

## IBM Z and LinuxONE (s390x)

The enterprise platform for mission-critical applications brings next-level data privacy, security, and resiliency to your hybrid multi-cloud.

<https://www.ibm.com/it-infrastructure/z>

- Extraordinary Reliability
- Low Latency
- Familiar User and Developer Experience
- Dedicated CPU Architecture (z/Architecture)
- Used by 67 of the Fortune 100 Companies



IBM LinuxONE III

Most Linux distributions available, IBM offers support for

- Red Hat Enterprise Linux
- Ubuntu
- Enterprise SUSE

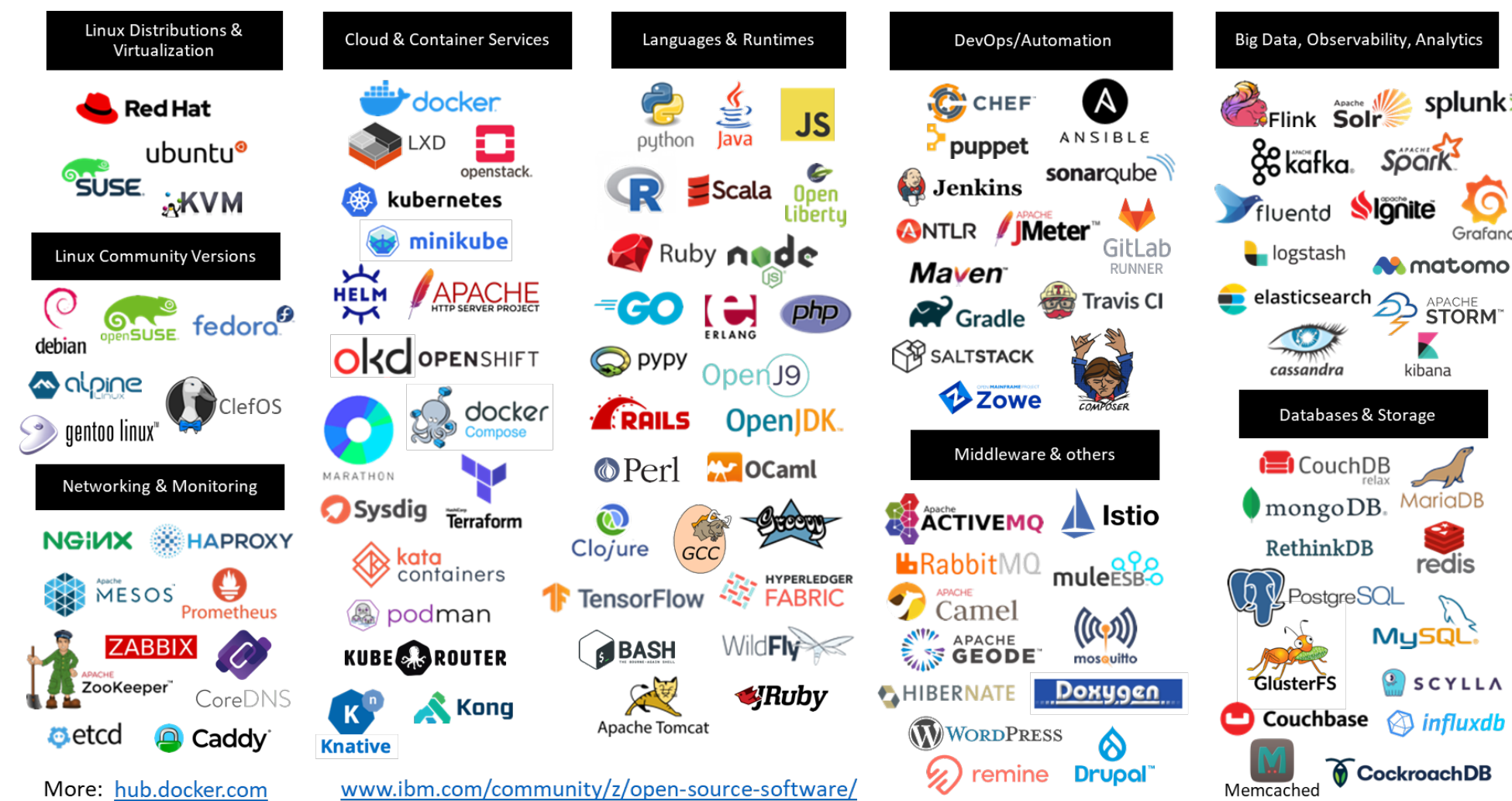


IBM Z15

- IBM Z where you can collocate different operating system (z/OS, z/VM, z/VSE, z/TPF, Linux)
- IBM LinuxONE designed and optimized exclusively to run on GNU/Linux

## IBM Z and LinuxONE Open-Source Software Ecosystem

IBM Z and LinuxONE has a strong open source ecosystem.



We need PyTorch in this Ecosystem!

## PyTorch on IBM Z and LinuxONE

Minimum PyTorch prebuilt package ready: <https://codait.github.io/pytorch-on-z>

```
(pytorch-package-38) [linux1@pytorch01 ~]$ rm -rf .cache/pip/
http://selfcheck/ wheels/
(pytorch-package-38) [linux1@pytorch01 ~]$ rm -rf .cache/pip/wheels/
(pytorch-package-38) [linux1@pytorch01 ~]$ pip install https://github.com/CODAIT/pytorch-on-z/raw/packages/torch-1.8.1-cp38-cp38-linux_s390x.whl
Collecting torch==1.8.1
  Using cached https://github.com/CODAIT/pytorch-on-z/raw/packages/torch-1.8.1-cp38-cp38-linux_s390x.whl (79.5 MB)
Collecting typing-extensions
  Using cached typing_extensions-3.7.4.3-py3-none-any.whl (22 kB)
Collecting numpy
  Using cached numpy-1.20.2.zip (7.8 MB)
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing wheel metadata ... done
Building wheels for collected packages: numpy
  Building wheel for numpy (PEP 517) ... done
  Created wheel for numpy: filename=numpy-1.20.2-cp38-cp38-linux_s390x.whl size=13861097 sha256=916462a660f0275887f7a1791c1b96a6d6f8fcc270138d5c85a2b339021b320d
  Stored in directory: /home/linux1/.cache/pip/wheels/e6/85/96/b353a55f333c41eb906284e4b5ff81fe65a5512edee8270e8c
Successfully built numpy
Installing collected packages: typing-extensions, numpy, torch
Successfully installed numpy-1.20.2 torch-1.8.0a0+56b43f4 typing-extensions-3.7.4.3
(pytorch-package-38) [linux1@pytorch01 ~]$ uname -a
Linux pytorch01.marist.edu 4.18.0-240.15.1.el8_3.s390x #1 SMP Wed Feb 3 03:19:32 EST 2021 s390x s390x s390x GNU/Linux
(pytorch-package-38) [linux1@pytorch01 ~]$ python -c 'import torch; print(torch.arange(10))'
tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

## Future Plan

- Make more PyTorch features available on IBM Z and LinuxONE
- Establish a public CI on LinuxONE for PyTorch
- Optimization for z/Architecture
- Have fun with IBM LinuxONE at <https://linuxone.cloud.marist.edu/#/register?flag=VM>

