IBM LinuxONE™

IBM z14

Machine Type 3906
5 Models (M01, M02, M03, M04, M05)
1-4 Drawers
Up to 32TB Memory (Max. 8TB per drawer)
CP and SC: 14nm Technology, SIMD, SMT2
5 / 6 PU + 1 SC Chips / drawer
Up to 196 PUs, 41 or 49 PUs/drawer
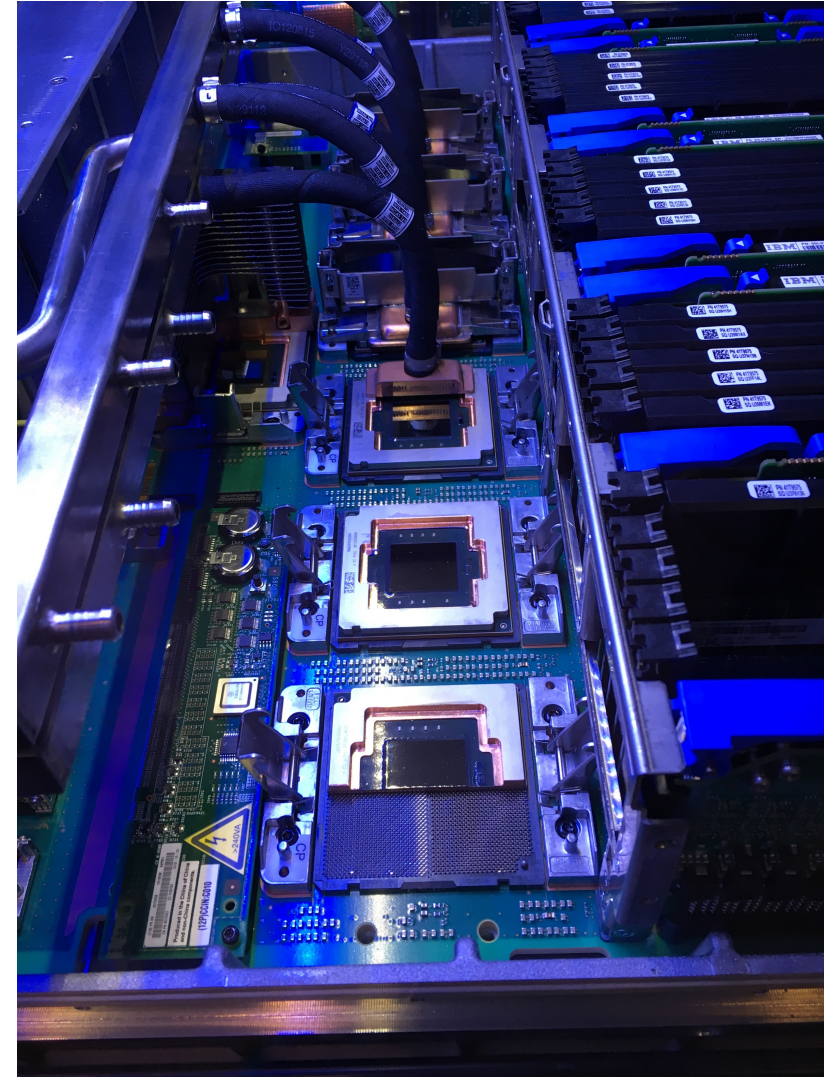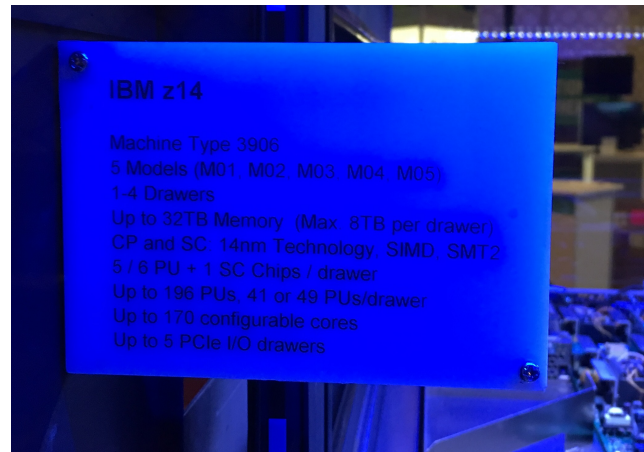Up to 170 configurable cores
Up to 5 PCIe I/O drawers

World's leading businesses run on IBM Z

92
of the top 100 worldwide banks

10
out of 10 of the world's largest insurers

23
of the top 25 US retailers

23
out of 25 of the world's largest airlines

processing the world's transactions & data

80 percent
of the world's corporate data resides or originates on mainframes

23 billion
ATM transactions per year processed by the mainframe worth more than **$1.4 trillion**

55 percent
of all enterprise applications need the mainframe to complete transactions

30 billion
business transactions processed on the mainframe per day

$6 trillion
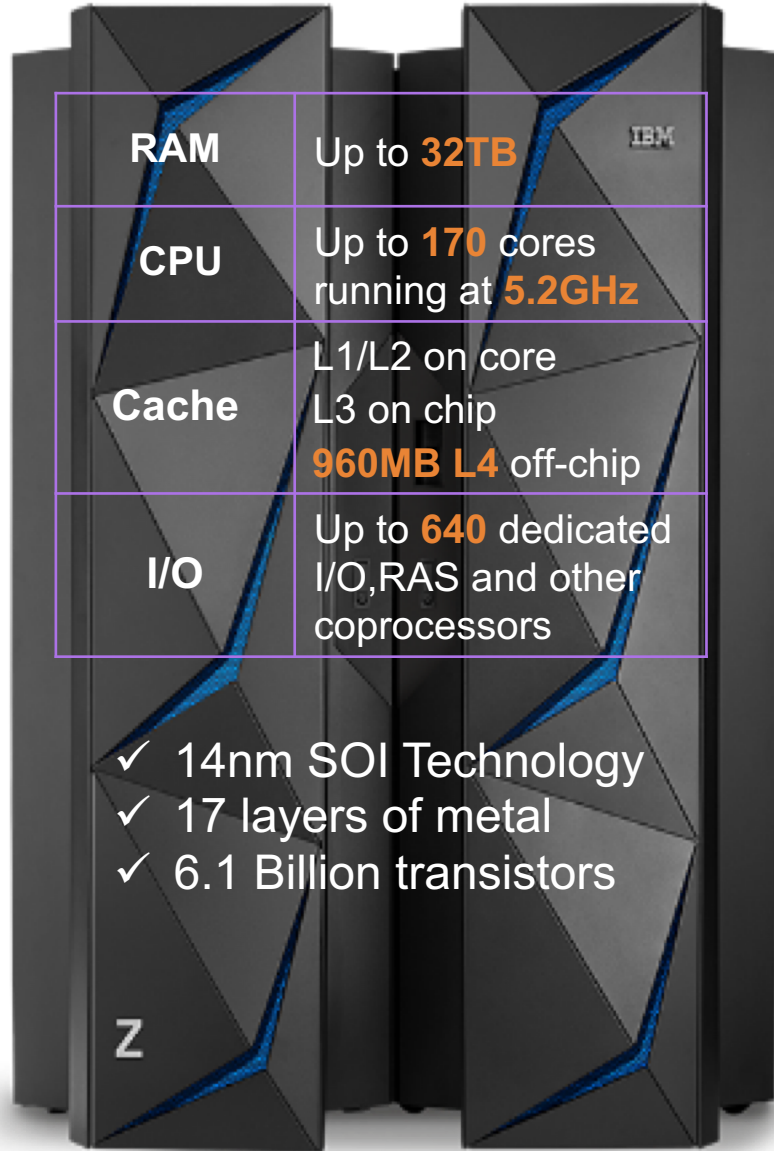credit and debit card payments processed annually (nearly 100% of all credit card transactions)

3 billion
travelers a year; with 2x that expected by 2030 (mainframes process nearly all air travel reservations)

91 percent
of surveyed CIOs said that new customer-facing applications are accessing the mainframe

IBM **Z**

IBM LinuxONE™ Emperor II

RAM	Up to **32TB**
CPU	Up to **170** cores running at **5.2GHz**
Cache	L1/L2 on core L3 on chip **960MB L4** off-chip
I/O	Up to **640** dedicated I/O,RAS and other coprocessors

- ✓ 14nm SOI Technology
- ✓ 17 layers of metal
- ✓ 6.1 Billion transistors

Extreme Virtualization and Scale

- Hypervisor partitioning built into firmware
  - Complete isolation – **EAL5+**
- 85 hypervisors– z/VM or KVM
  - **1k** Linux guests/hypervisor
  - **>2 million docker** containers
  - Hypervisor communication is via fast, in-memory sockets
    - **3x less latency than discrete servers**
- Non-disruptively add/remove Linux resources from Linux guests
- Non-disruptively add/remove Linux guests
- Built-in error detection and correction for high availability

Security in hardware

- Each core has its own cryptographic co-processor
- Crypto Express6S PCIe card adds additional crypto capability
  - Elliptic Curve, SHA3, Visa FPE, etc.
- Meets FIPS 140-2 level 4 , ANSI, PKI, and DK standards
- End-to-end pervasive encryption with no performance impact
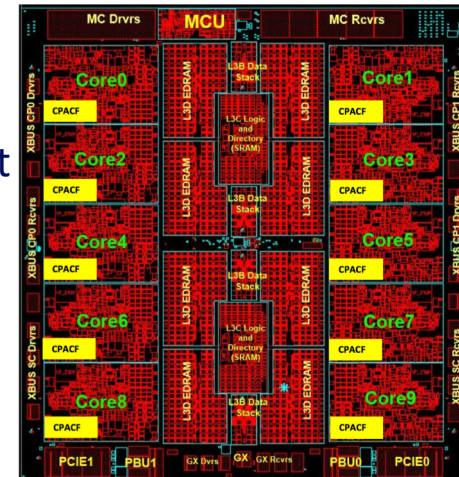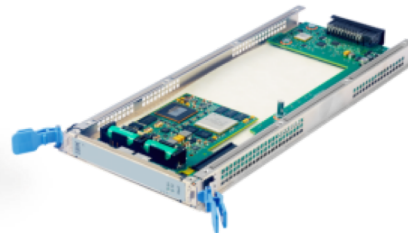
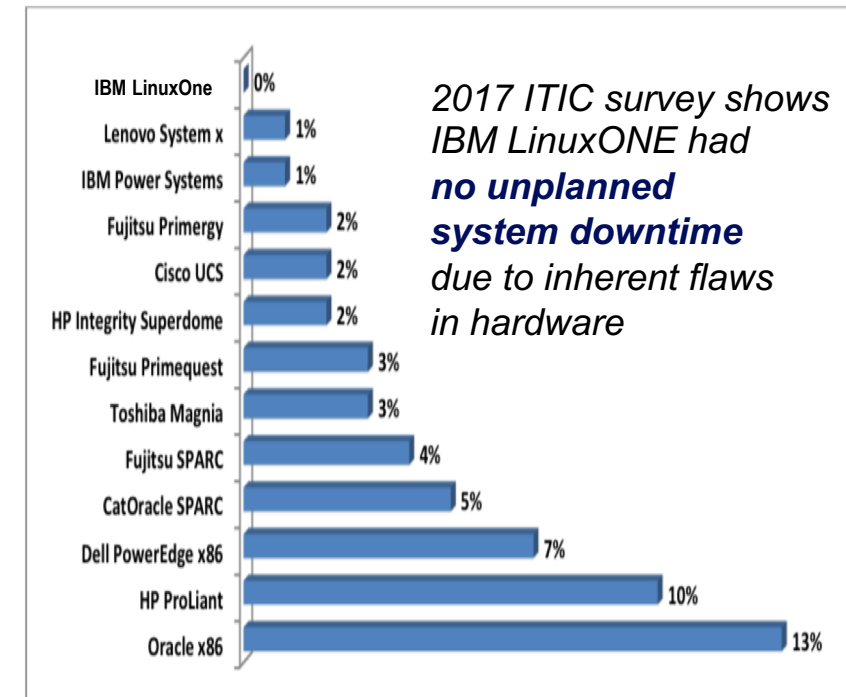# The promise of open-source data serving on IBM LinuxONE

security

- Pervasive encryption across the entire system

- Protected-keys on LinuxONE provides significantly enhance security over open-key technology, while offering **up to 28x better performance** over standard secure-key technology

- Isolation on LinuxONE starts at the hardware ...
  "What happens in a VM stays in a VM"

performance and scalability

- Scale-up a single MongoDB instance to **17 TB on a single system** without database sharding

- Run the YCSB benchmark on MongoDB with **up to 2.6x more throughput** per core

- Run the pgBench benchmark on PostgreSQL with **up to 2x more throughput**

- Pause-less Garbage Collection. **10X** shorter pause-times for Java

availability

minimal unplanned downtime

IBM LinuxOne	0%
Lenovo System x	1%
IBM Power Systems	1%
Fujitsu Primergy	2%
Cisco UCS	2%
HP Integrity Superdome	2%
Fujitsu Primequest	3%
Toshiba Magnia	3%
Fujitsu SPARC	4%
CatOracle SPARC	5%
Dell PowerEdge x86	7%
HP ProLiant	10%
Oracle x86	13%

*2017 ITIC survey shows IBM LinuxONE had **no unplanned system downtime** due to inherent flaws in hardware*

A rich ecosystem already runs on LinuxONE and IBM Z

IBM LinuxONE™ Community Cloud

Wondering how your code will run on LinuxONE?

The IBM LinuxONE Community Cloud provides a no charge, self-provisioned SUSE or Red Hat virtual machine on an IBM LinuxONE Enterprise Server (s390x architecture) to develop, test, and run your apps.

https://developer.ibm.com/linuxone