Serverless: Beyond the Cloud

Ali Kanso, Alaa Youssef
Presented by: Ali Kanso, PhD
Senior Cloud SW Engineer
IBM Research
T.j. Waston, NY
USA

Can we Execute Everything in the Cloud?

- ✓ Sadly, no!
  - ✓ Even in a serverless world, servers exist
  - ✓ Cloud computers are still computers

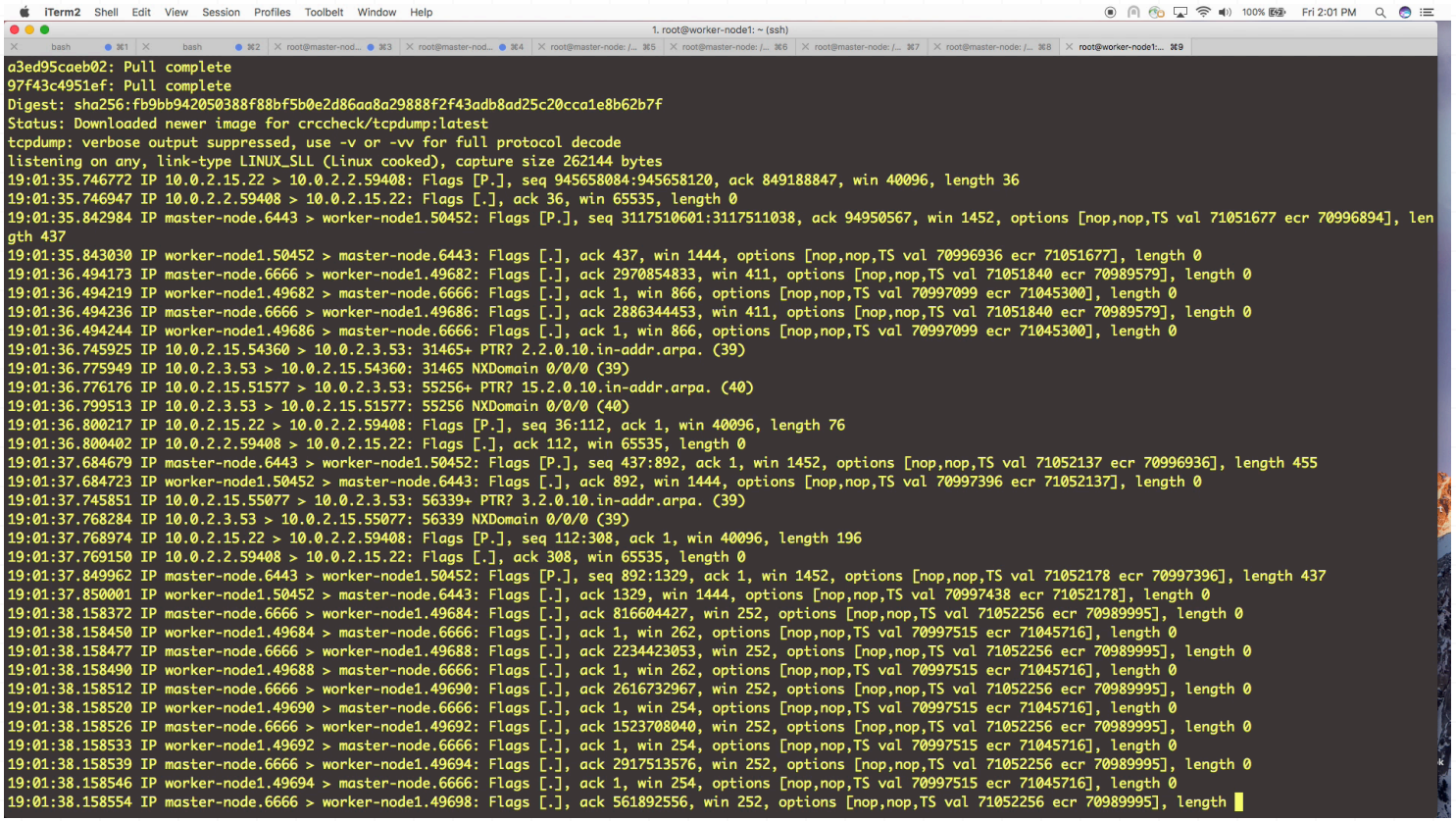
```
root@worker-node1:~# ping 192.169.49.12
PING 192.169.49.12 (192.169.49.12) 56(84) bytes of data.
--- 192.169.49.12 ping statistics ---
3 packets transmitted, 0 received, 100% packet loss, time 2016ms
```

The “Unfrequented” SW

```
root@worker-node1:~# tcpdump -i any
The program 'tcpdump' is currently not installed. You can install it by typing:
apt install tcpdump
```

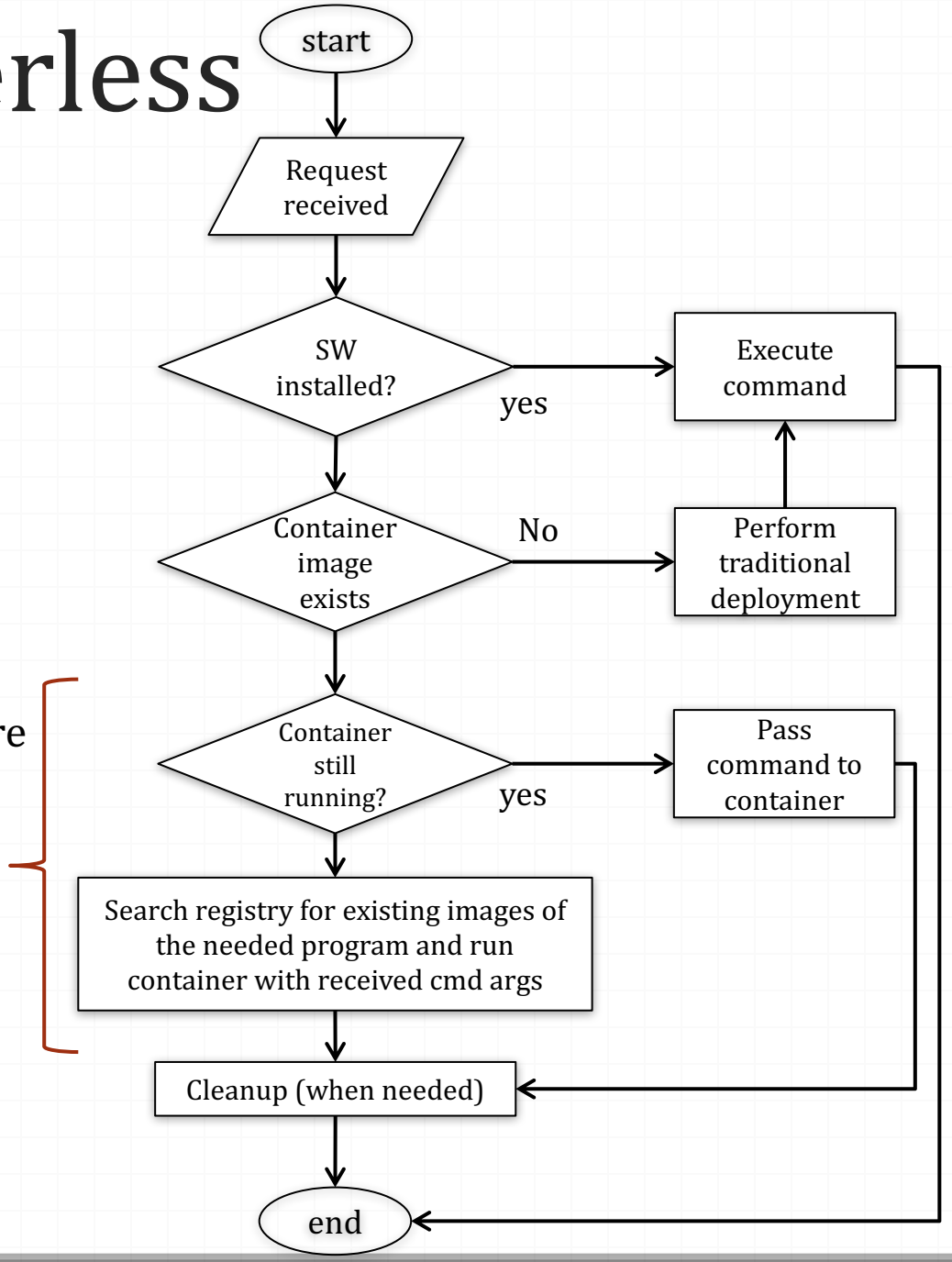
- ✓Installation hassle
- ✓Probably will sit idle for weeks
- ✓May install unwelcomed dependencies (compromised packages)
- ✓Will occupy disk space (maybe CPU, Mem, …)
- ✓Removal hassle, (may leave residues)

How About a Different Approach

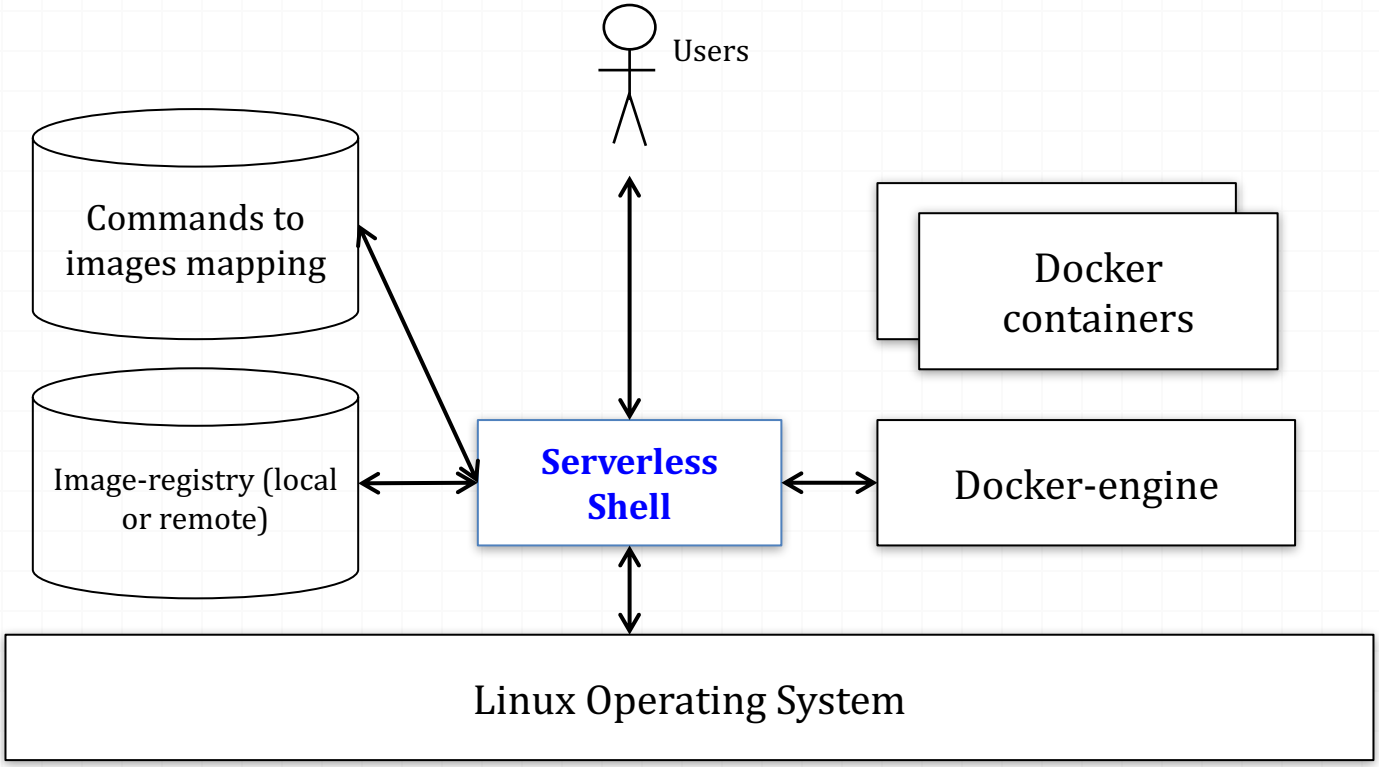


The Serverless Shell

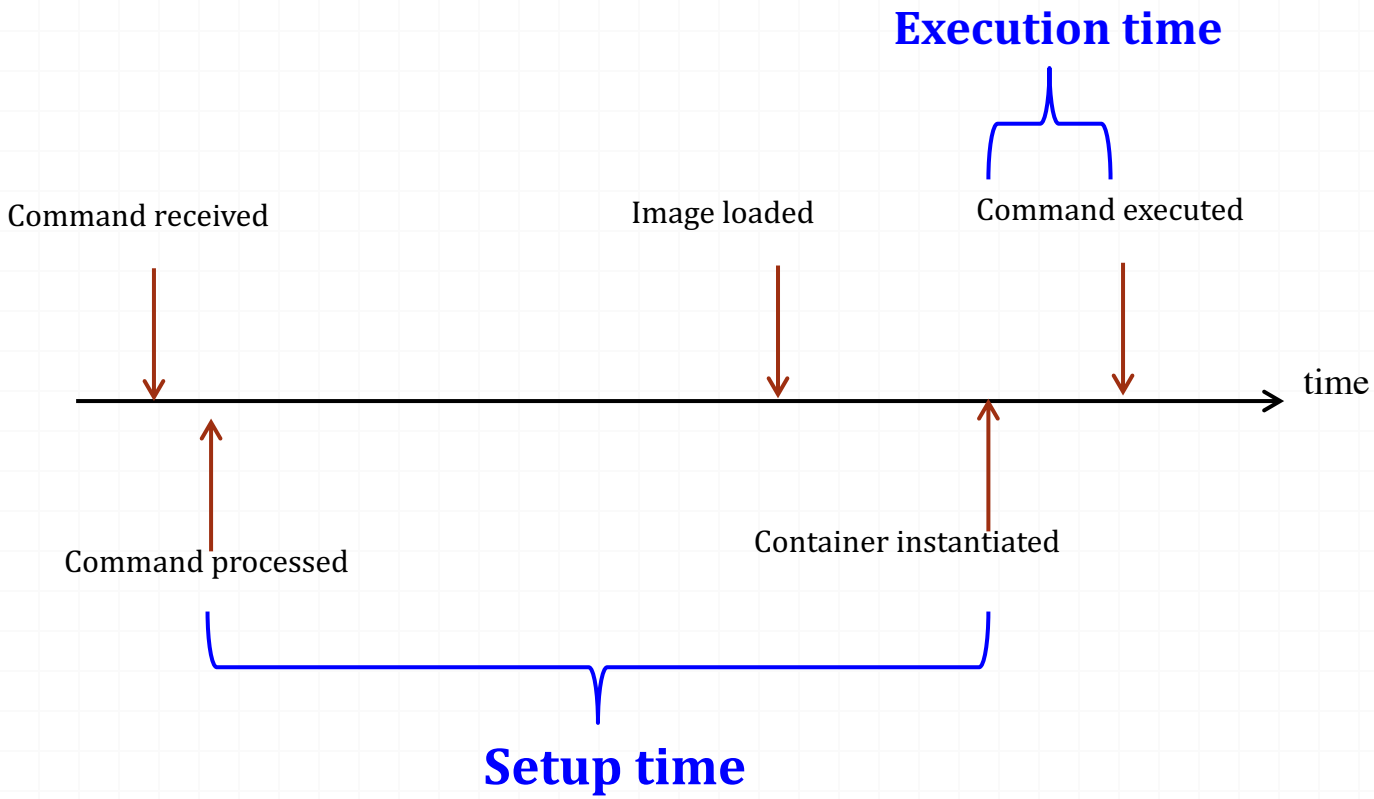
- ✓ Run in Isolation: secure
- ✓ Resource Bounded
- ✓ Automatic upgrades
- ✓ Cross Platform
- ✓ Easy to install
- ✓ Easy to cleanup



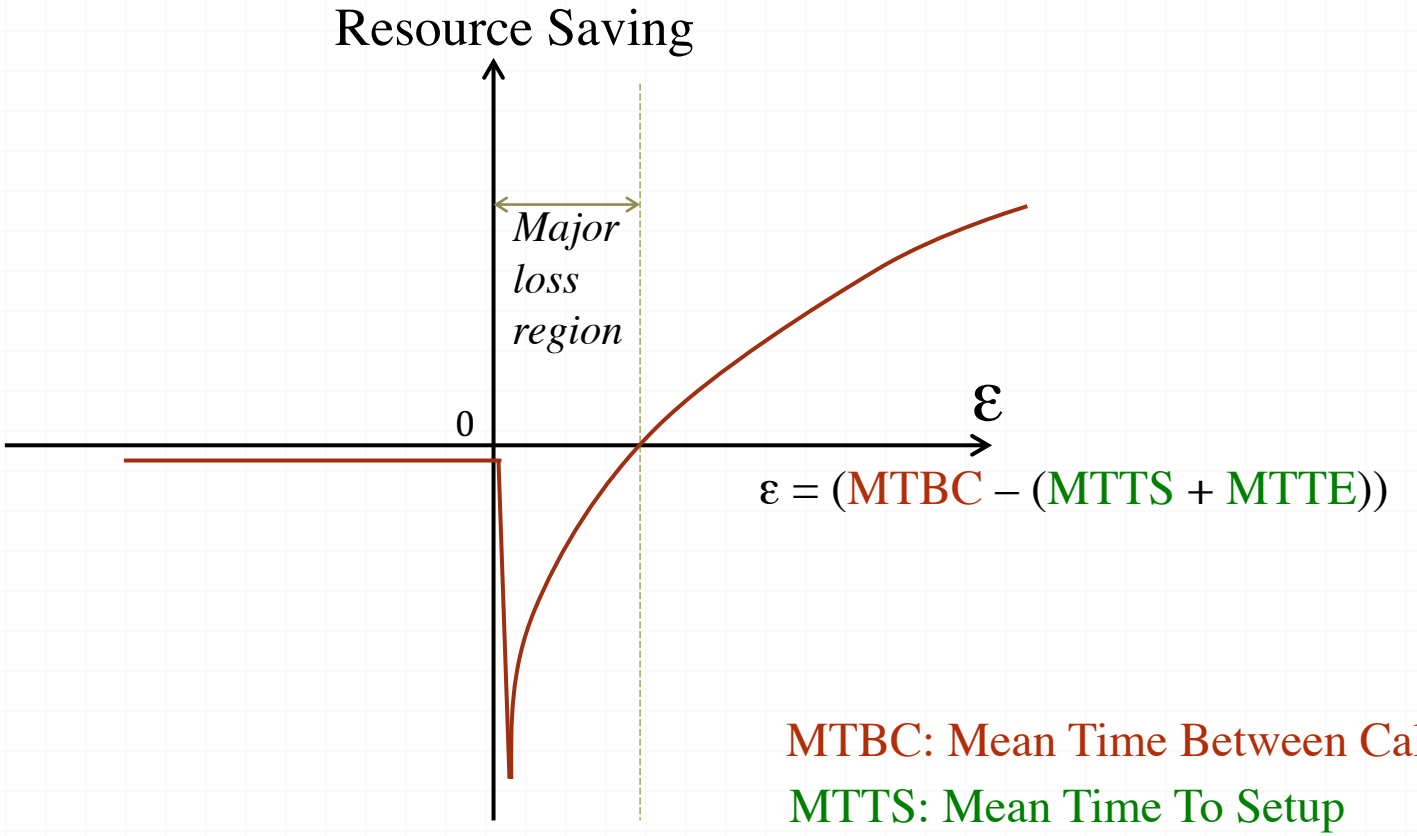
The Serverless Shell Architecture



Time Analysis



Are We Consuming More or Less Resources?



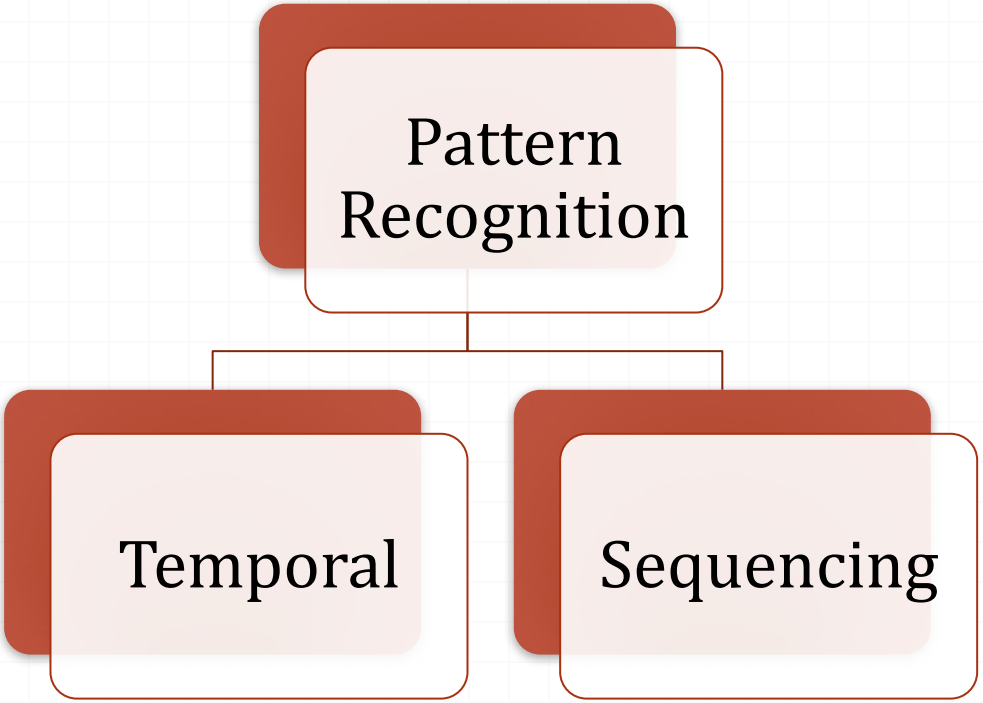
MTBC: Mean Time Between Calls

MTTS: Mean Time To Setup

MTTE: Mean Time To Execute

How Can Optimize?

Caching!



Conclusion

- ✓ Serverless does not have to be **just** a Cloud technology
  - ✓ It can be a **mindset**, that we can apply on any device or platform

Questions?

Are we done installing SW??