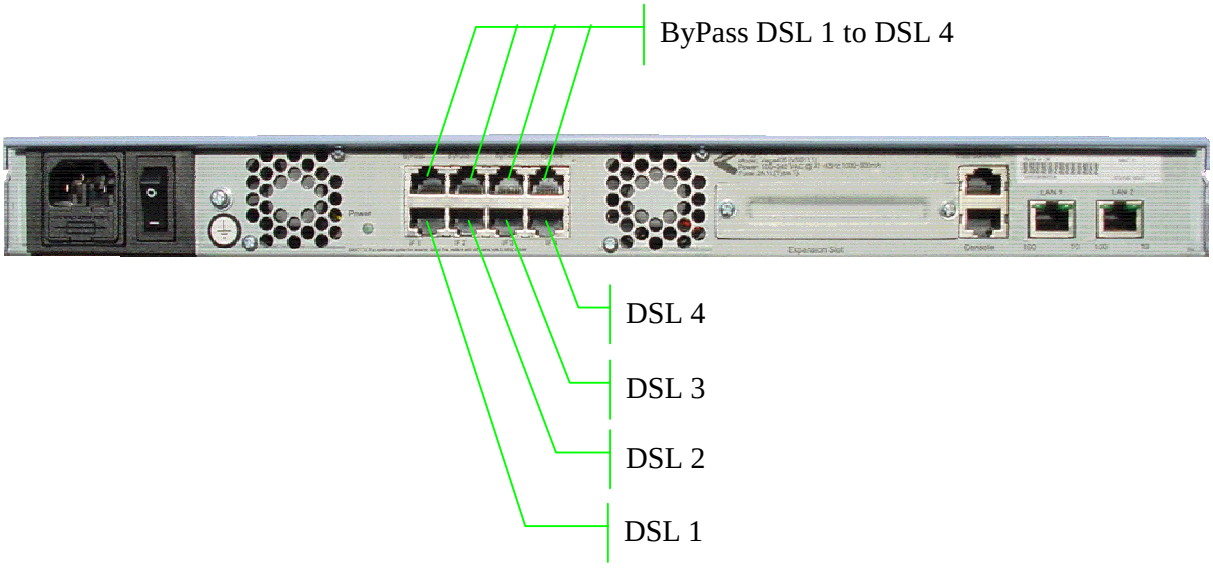
Information Note
Vega 400 ByPass Relays

Vega 400 gateways which support ByPass relays on their ISDN interfaces allow the Vega to be installed in resilient configurations without the need to purchase additional line capacity on the legacy telecoms infrastructure. In normal operation the Vega will terminate the E1/T1 DSL lines and handle and generate calls as appropriate. Through software control, or when the Vega is powered down or when the Vega is being upgraded, the Vega switches the incoming E1/T1 DSL lines through to the ByPass connectors. This allows, for instance, another Vega gateway to handle the calls when this Vega is unable to handle the call traffic.

Details

On the rear of the Vega 400 there are 8 RJ45 connectors to take E1/T1 DSL (telecoms) lines.

- The bottom four connectors take the E1/T1 lines that either connect through to the Vega itself, or connect through to the ByPass connectors.
- The top four connectors are the ByPass connections.



Under normal operation, the bottom row connectors are terminated by the Vega hardware and the Vega handles any calls made or received on those connectors; the ByPass connectors are open circuit and so will appear like an unplugged endpoint to anything that is plugged into them.

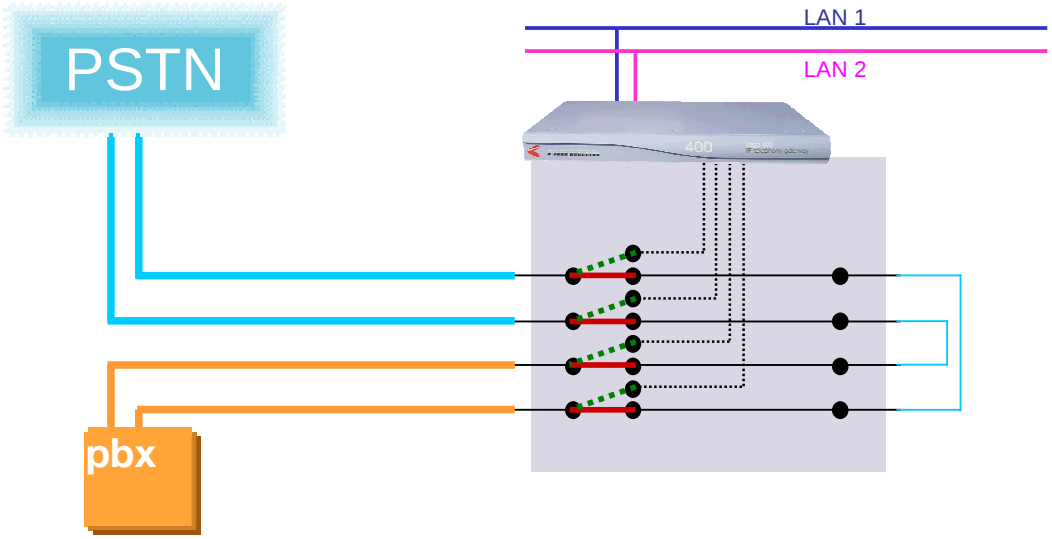
In ByPass mode the bottom row of connectors are connected 1:1 to the ByPass row of connectors above. The device(s) attached to the ByPass connectors will negotiate with the device connected to the incoming DSLs 1 to 4, allowing the links to be brought up and calls to be made between the devices. The Vega itself will be open circuit and so will not receive any calls and will not be able to make calls either.

Vega 400 installed between PSTN and PBX

If a Vega is connected in-line between the PSTN and PBX so that it can groom calls off to VoIP, or deliver calls from VoIP to the PBX or PSTN then, for redundancy, it is important to consider how to handle calls if the Vega cannot take them.

Example 1 – single Vega

As the Vega being out of service will be an unusual situation, it may be acceptable to just connect the PBX to the PSTN under failure cases – PSTN / PBX calls may still be made and received, but calls to and from VoIP will be unavailable.



Under normal operation (the relays in the dotted green position) the PBX and PSTN connections are terminated by the Vega enabling the Vega to control how PSTN, PBX and VoIP calls are routed, to VoIP, PSTN or PBX.

In ByPass mode (the relays in the red position) the Vega core becomes disconnected from the telecoms interfaces and so no VoIP calls can be routed. The PSTN connections and the PBX connections are routed to the ByPass connectors where loopback cables connect PSTN 1 to PBX 1 and PSTN 2 to PBX2. PSTN to PBX and PBX to PSTN calls may still be made, but the Vega will not be in control, so no VoIP calls can be completed.

Additional benefit:
Having telecoms ByPass functionality can also be useful when installing a Vega. The Vega may be physically connected into the telecoms and LAN infrastructure at a convenient time, e.g. when the telephones are not being used and physical access to the site is available (this can even be done by the customer himself). In the software configuration the Vega can be configured to remain in ByPass mode so that call handling is not changed – the PSTN and PBX continue to communicate with one another.

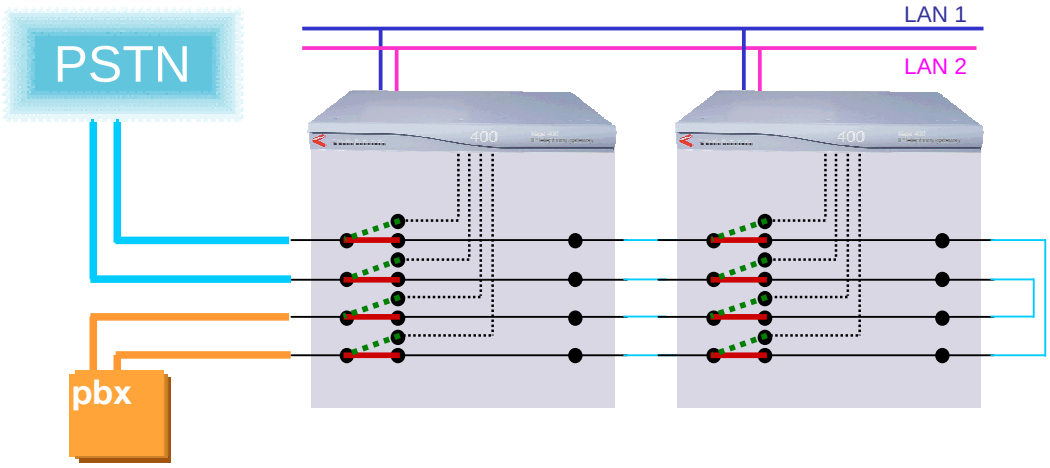
Then, at a time convenient to all, the Vega configuration can be loaded, ByPass mode removed and test calls made. This can be managed locally or remotely through the Vega's serial, telnet, or web browser interfaces, or using the Vega timed update services which can pick up configuration from ftp, tftp, http or https servers.

If successful, the Vega can be left in normal mode, and can handle all calls; if further configuration and testing is required before the Vega can be brought into service, the configuration can be returned to ByPass mode allowing the PSTN and PBX once more to communicate directly with one another.

The ability to remotely configure and test the Vega, switching it in and out of service makes for much easier installations, significantly reducing the need for on-site, out of hours, visits.

Example 2 – backup Vega

In scenarios, where connectivity to VoIP is paramount to the service operation, for instance in a VoIP enabled call centre, simply connecting PSTN to PBX when the master Vega is not available, is not acceptable – connection to a standby gateway is necessary when the first Vega is unavailable.



Under normal operation the PBX and PSTN connections are terminated by the left hand Vega enabling it to control how PSTN, PBX and VoIP calls are routed, to VoIP, PSTN or PBX.

If the left hand Vega is in ByPass mode the PSTN connections and the PBX connections are routed to that Vega's ByPass connectors which are themselves connected to the DSL inputs of the standby (right hand) Vega. PBX and PSTN connections are then terminated by the right hand Vega enabling it to control how PSTN, PBX and VoIP calls are routed, to VoIP, PSTN or PBX.

If both Vega gateways are in ByPass mode, neither Vega can handle the calls, so the PSTN connections and the PBX connections are routed to the ByPass connectors of the right hand Vega where loopback cables connect PSTN 1 to PBX 1 and PSTN 2 to PBX2. PSTN to PBX and PBX to PSTN calls may still be made, but neither Vega will be in control, so no VoIP calls can be completed.

NOTE

In resilient installations it is important to consider

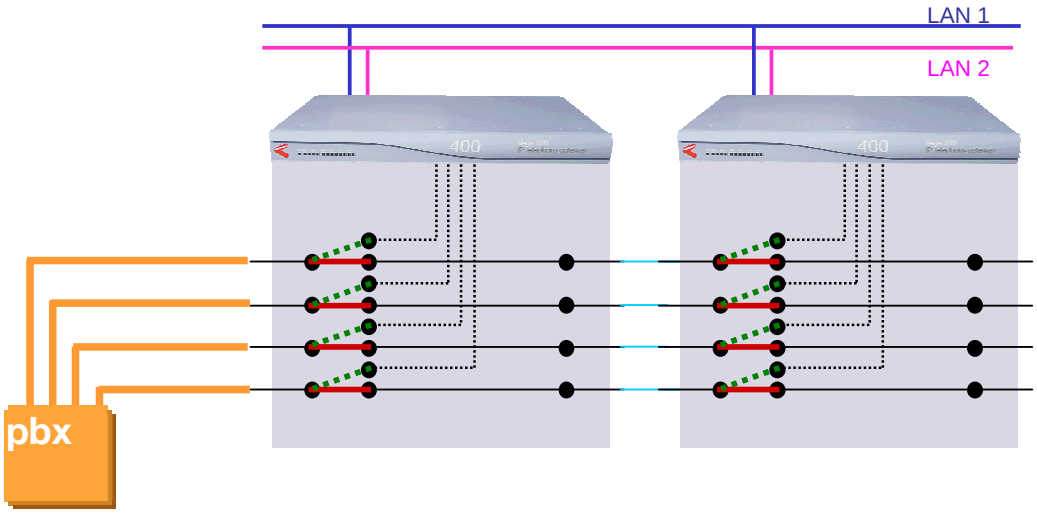
- Separate power sources for each Vega
- Battery backed up power sources
- Resiliency of LAN connections to the Vega gateways

See also ‘IN_37-Resilient setup of digital Vega gateways‘, available on www.VegaAssist.com

Vega 400 as PSTN replacement (or as trunking gateway to PSTN)

If a Vega is used as a PSTN replacement, e.g. for an ITSP to supply service to a customer, the only telecoms connectivity available on site is the Vega to PBX connectivity.

Use of the ByPass relays in the Vega 400 provides a resilient-telecoms solution without need of investment in further legacy telecoms infrastructure. Instead of having to double up on the number of telecoms interfaces into the PBX to allow for two connected (Master / Slave) Vega gateways, the gateways can be connected in series as shown below.



Under normal operation the PBX connections are terminated by the left hand Vega enabling it to route the PBX and VoIP calls.

If the left hand Vega is in ByPass mode the PBX connections are routed to the ByPass connectors which are themselves connected to the DSL inputs of the standby (right hand) Vega. PBX connections are then terminated by the right hand Vega enabling it to route the PBX and VoIP calls.

NOTE

In resilient installations it is important to consider

- Separate power sources for each Vega
- Battery backed up power sources
- Resiliency of LAN connections to the Vega gateways

See also ‘IN_37-Resilient setup of digital Vega gateways‘, available on www.VegaAssist.com

Additional benefit:

Vega 400 ByPass relays allow the Vega to be taken out of live operation at any time[1]. The ByPass relay configuration parameter can be configured to change the Vega into and then remain in ByPass mode.

This can be useful, for instance, for scheduled maintenance – the Vega can be put into ByPass mode, changes can be made to it and then normal mode resumed to allow it once more to handle the calls.

Vega 400 ByPass relay configuration

In the command line interface the parameter:

[dsl]
bypass_mode=normal ; options are bypass and manual

configures the mode of operation of the ByPass relays.

normal:
Vega will be in ByPass mode
- when powered down,
- when an upgrade is being performed on it, or
- when it is being rebooted.

Otherwise Vega will terminate the telecom connections and generate and receive calls.

Bypass:
Vega will always be in ByPass – it will not receive any telephony calls and will not be able to make any telephony calls.

Manual:
When configured as manual, the Vega will remain in ByPass mode after a power on or a reboot until a manual 'e1t1 bypass off' command is executed.

Command Line Interface commands:
- e1t1 bypass off
- e1t1 bypass on

off:
If dsl.bypass_mode is set to manual, 'e1t1 bypass off' will switch the calls to be routed to the Vega (remove any bypass)

on:
If dsl.bypass_mode is set to manual, 'e1t1 bypass on' will switch the calls to be routed to the ByPass connectors - Vega will no longer handle telephony calls

LAN connectivity

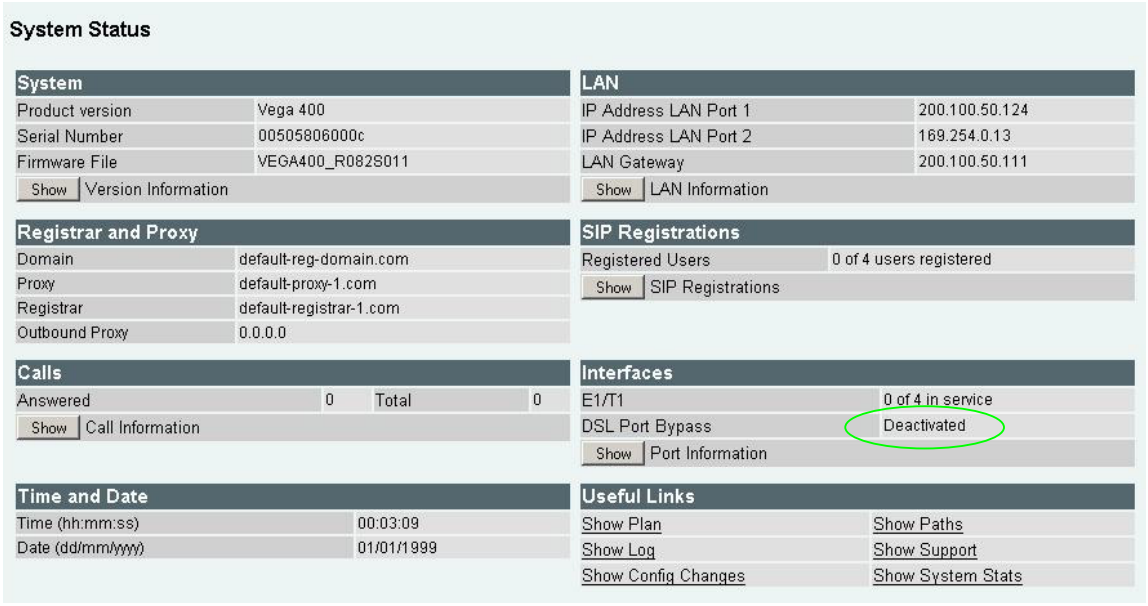
When dual-resilient or multi-resilient Vega gateways are in use, the sender of the VoIP call will not know which Vega will handle the call. The sender can choose to send calls to Vega gateways in priority order, waiting for the Vega to actively reject the call (if the Vega is powered) or for VoIP messaging to timeout (if the Vega is not responding, e.g. because it has lost power) before re-presenting to the next Vega.

[1] When ByPass relays switch, the endpoints that then handle the calls will have to re-synchronise their signalling, so there may be a short period of down-time whilst they do this. Calls in progress at the time of switching may loose their audio as audio connectivity is to the Vega where the call was initially set up – with new signalling synchronisation the audio connectivity cannot be re-routed to the standby Vega when the Master Vega goes into or comes out of ByPass.

Alternatively (and better) the sender can Fork the call to all of the resilient Vega gateways at the same time. The gateway that can handle the call will confirm this with a ringing indication or progress message. Those Vega gateways powered and in ByPass will actively reject calls, and those Vegas that are not powered will not respond. Forking the call results in no delay in finding a gateway that can handle the call.

ByPass relay status

The status of the ByPass relays can be seen on the System Status page – in the Interfaces section:



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