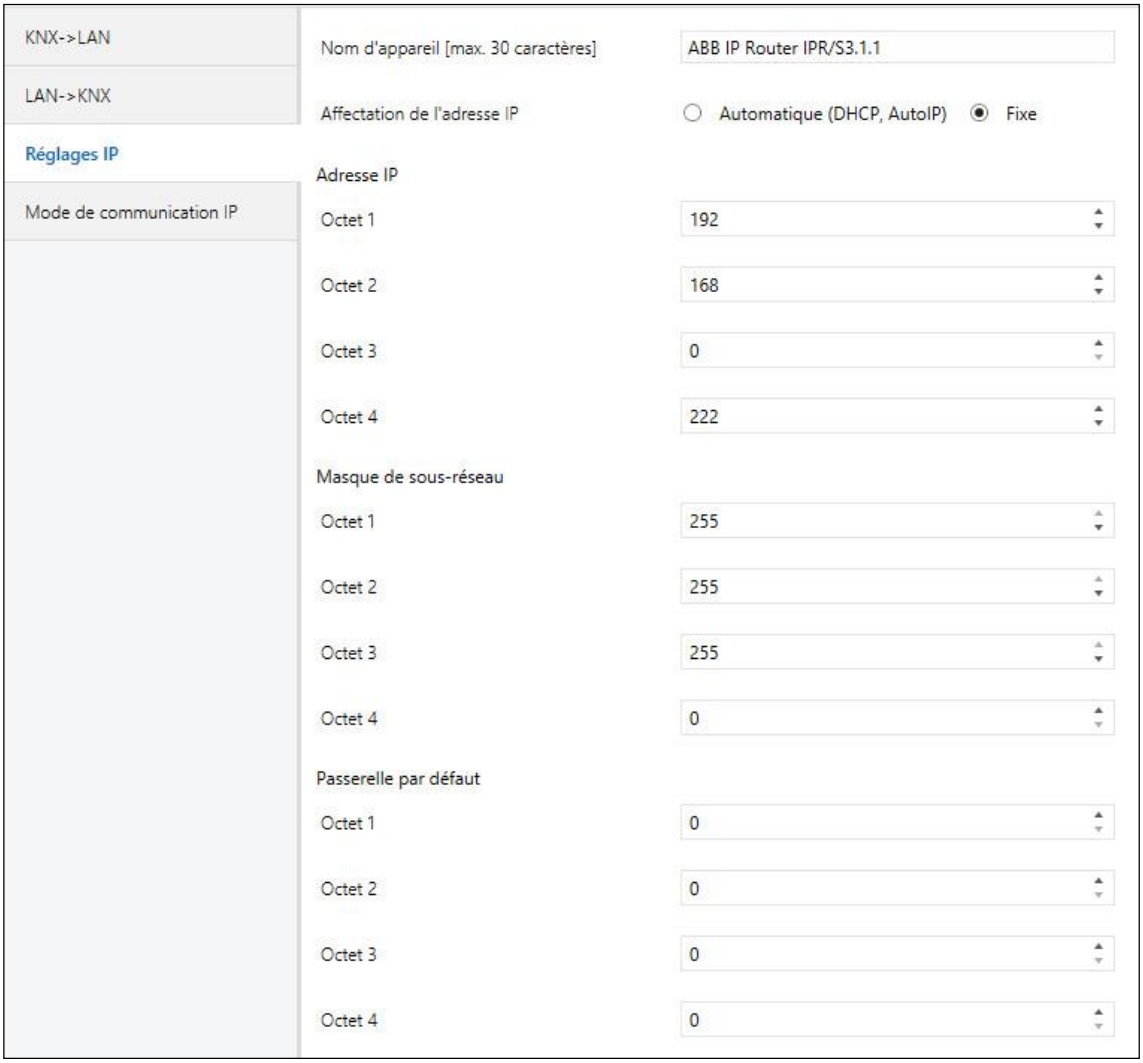
Affectation de l'adresse IP

Options : Automatique (DHCP, AutoIP)
Fixe

- *Automatique (DHCP, AutoIP)* : Avec le réglage par défaut, le routeur IP attend l'affectation d'une adresse IP par un serveur DHCP (dynamic host configuration protocol). Ce serveur attribue sur demande une adresse IP libre à l'appareil. Si aucun serveur DHCP n'est disponible sur le réseau ou que le serveur ne répond pas, l'appareil initie une procédure d'IP automatique. L'appareil s'auto-attribue une adresse dans la plage réservée aux adresses IP automatiques (169.254.xxx.yyy).
- *Fixe* : Si le réseau ne dispose d'aucun serveur DHCP ou si l'adresse IP doit toujours être la même, celle-ci peut également être affectée de manière fixe.

  La fenêtre de paramétrage s'agrandit pour afficher les paramètres de réglage de l'adresse IP.

Ces paramètres ne sont visibles que lorsque l'option *Fixe* est sélectionnée pour le paramètre *Affectation de l'adresse IP*.



Adresse IP

Octet x

Options : 0…255

L'adresse IP est l'adresse unique du routeur IP sur le LAN.

L'adresse doit être saisie par octet, p. ex. comme suit pour l'adresse 192.168.0.222 :

Octet 1 : 192
Octet 2 : 168
Octet 3 : 0
Octet 4 : 222

Masque de sous-réseau

Octet x

Options : 0…255

Le *masque de sous-réseau* détermine la classe du réseau. Le masque de sous-réseau doit être défini en fonction du nombre et de la structure des sous-réseaux. Dans le cas le plus simple, c.-à-d. sur un petit réseau, le masque de sous-réseau 255.255.255.0 doit être défini comme suit :

Octet 1 : 255
Octet 2 : 255
Octet 3 : 255
Octet 4 : 0

Passerelle par défaut

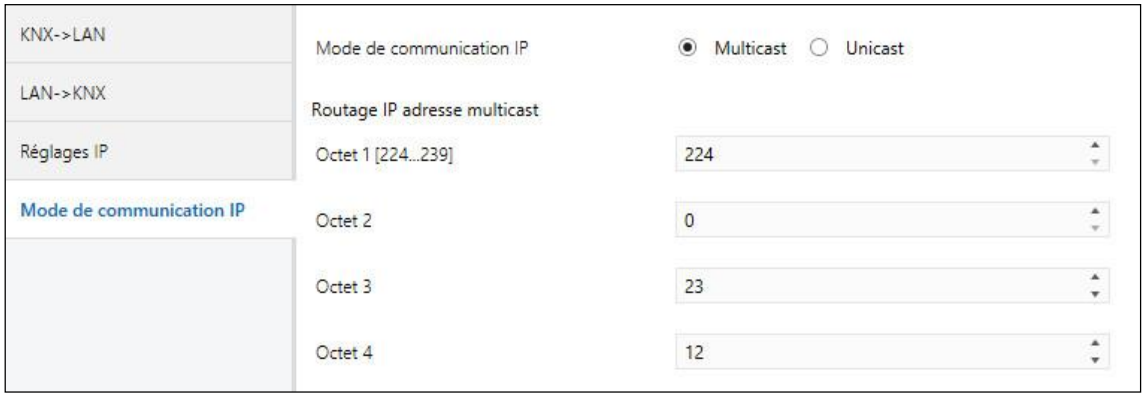
Octet x

Options : 0…255

Le paramètre *Passerelle par défaut* indique le point de connexion par lequel les télégrammes IP doivent être transmis, p. ex. l'adresse IP d'un routeur entre des réseaux. Ces passerelles n'existent que sur les plus grands réseaux. Pour les petits réseaux, le paramètre 0.0.0.0 peut être conservé.

3.2.2.4 Fenêtre de paramétrage *Mode de communication IP (Multicast)*

Cette fenêtre de paramétrage permet de configurer le mode de communication IP *Multicast*.



Mode de communication IP

Options : Multicast
Unicast

Le mode de communication IP détermine le type de télégramme envoyé par le routeur IP sur le réseau IP.

- *Multicast* : Le mode communication KNXnet/IP défini par l'Association KNX pour les appareils IP KNX. Ce réglage doit autant que possible être laissé intact et ne doit être modifié que si le réseau en place nécessite l'envoi de télégrammes par connexion Unicast.
- *Unicast* : Désactive le routage pour cet appareil.

  Ce mode de communication spécial n'est pas conforme aux spécifications KNXnet/IP. La configuration de ce paramètre s'effectue à l'aide de l'ABB i-bus® Tool.

Routage IP adresse Multicast

Octet 1 [224…239]

Options : 224…239

Octet 2, 3, 4

Options : 0…255

L'adresse Routage IP Multicast définit l'adresse de destination des télégrammes de l'IPR/S. L'adresse prédéfinie 224.0.23.12 est l'adresse définie conjointement par l'Association KNX et l'IANA pour les appareils IP KNX. Cette adresse doit autant que possible être laissée intacte et ne doit être modifiée que si le réseau en place nécessite l'utilisation d'une autre adresse.

Important
Tous les routeurs IP ou tous les autres appareils KNXnet/IP devant échanger des télégrammes sur le réseau IP doivent utiliser la même adresse Multicast de routage. Si des appareils ne devant échanger aucun télégramme sont utilisés sur le même réseau, ces appareils doivent utiliser une adresse Multicast de routage différente.

3.2.2.5 Fenêtre de paramétrage *Mode de communication IP (Unicast)*

La remarque suivante s'affiche lorsque l'option *Unicast* est sélectionnée :

Attention ! Ce réglage désactive le routage pour cet appareil. Les télégrammes IP seront désormais envoyés par connexion Unicast à un maximum de 9 adresses de destination.

La configuration Unicast s'effectue à l'aide de l'ABB i-bus® Tool.

Voir la description de la communication Unicast dans le chapitre Télégrammes KNX sur le réseau, p. 42.

L'i-bus® Tool peut être téléchargé gratuitement sur notre site (*www.abb.com/knx*).

L'utilisation de l'i-bus® Tool ne requiert ni ETS ni l'installation de Falcon.

Configuration système requise : Système Windows version Windows 7 (Service Pack 3) ou ultérieure et .NET Framework 4.0.

La librairie intégrée Falcon 5.0 ne prend en charge que les interfaces USB et IP (RS232 non prise en charge).

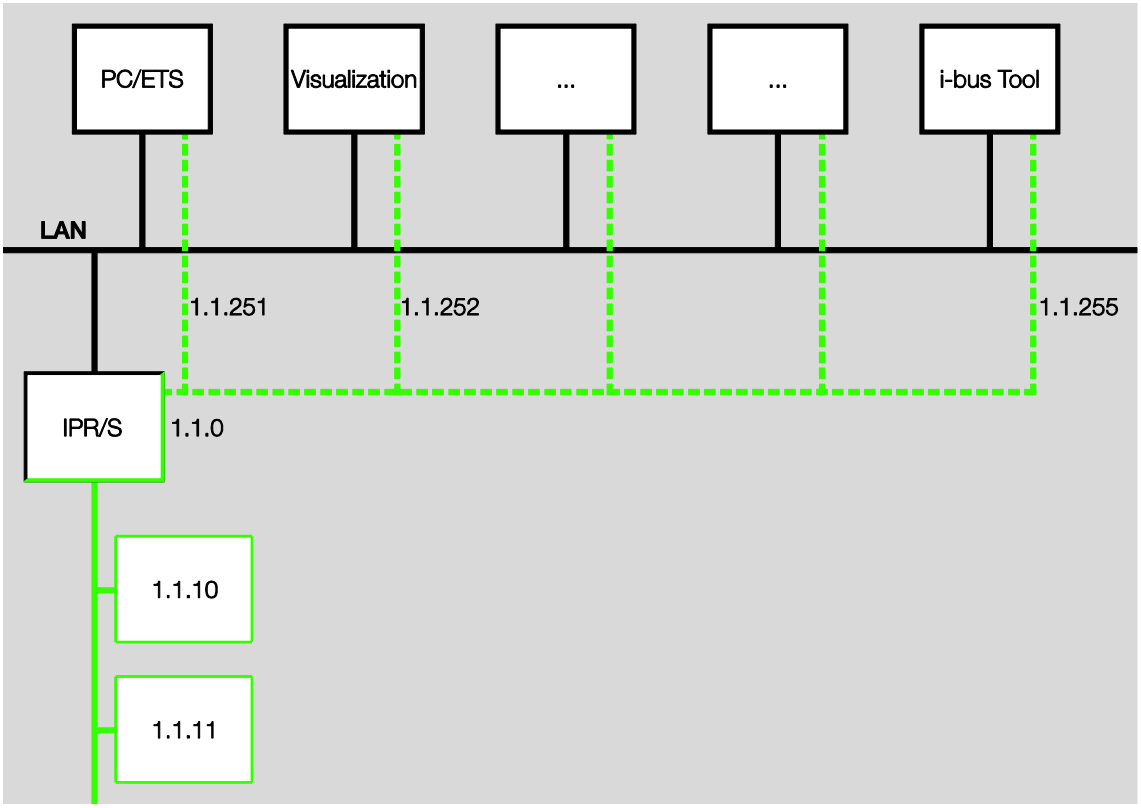
Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

3.3 Objets de communication

Le routeur IP IPR/S n'a aucun objet de communication KNX.

3.4 Utilisation des serveurs de tunneling intégrés

Le routeur IP offre 5 adresses physiques supplémentaires pouvant être utilisées pour une connexion de tunneling. Ces soi-disant serveurs de tunneling peuvent être utilisés avec ETS comme interface de programmation ou encore avec un autre client, p. ex. un programme de visualisation.



Lors du tunneling, un client se connecte à une ligne de bus. Le processus de tunneling utilise le protocole UDP, mais conserve une couche de liaison de données afin que les télégrammes soient répétés en cas d'erreur.

Remarque
L'adresse physique pour la connexion de tunneling doit correspondre à la topologie. C'est pourquoi les adresses doivent être choisies dans la plage d'adresses de la ligne subordonnée. À la livraison de l'appareil, tous les serveurs de tunneling ont l'adresse 15.15.100. Le paramétrage des connexions de tunneling dépend de la version d'ETS utilisée. • Dans ETS 4 et ETS 5, les 5 premières adresses libres de la ligne sont affectées une fois le routeur ajouté sur une ligne. • Dans ETS 3, une seule connexion de tunneling est disponible.

3.4.1 Paramètres dans ETS 4/ETS 5

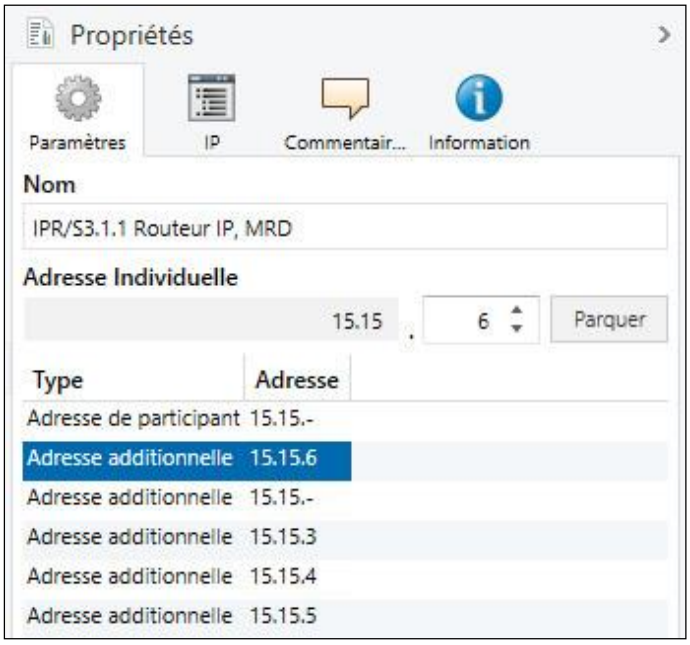
Dans ETS 4 ou toute version ultérieure, une fenêtre de propriétés supplémentaire est disponible pour la configuration des autres adresses physiques (à partir de l'application *Routeur IP/2.0*).

Après l'ajout du routeur sur la ligne, ETS réserve automatiquement les 5 premières adresses libres de cette ligne pour les serveurs de tunneling du routeur (ETS 4 et ETS 5). Il s'agit là d'une fonction de base d'ETS qui ne peut pas être modifiée.

Bien que les 5 adresses par défaut à la livraison soient 15.15.100, les adresses sont remplacées par les premières adresses libres dans le projet après le premier téléchargement.

Si ce réglage n'est pas désiré, il est possible de le modifier manuellement dans la fenêtre de propriétés.

Modification de l'adresse



Pour modifier l'adresse, surligner l'adresse actuelle de l'appareil ou l'adresse supplémentaire et cliquer sur la flèche vers le haut ou la flèche vers le bas pour sélectionner le chiffre souhaité. L'adresse modifiée est enregistrée lorsque vous surlignez une autre adresse.

Les adresses modifiées ne sont appliquées qu'après un téléchargement.

Parquer

Lorsque l'option *Parquer* est activée pour un tunnel, ce tunnel n'est pas utilisé.

Si l'option *Parquer* est sélectionnée pour tous les serveurs de tunneling, ceux-ci reçoivent tous l'adresse 15.15.255. Un seul serveur de tunneling est alors disponible.

3.4.2 Paramètres dans ETS 3

Dans ETS 3, l'affectation d'une adresse physique supplémentaire s'effectue via l'élément de menu *Extras* → *Options* → *Communication* → *Paramètres*.

4 Planification et mise en œuvre

4.1 Le routeur IP sur le réseau

Le routeur IP est conçu pour l'utilisation sur les réseaux 10/100BaseT conformes à la norme IEEE 802.3. L'appareil dispose d'une fonction de détection automatique et définit automatiquement la vitesse de transmission (10 ou 100 Mbit).

4.1.1 Affectation de l’adresse IP

DHCP/AutoIP

L'adresse IP peut être attribuée par un serveur DHCP. Pour cela, l'affectation automatique de l'adresse IP doit être configurée dans ETS, voir Fenêtre de paramétrage Réglages IP, p. 23 (pour l'application *Routeur IP/2.0*) ou Fenêtre de paramétrage Réglages IP, p. 33 (pour l'application *Routeur IP/1.1*). Si aucun serveur DHCP n'est trouvé alors que cette option est sélectionnée, l'appareil lance une procédure AutoIP et s'auto-attribue une adresse dans la plage 169.254.xxx.yyy.

L'appareil conserve l'adresse IP qu'il reçoit au démarrage (par DHCP ou AutoIP) jusqu'au prochain redémarrage (mise hors tension/sous tension ou reprogrammation) ou jusqu'à ce qu'un serveur DHCP soit disponible.

Si aucun serveur DHCP n'est disponible au démarrage :

Si aucun serveur DHCP n'est disponible au démarrage du routeur IP, l'appareil s'auto-attribue une adresse AutoIP. Le routeur cherche ensuite un serveur DHCP de manière cyclique (3 télégrammes à intervalles de 3 secondes suivis d'une pause de 20 secondes). Dès qu'un serveur est à nouveau disponible, l'adresse affectée par le serveur DHCP est utilisée.

Le serveur DHCP cesse de fonctionner (l'appareil a déjà reçu une adresse IP du DHCP) :

Les demandes de prolongation des droits d'utilisation de cette adresse IP demeurent sans réponse jusqu'à la fin de la durée du bail (la période de validité de l'adresse IP est définie par le serveur DHCP lors de l'affectation). Le routeur continue d'utiliser la même adresse IP.

À la fin de la durée du bail ou après un téléchargement, les appareils s'auto-attribuent une adresse AutoIP.

Adresse IP fixe

Si l'adresse IP de l'IPR/S doit être affectée de manière fixe, il est possible de définir une adresse IP fixe (ainsi qu'un masque de sous-réseau et une passerelle par défaut) dans ETS. Voir Fenêtre de paramétrage Réglages IP, p. 23 (pour l'application *Routeur IP/2.0*) ou Fenêtre de paramétrage Réglages IP, p. 33 (pour l'application *Routeur IP/1.1*).

4.1.2 Télégrammes KNX sur le réseau (routage)

Remarque
Lors de la conception du système KNX, veuillez prendre en considération le fait que le nombre de télégrammes transmis est limité, même avec l'utilisation d'un routeur IP. De par la nature du système, la vitesse de transmission IP élevée (10/100 Mbit/s) peut engendrer des pertes de télégrammes sur la ligne TP1 (9,6kbit/s) en cas de trafic de données important.

Remarque
Pendant une saturation IP, TCP ou UDP (accès depuis Internet), le routeur IP est inaccessible. Tous les services deviennent à nouveau disponibles dès la fin de la saturation. Afin d'éviter cette réaction du système, un débit maximal doit être configuré au niveau du réseau. Veuillez consulter votre administrateur réseau à ce sujet.

Multicast

Le routeur IP envoie des télégrammes depuis le KNX sur le réseau IP conformément aux spécifications du protocole KNXnet/IP. Selon le réglage par défaut, ces télégrammes sont envoyés sous forme de télégrammes Multicast sur l'adresse IP Multicast 224.0.23.12 port 3671. Cette adresse IP Multicast est l'adresse définie conjointement par l'Association KNX et l'IANA pour les appareils IP KNX. Cette adresse doit autant que possible être laissée intacte et ne doit être modifiée que si le réseau en place nécessite l'utilisation d'une autre adresse.

Pour que plusieurs routeurs IP puissent communiquer entre eux, une communication Multicast doit être possible entre les appareils.

Selon le type de réseau et la configuration des composants réseau utilisés, p. ex. un routeur, un commutateur ou un pare-feu, l'adresse IP Multicast 224.0.23.12 doit possiblement être déverrouillée de manière explicite.

Veuillez consulter votre administrateur réseau à ce sujet.

Multicast désigne la communication d'un émetteur avec un groupe de récepteurs. Le routeur IP envoie les paquets de télégrammes KNX sous forme de télégrammes UPD/IP sur le réseau IP et tous les routeurs IP avec la même adresse Multicast reçoivent ce télégramme et le traitent.

Si un télégramme est adressé à la sous-ligne correspondante, le routeur achemine le télégramme vers la ligne. Sinon, le télégramme est rejeté.

Pour plus d'informations, voir :
Pour ETS 4/ETS 5 : **Fenêtre de paramétrage Réglages IP, p. 23.**
Pour ETS 3 : **Fenêtre de paramétrage Mode de communication IP (Multicast), p. 36.**

Unicast

Si aucune communication Multicast n'est possible sur un réseau, les routeurs IP ABB peuvent également communiquer entre eux via liaison Unicast. Jusqu'à 10 routeurs IP ABB peuvent être regroupés dans un groupe Unicast. 9 adresses IP sont alors attribuées à chaque routeur pour l'envoi de ses télégrammes.

Unicast désigne généralement la communication entre un émetteur et un récepteur. Le routeur établit alors une liaison de communication avec chaque routeur IP de son groupe Unicast.

La configuration de ce groupe Unicast s'effectue facilement et automatiquement à l'aide de l'ABB i-bus® Tool.

Il est également possible de lier un client (p. ex. un programme de visualisation) à ce groupe Unicast. Dans ce cas, l'une des 10 adresses Unicast est réservée et 9 routeurs IP peuvent encore être liés.

Vous trouverez une description complète du fonctionnement de la configuration à l'aide de l'i-bus® Tool dans les rubriques d'aide de l'i-bus® Tool (voir chapitre L'i-bus® Tool, p. 47).

Remarque
La fonction *Multicast* est désactivée dès la sélection de l'option *Unicast* dans la fenêtre de paramétrage Mode de communication IP d'ETS. Les appareils ne peuvent alors plus être programmés par routage Multicast, mais seulement via l'un des serveurs de tunneling intégrés ou via une interface de programmation séparée.

Pour plus d'informations, voir :
Pour ETS 4/ETS 5 : Fenêtre de paramétrage Réglages IP, p. 23.
Pour ETS 3 : Fenêtre de paramétrage Mode de communication IP (Unicast), p. 37.

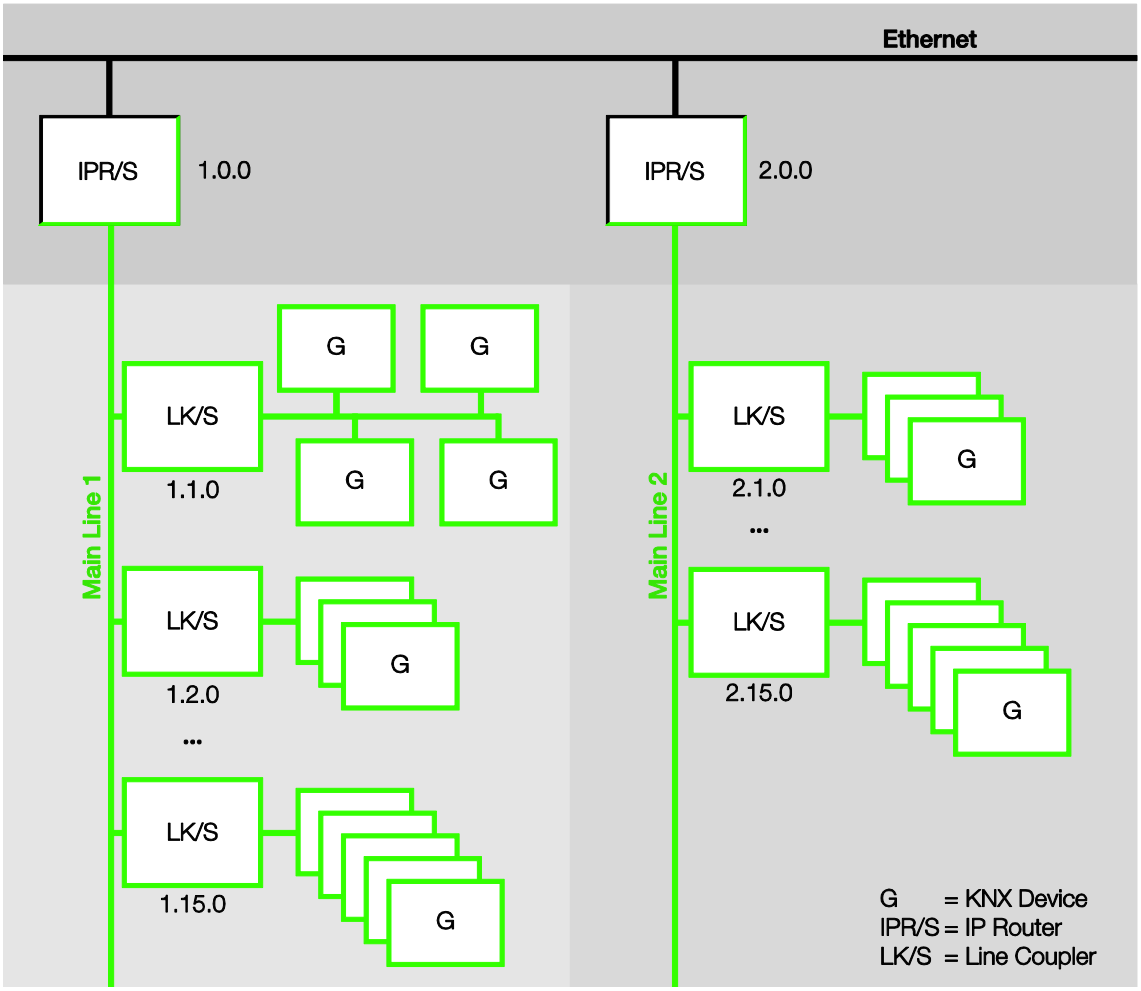
Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

Remarque
• Si vous utilisez le mode de communication Unicast, vous devez vous assurer que l'adresse IP du routeur ne soit pas modifiée pendant le fonctionnement de l'appareil. À cet effet, vous devez soit affecter une adresse IP fixe, soit configurer le serveur DHCP de manière appropriée. • À partir de la version de l'application Routeur IP/2.0, ETS réactualise également tous les paramètres IP en cas de changement de l'adresse physique. C'est-à-dire que même si seulement l'option *Programmation adresse physique* est sélectionnée dans ETS, le nom de l'appareil, l'adresse Multicast, le mode de communication IP(DHCP, AutoIP, fixe), l'adresse IP, le masque de sous-réseau, la passerelle par défaut et toutes les adresses de tunneling sont chargées à nouveau. Il est alors nécessaire de reconfigurer la communication Unicast à l'aide de l'i-bus® Tool.

4.1.3 IPR/S comme coupleur de zone

Le routeur IP peut servir de coupleur de zone dans les installations KNX. Pour ce faire, l'adresse physique d'un coupleur de zone (1.0.0…15.0.0) doit être affectée au routeur. Un projet ETS permet la création de 15 zones avec des coupleurs de zone.

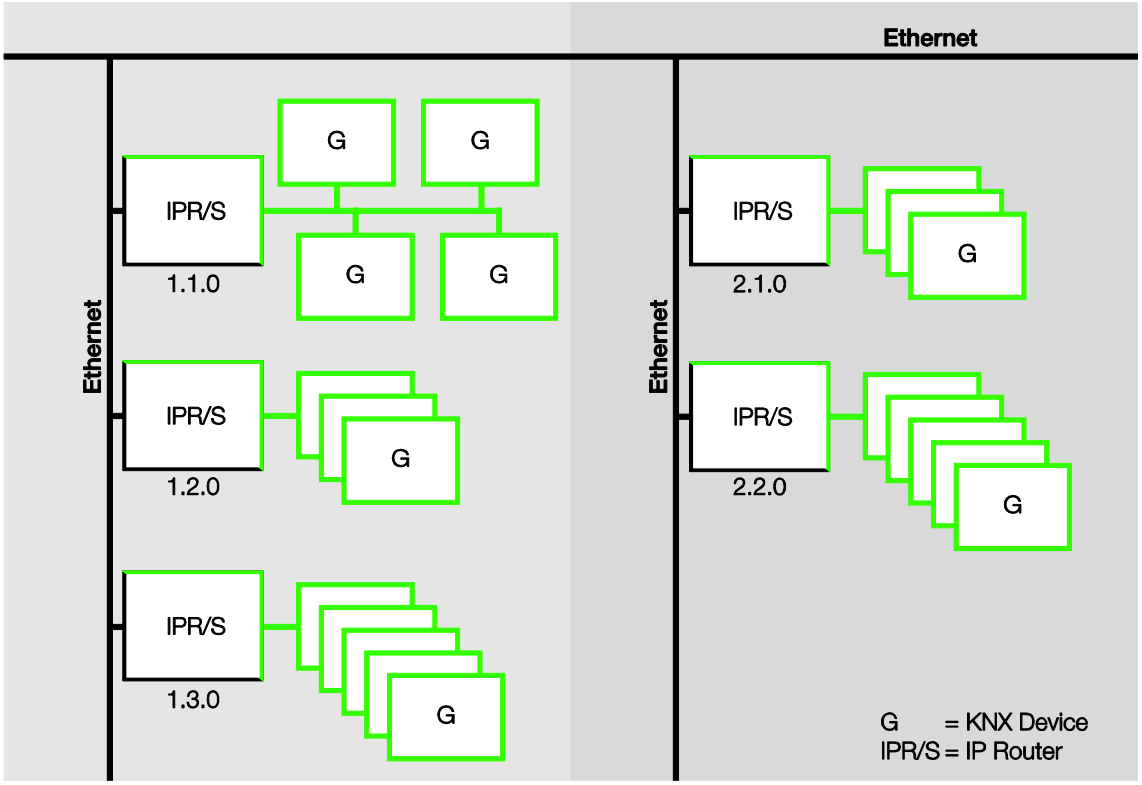
Le schéma ci-dessous illustre cette topologie avec des routeurs IP servant de coupleurs de zone et de coupleurs de ligne KNX (LK/S).



4.1.4 IPR/S comme coupleur de ligne

Le routeur IP peut servir de coupleur de ligne dans les installations KNX. Pour ce faire, l'adresse physique d'un coupleur de ligne (1.1.0…15.15.0) doit être affectée au routeur.

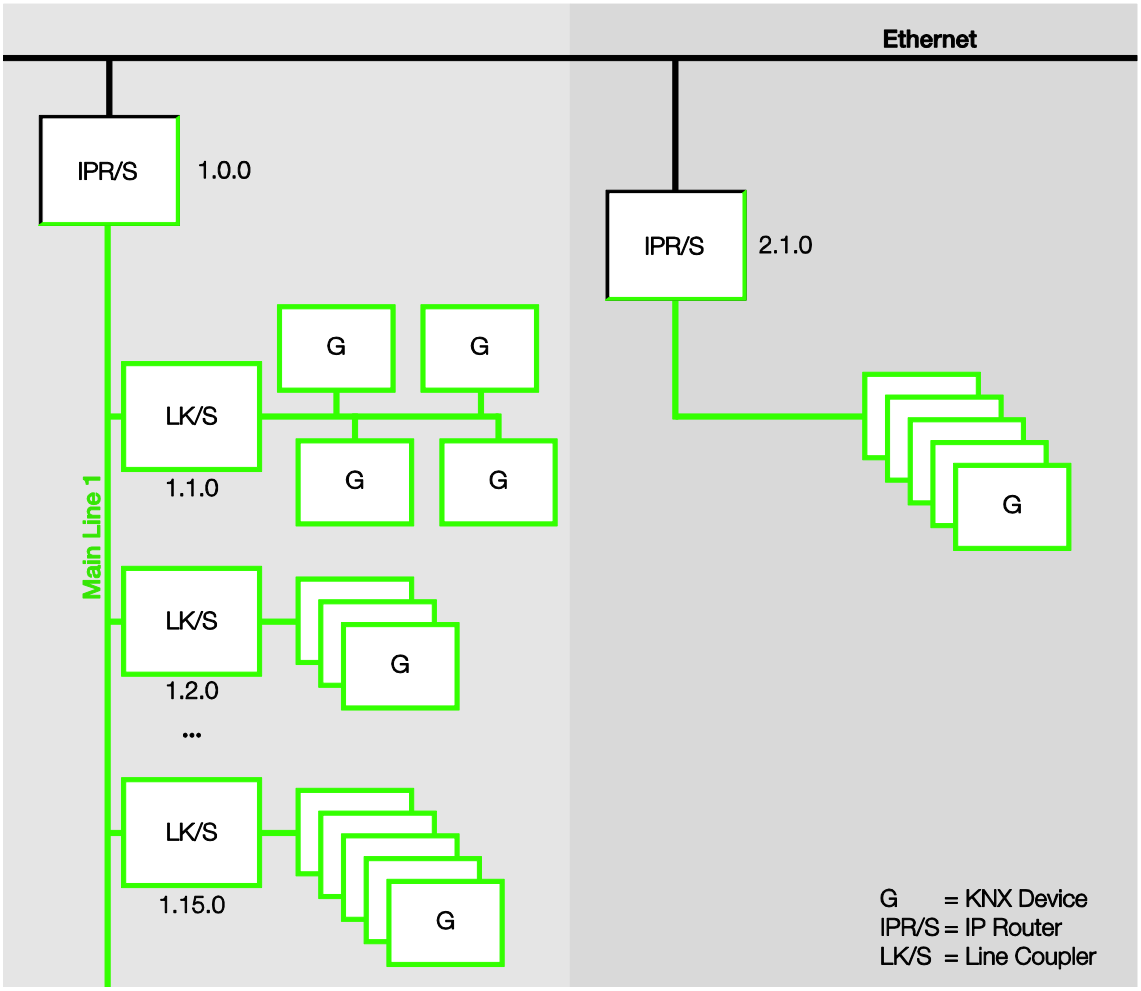
Le schéma ci-dessous illustre cette topologie avec des routeurs IP servant de coupleurs de ligne.



4.1.5 Topologie mixte

Lorsqu'une installation KNX le demande, il est possible d'utiliser le routeur IP comme coupleur de zone dans un endroit, p. ex. un immeuble à bureaux, et comme coupleur de ligne dans un autre endroit, p. ex. un garage sous-terrain plus éloigné.

Il est alors impératif de s'assurer que le routeur IP, dans sa fonction de coupleur de ligne, utilise l'adresse de coupleur de ligne d'une zone libre, p. ex. 2.1.0 dans le schéma ci-dessous.



4.2 L'i-bus® Tool

L'ABB i-bus® Tool est utilisé pour configurer certaines fonctions des appareils IP ABB.

Il facilite la partie IP de la mise en service.

Les boutons *Connecter*  et *Appareils IP*  permettent d'accéder aux paramètres IP du routeur.

Barre multifonction : Commutation entre les modes Discovery, Mise à jour du firmware et Unicast

Cliquez sur le bouton correspondant pour sélectionner le mode *Discovery*, *Mettre à jour* ou *Unicast*.

Discovery

Sélectionner le mode *Discovery* dans la barre multifonction.

Cette fonction sert à détecter et afficher les appareils IP ABB présents sur le réseau.

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

Mise à jour de firmware

Sélectionnez le mode *Mettre à jour* dans la barre multifonction.

Cette fonction permet de mettre à jour le firmware si cela s'avère nécessaire.

Important
Le firmware doit d'abord être téléchargé depuis Internet (*www.abb.com/knx)*. Pour ce faire, l'i-bus® Tool se connecte à un serveur **si une connexion Internet est disponible**. La mise à jour des appareils de l'installation ne requiert ensuite aucune connexion Internet.

Important
Pendant le processus de mise à jour, le bus KNX (TP) doit également être connecté au réseau IP (LAN) afin que les paramètres KNX puissent être restaurés correctement, sans quoi le processus de mise à jour échouera.

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

Remarque
Pour le processus de mise à jour, l'i-bus® Tool doit être exécuté avec les droits d'administration.

Unicast

Sélectionnez le mode *Unicast* dans la barre multifonction.

Cette fonction n'est disponible que pour l'IPR/S3.1.1 lorsque l'option *Unicast* est sélectionnée dans le paramètre *Mode de communication IP* de l'application ETS.

Pour plus d'informations sur le paramétrage, voir Fenêtre de paramétrage Mode de communication IP (Unicast), p. 37. La configuration de la communication Unicast s'effectue dans l'i-bus® Tool.

Remarque
Vous trouverez une description des fonctions dans l'aide en ligne de l'i-bus® Tool.

A Annexe

A.1 Pour passer commande

Type d'appareil	Nom du produit	Référence commerciale	bbn 40 16779 EAN	Poids 1 pce. [kg]	Unité d'emb. [pce.]
IPR/S 3.1.1	Routeur IP, MRD	2CDG110175R0011	**906 48 7**	0,1	1

ABB i-bus® KNX
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Third party software components, notices and OSS license texts

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- buildroot (v2012-05)

- memstat (v0.8)

under General Public License (GPL) Version 2:

- abbpower (v1.0)

- at91ft12 (v1.0)

- at91gpbr (v1.0)

- buildroot (v2012-05)

- busybox (v1.20.1)

- 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)

- U-Boot (v2010.09)

- udev (v058)

- util Linux (v2.20.1)

under General Public License (GPL) Version 3:

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- gdbserver (v7.2.50.20100908-cvs)

- gzip (v1.5)

- libgcc (v4.5.1)

- tar (v1.17)

- util Linux (v2.20.1)

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- gdbserver (v7.2.50.20100908-cvs)

- glib (libglib2) (v2.30.2)

- util Linux (v2.20.1)

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- glibc (v2.11.1)

- libgcc (v4.5.1)

- libkmod (v8)

- uclibc (v0.9.31.1)

- 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)

under BSD and BSD/MIT style licenses:

- AT91Bootstrap 1.9 (v1.9)

- 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)

under MIT licenses:

- expat (v2.1.0)

under Public Domain licenses:

- util Linux (2.20.1)

under ncurses license:

- ncurses (v5.7)

under libffi license

- libffi (v3.0.11)

under jpeg license

- libjpeg (v9a)

under CodeSourcery G++ Lite license

- codeSourcery G++ Lite (v2010.09-50)

under ROM-Bootloader license

- ROM-Bootloader

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AT91 Bootstrap (v1.9):

*

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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.

Busybox (v1.20.1):

--- A note on GPL versions

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in its entirety, below). Version 2 is the only version of this license which

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Version 2, June 1991

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=====

loginrec.c

loginrec.h

atomicio.h

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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
```

Much of the code and documentation enclosed is copyright by

the Free Software Foundation, Inc. See the file COPYING or

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.

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'

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.

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.

==========

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.

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 README s: 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.

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

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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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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unaltered; and any additions, deletions, or changes to the original files
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."

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...

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.

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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

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

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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
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Maier-Gerber, Walter Stoeber, Fred Schmitz, and Norbert Braunagel
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at the Digital Images company in Halle for providing me with extra
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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.)

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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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.

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.

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.

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.

- 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)

```
   ***************************************************************************
   | The latest release of lsof is always available via anonymous ftp |
   | from lsof.itap.purdue.edu.  Look in pub/tools/unix/lsof.         |
   ***************************************************************************


*******************************************************************************
| CHECK THE PATCHES/ SUBDIRECTORY FOR FIXES TO THE LATEST LSOF DISTRIBUTION. |
*******************************************************************************
 ******************************************************************************
 | AVOID USING PRE-BUILT LSOF BINARIES: SEE THE "PRE-BUILT LSOF BINARIES" |
 |              SECTION IN 00README FOR AN EXPLANATION.                   |
 ******************************************************************************


  ****************************************************************************
  | READ 00LSOF-L FOR INFORMATION ON THE LSOF-L LISTSERV MAILING LIST. |
  ****************************************************************************


   ***************************************************************************
   |     CHECK 00FAQ BEFORE REPORTING BUGS TO <abe@purdue.edu>.       |
   | 00FAQ ALSO AT: ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/FAQ |
   ***************************************************************************
```

```
**********************************************************************
| 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.

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.

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.

(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.

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):

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:

Except as contained in this notice, the name of Daniel Veillard shall not

be used in advertising or otherwise to promote the sale, use or other deal-

ings in this Software without prior written authorization from him.

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:

* This software copyright 1997 Joshua M. Yelon.

* Distribution subject to the terms of the GPL.

On Debian GNU/Linux systems, the complete text of the GNU General

Public License can be found in `/usr/share/common-licenses/GPL'.

Ncurses (v5.7):

-- $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:

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.

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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OpenSSL (v1.0.1g):

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==========

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*

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Pcre (v8.30):

PCRE LICENCE

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

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

Emain domain: freemail.hu

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THE C++ WRAPPER FUNCTIONS

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End

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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'.

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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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):

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-- Wolfgang Denk

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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/

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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

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
// This library is free software; you can redistribute it and/or
// modify it under the terms of the GNU Lesser General Public
// License as published by the Free Software Foundation; either
// version 2.1 of the License, or (at your option) any later version.
//
// This library is distributed in the hope that it will be useful,
// but WITHOUT ANY WARRANTY; without even the implied warranty of
// MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the GNU
// Lesser General Public License for more details.
//
// You should have received a copy of the GNU Lesser General Public
```

```
// License along with this library; if not, write to the Free Software

// 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.

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Version 3, 29 June 2007

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When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

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If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

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How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

one line to give the library's name and an idea of what it does.

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b) cause the whole of any work that you distribute or publish, that in whole or in part contains the Program or any part thereof, either with or without modifications, to be licensed at no charge to all third parties under the terms of this General Public License (except that you may choose to grant warranty protection to some or all third parties, at your option).

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b) accompany it with a written offer, valid for at least three years, to give any third party free (except for a nominal charge for the cost of distribution) a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Paragraphs 1 and 2 above; or,

c) accompany it with the information you received as to where the corresponding source code may be obtained. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form alone.)

Source code for a work means the preferred form of the work for making modifications to it. For an executable file, complete source code means all the source code for all modules it contains; but, as a special exception, it need not include source code for modules which are standard libraries that accompany the operating system on which the executable file runs, or for standard header files or definitions files that accompany that operating system.

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END OF TERMS AND CONDITIONS

Appendix: How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to humanity, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.>
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Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

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Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
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The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program `Gnomovision' (a program to direct compilers to make passes at assemblers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989
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Version 2, June 1991

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[This is the first released version of the library GPL. It is

numbered 2 because it goes with version 2 of the ordinary GPL.]

Preamble

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To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library, or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link a program with the library, you must provide complete object files to the recipients so that they can relink them with the library, after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

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Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Li-

brary or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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