



# Improving Business IT Resilience Using Warm Spare Virtual Machines

2023-06-23

## What a Warm Spare VM is

A Warm Spare (WS) VM is a VM that can rapidly replace an active VM when a problem occurs.

## Creating a Warm Spare VM

A second Hypervisor-running machine is required.

With the primary machine VM (pVM) not running, copy its file set to the secondary machine to create the WS VM (sVM). Then start the pVM as the active VM.

## Maintaining a Warm Spare sVM

It's not safe to run a WS VM whilst the active VM is running because those VMs have the same network address.

Instead, on the secondary machine create a 'utility VM' (uVM). For this we use and recommend AlmaLinux or Rocky Linux 9 (minimal) plus the rsync software package.

Attach the sVM's VHDs (virtual hard disks) to the uVM. When the uVM is started following that configure it to mount the sVM's VHDs at appropriate places, and create a script to get rsync to synchronise the pVM VHDs to the mounted sVM ones. Get that script automatically run often.

## Switching to the Warm Spare sVM

If the pVM becomes unusable shut it down. Then on the secondary machine uVM stop the rync-ing and unmount the sVM VHDs and detach them from the uVM. Then start the sVM. It's now the active VM.

## Reviving an Unusable pVM

VM-unusability almost always is the result of corruption of VHD files. To investigate the VHDs of the pVM, create a uVM on the primary machine and attach the pVM VHDs to it. Then mount them as for the WS maintenance, and start the diagnosis and repair process.

If a VHD file becomes too badly damaged to attach to a VM the next step depends on the circumstances.

## Switching back to pVM

To switch back to the pVM after solving its problems, attach its VHDs to the primary uVM, and mount them, and rsync the currently active (sVM) VHDs to its VHDs. Then on the sVM manually shut down all services that can cause user data updating, do a final primary uVM rsync run, and then shut down the sVM. Then on the primary machine, unmount and detach the pVM VHDs from the uVM. Then start pVM as the active VM.

Then resume maintaining sVM as before.

## Our Motivation For Producing This

We want businesses to achieve better outcomes, regardless of whether we're directly involved in making them happen. Such outcomes can produce effects that benefit many, including ourselves.