

# Xorcom TwinStar Hot Failover Solution for Asterisk®: The Proven Standard

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The best compliment a manufacturer can receive in any industry is to have another manufacturer publicly compare its products to theirs. It indicates there is a recognized leader in the industry for the specific area being compared. Such is the case with Xorcom and Digium. The latter has finally come out with a resiliency solution for Asterisk and is – [through a recent blog post](#) – trying to demonstrate that they now have a more cost-effective and robust resiliency solution than Xorcom.

While Digium undoubtedly has a good solution, let us first look at a few historical facts:

- Xorcom announced TwinStar for Asterisk PBXs back in **August, 2009**.
- Xorcom has **well over 500 global deployments** in large enterprise customer sites (e.g., Solar City, a former Digium customer, has **over 700 phones with 8 T1s supporting 120 simultaneous calls** for a total on average of **20,000 calls per day** – all managed on Xorcom’s XR3000 series servers with TwinStar).
- Digium cannot show such a system in action with Switchvox, as Switchvox is not built to manage this amount of traffic and recorded calls. It is no surprise that the Digium R850 mentioned in the post does not work with Switchvox, because Switchvox is not built to manage 8 T1s.

## Point-by-Point Comparison

Now back to Digium’s new product. In an effort to separate perception from reality, let’s take a look at each of their points as written in the blog post.

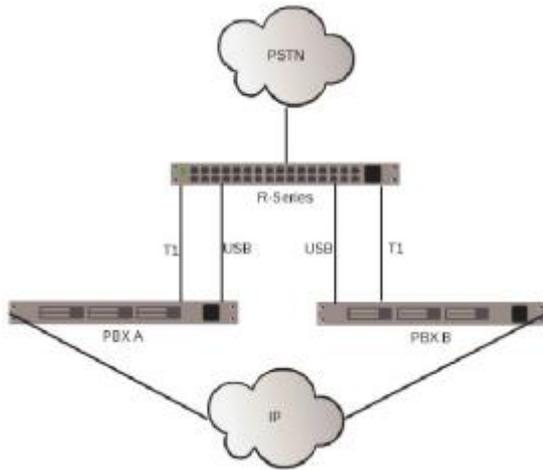
### Resiliency

“The combination of [Xorcom Astribank](#) (HW Channel Bank) and [Xorcom TwinStar](#) (Software for redundancy) **is a similar application** to the Digium R-Series.”

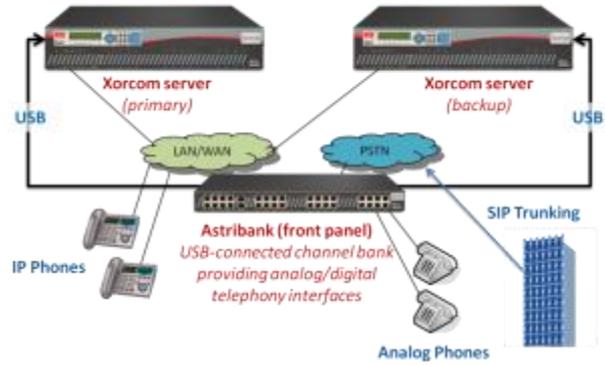
Saying the Xorcom TwinStar solution is a similar application to the Digium R-Series is quite a stretch as the product strategies are fundamentally very different. Xorcom promotes a manufacturer-supported turnkey hot failover solution for Asterisk-based PBXs. The Digium R-Series is nothing more than a “relay” which requires PRI or FXO cards in each of the PBXs, primary and backup, in order to have a resiliency solution. See diagram from the Digium R-Series manual below in comparison to a Xorcom TwinStar solution:

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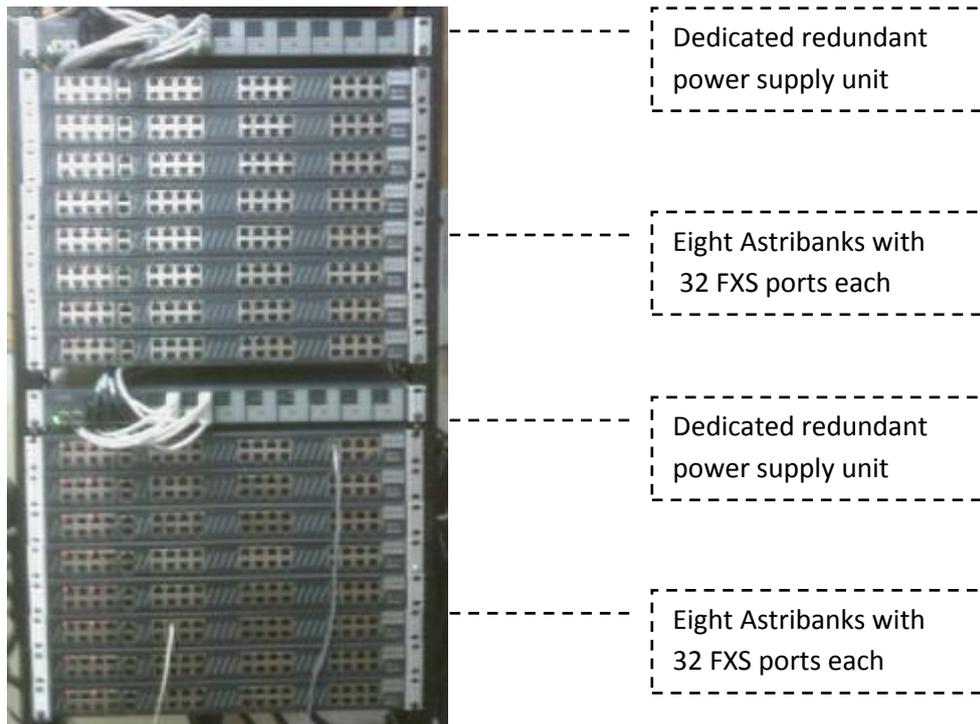
Digium R-Series schematic



Xorcom TwinStar schematic

In reviewing the above diagrams one can clearly see significant differences in the two solutions:

	Xorcom	Digium
<b>T1 Cards</b>	<b>Xorcom does not require duplicate T1 cards in each PBX.</b> That is because Xorcom uses USB 2.0 technology to actually pass phone calls over the USB cables. USB 2.0 has 480 Mbit/s of bandwidth which theoretically can support 2400 simultaneous calls. You would never actually do that but it does answer the question, is USB a good medium for passing phone calls? The answer is a resounding YES!	Digium uses the USB for power and monitoring only, not for passing voice traffic. A different set of cables connects the telephony interface housed in the server with the PSTN (using basic relay architecture). <b>This strategy forces the integrator to purchase duplicate T1 cards for the servers.</b>
<b>Mixed Interfaces</b>	Utilizing Xorcom Astribanks the integrator can have a <b>mix of PRI; FXO and FXS</b> within the same Astribank.	Since the Digium R-Series <b>cannot support T1 and FXO within the same unit</b> it forces the integrator to purchase separate units for each interface and duplicate both sets of cards in each PBX. The dollars and hardware start to add up fast.
<b>FXS Resiliency</b>	No problem!	<b>Since the Digium R-Series does not support FXS technology there is no resiliency support for FXS extensions.</b>



**Note:** This is a photo of an actual installation at a large resort in Branson, Missouri. The configuration includes sixteen 32-port FXS Astribanks (a total of 512 FXS ports) and two fully redundant power supply units that provide redundant power to all the Astribanks.

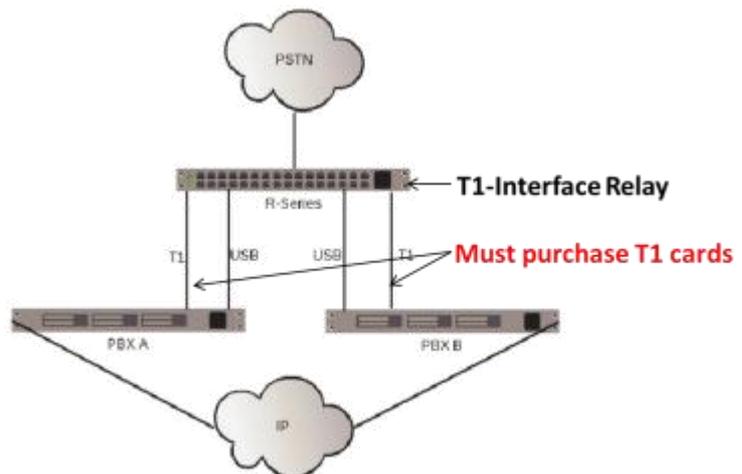
**Cost & Effort**

This is the next point from the Digium article:

“The Astribank hardware can run a customer up to four times the cost of R-Series appliances depending on the number of T1 interfaces that are populated in the Astribank. All eight T1 ports are included in the R-Series for [\\$995 list price.](#)”

If all the integrator had to purchase was the R-Series to make this work then it would be possible to agree with the above statement. However, this is not the case. It would appear that the engineering team at Digium does not quite understand how the Xorcom TwinStar solution works.

The Digium R850 is actually just a “relay” that switches the T1s when it senses a server failure. In order for this to work, **duplicate T1 cards must be purchased** – one set for each server. For example, in order to configure a resilient system for 8 T1s, you would need to purchase either **two 8-port T1 cards** or **four 4-port T1 cards**. See diagram opposite:



The example above gets even more complex if your client has FXO ports.

In addition, FXS is not supported at all for the R-Series resiliency solution.

Instead of purchasing and configuring all the hardware mentioned above, you could easily achieve PBX resiliency using a field-hardened and mature Astribank/TwinStar solution, such as the one described below:

### **Xorcom Resiliency for 8 E1/T1 ports**

You can purchase two Astribanks, each with a 4-port E1/T1 module (part number [XR0056](#)), for \$1,390.00 each and add the TwinStar license for \$345.00. The total for 8 E1/T1s in this example is \$3,470.00. *Remember, there are no E1/T1 cards to purchase for the servers, as this is managed by the Astribanks with USB connections.*



As you can clearly see, cost is relative. At Xorcom we aim to minimize hardware and concentrate on an intelligent device such as the Astribank that has the capability to manage the telephony interfaces for dual servers **and** be the watchdog for switching from the primary server to the backup server. This eliminates the need for telephony interfaces inside the servers. The solution has been in general production for 2.5 years and is mature and stable.

“The Xorcom TwinStar software is an additional cost. The open source tools used for the servers connected to the R-Series is downloadable and is free to use”.

TwinStar software is \$345.00 list price, per Astribank. Not exactly expensive for what Xorcom is providing! Besides, how can you compare a set of open source tools (that requires the integrator to build the system), with an out-of-the-box product that passes commercial grade quality assurance both in R&D and in production? How many hours will it take the integrator to achieve such a solution, and how confident will he be that the solution is sound?

In addition, Xorcom has absolutely no hidden fees or charges for our solution. See this note from the Digium R-Series User Guide:

#### **DRBD**

A USB flash drive will need to be installed on both the primary and secondary node for storing DRBD data. It is acceptable for the USB flash drives to not be of identical size as long as the smallest USB flash drive is at least 1GB in size. The USB flash drives must be large enough to store all data for Asterisk.

**Note:** USB flash drives are not provided with an R-Series unit. They must be purchased separately.

In addition, TwinStar solutions by Xorcom, when purchased with Xorcom servers, are already synchronized prior to delivery. If requested, we will even set the static IP addresses for each server and the cluster IP per your network! This allows you to simply connect the servers and start configuring your PBX as there is no software installation to perform...!

See the software instructions below from the R-Series User Guide:

To install your R-Series unit for use with other Digium hardware that relies on DAHDI, you will need:

- Linux 2.6 kernel headers
- Development libraries and headers for ncurses
- Development libraries and headers for zlib and openssl
- Development libraries and headers for newt
- GCC and standard software build tools
- Subversion
- Terminal emulation program such as Minicom (optional)

It is recommended that you use the most recent version of the Asterisk software for the best results. If you have previously installed this, Digium recommends that you upgrade to the latest “-current” version.

Additional software installation steps are described in Chapter 3—“Configuration”.

All software and libraries are installed for you when purchasing a turnkey TwinStar solution from Xorcom.

### Hardware Platform

“The Xorcom Astribank channel bank has more parts, such as a power supply, that are prone to fail. Digium utilizes USB power from the servers to power the R-Series which is much less vulnerable”.

For TwinStar implementations Xorcom manufactures and recommends the installation of our [Redundant Power Supply](#) unit, which can support up to 16 Astribanks and minimizes any single point of failure. The list price for the RPS is \$975.00.

“R-Series is 1U rack mountable and therefore takes up less space in the rack than the 2U Astribank”.

A quick search of our Web site would have informed the Digium engineering team that the Astribank is a 1U device.

### Functionality

“The TwinStar/Astribank solution can only detect a hardware power failure if the Linux kernel has crashed. It cannot detect if Asterisk has stopped working but is with the R-Series solution (along with loss of power detection)”.

Yes, that is correct. The TwinStar firmware does not detect if Asterisk has stopped working. However, note that Xorcom servers (as well as the most popular Asterisk distributions, including Elastix, trixbox and PBX in a Flash) employ the `safe_asterisk` script, which is a part of the Asterisk source package, to **automatically** restart Asterisk. Additionally, if DAHDI stops working, then TwinStar automatically performs the failover.

“If the R-Series were to lose power, the PSTN spans will continue to function through the same ports at the time of power failure. The Atribank will cease to operate at this point and communication with the PSTN is down”.

That is correct, Atribank does not work without a power supply. However, as mentioned earlier, we offer the [Redundant Power Supply](#) unit that eliminates call loss from a single power supply failure.

## R-Series Compatibility Issues

- The Digium R-Series solution cannot be used with FreePBX-based systems such as Elastix or trixbox, nor is it suitable for Digium’s Switchvox.
- Digium suggests replicating the Asterisk configuration files, the Asterisk log files and the voicemail files only. What about the MySQL databases, SIP phone provisioning files, DHCP lease file, and call recordings? What will happen with the CDR records without MySQL replication? It will be necessary to merge the records from two servers. So, their suggestion to keep the replication data on a USB drive does not seem sufficient. This solution does not require special hard disk formatting, but on the other hand is too limited.
- The Digium R-Series is not a complete resilience solution as presented, but rather a relay component that suits very specific circumstances: a limited number and type of ports, and very specific Asterisk distributions.

Digium, as well as RedFone, provides only about 30% of what is required in order to have a fully supported hot failover solution for Asterisk.

Let me be very clear and not mince my words. **Since August of 2009, Xorcom is the only IP-PBX manufacturer in the world that provides a 100%, fully supported, hot failover solution for Asterisk based PBXs.** Period.

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### Note:

If you feel that any of the information in this document is incorrect, please feel free to contact me directly so I may revise it for all our readers.

The Xorcom response to the Digium article published by [Nathan Miloszewski](#) is simply an attempt to clarify our functionality. Xorcom has always been a strong supporter of the Asterisk open source community and we believe it to be of the utmost importance to provide accurate information to the community.

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