The isdn diversion services are a supporting module working together with the isdn4linux and the HiSax module for passive cards.
Active cards, TAs and cards using a own or other driver than the HiSax module need to be adapted to the HL<->LL interface described in a separate document. The diversion services may be used with all cards supported by the HiSax driver.
The diversion kernel interface and controlling tool divertctrl were written by Werner Cornelius (werner@isdn4linux.de or werner@titro.de) under the GNU General Public License.

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1. Features of the i4l diversion services
   (Or what can the i4l diversion services do for me)

   The i4l diversion services offers call forwarding and logging normally only supported by isdn phones. Incoming calls may be diverted unconditionally (CFU), when not reachable (CFNR) or on busy condition (CFB).
   The diversions may be invoked statically in the providers exchange as normally done by isdn phones. In this case all incoming calls with a special (or all) service identifiers are forwarded if the forwarding reason is met. Activated static services may also be interrogated (queried).
   The i4l diversion services additionally offers a dynamic version of call forwarding which is not preprogrammed inside the providers exchange but dynamically activated by i4l.
   In this case all incoming calls are checked by rules that may be

compared to the mechanism of ipfwadm or ipchains. If a given rule matches the checking process is finished and the rule matching will be applied to the call.
The rules include primary and secondary service identifiers, called number and subaddress, callers number and subaddress and whether the rule matches to all filtered calls or only those when all B-channel resources are exhausted.
Actions that may be invoked by a rule are ignore, proceed, reject, direct divert or delayed divert of a call.
All incoming calls matching a rule except the ignore rule a reported and logged as ASCII via the proc filesystem (/proc/net/isdn/divert). If proceed is selected the call will be held in a proceeding state (without ringing) for a certain amount of time to let an external program or client decide how to handle the call.

2. Required hard- and software

For using the i4l diversion services the isdn line must be of a EURO/DSS1 type. Additionally the i4l services only work together with the HiSax driver for passive isdn cards. All HiSax supported cards may be used for the diversion purposes.
The static diversion services require the provider having static services CFU, CFNR, CFB activated on an MSN-line. The static services may not be used on a point-to-point connection. Further the static services are only available in some countries (for example germany). Countries requiring the keypad protocol for activating static diversions (like the netherlands) are not supported but may use the tty devices for this purpose.
The dynamic diversion services may be used in all countries if the provider enables the feature CF (call forwarding). This should work on both MSN- and point-to-point lines.
To add and delete rules the additional divertctrl program is needed. This program is part of the isdn4kutils package.

3. Compiling, installing and loading/unloading the module
Tracing calling and diversion information

To compile the i4l code with diversion support you need to say yes to the DSS1 diversion services when selecting the i4l options in the kernel config (menuconfig or config).
After having properly activated a make modules and make modules_install all required modules will be correctly installed in the needed modules dirs.
As the diversion services are currently not included in the scripts of most standard distributions you will have to add a "insmod dss1_divert" after having loaded the global isdn module.
The module can be loaded without any command line parameters.
If the module is actually loaded and active may be checked with a "cat /proc/modules" or "ls /proc/net/isdn/divert". The divert file is dynamically created by the diversion module and removed when the module is unloaded.

4. Tracing calling and diversion information

You also may put a "cat /proc/net/isdn/divert" in the background with the

output redirected to a file. Then all actions of the module are logged. The divert file in the proc system may be opened more than once, so in conjunction with inetd and a small remote client on other machines inside your network incoming calls and reactions by the module may be shown on every listening machine.
If a call is reported as proceeding an external program or client may specify during a certain amount of time (normally 4 to 10 seconds) what to do with that call.
To unload the module all open files to the device in the proc system must be closed. Otherwise the module (and isdn.o) may not be unloaded.

5. Format of the divert device ASCII output

To be done later