

IoT and Blockchains

Virtual RPi-s

Phillip G. Bradford

University of Connecticut, Stamford CT. USA

phillip.bradford@uconn.edu



Outline

Virtual machines

Raspberry Pi-s

Virtualized RPI-s

What is a Virtual Machine?

A machine that emulates
another machine

Church-Turing thesis and
universal Turing machines

Cloud – super-scaling through
portability of processing

Why Virtual Machines?

Master/slave VMs

Autonomous VMs

Orchestrating complex systems
Emulating many machines

Virtual Machines Models

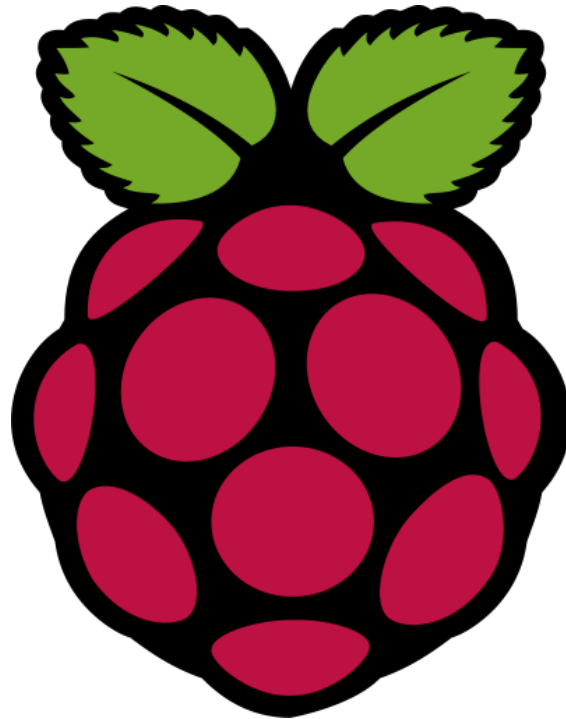
Saving state

Virtual networks

Sharing resources

Generating consensus

Why Raspberry Pi-s?



Will IoT adopt mostly to Turing complete computers?
Much IoT will be for non-Turing complete computers

What can we do with Raspberry Pi-s?

10 Raspberry Pi-s for the cost of a good laptop

Any advantage from ten Raspberry Pi-s?

General purpose autonomous computation

Raspberry Pi-s are autonomous

Raspberry Pi-s are general purpose

Why virtualization?

Isolation

Migration

Replication

Ease of provisioning

Agility

Virtual Machines for IoT?

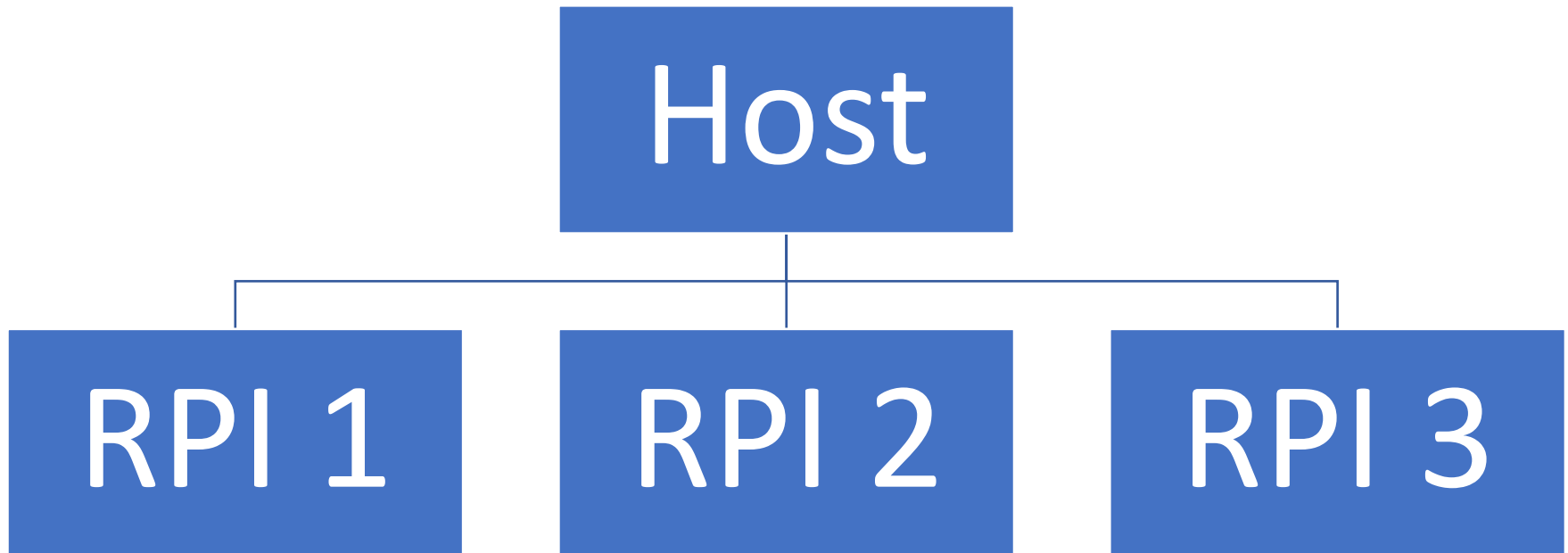
IoT devices

Planning and design before implementing

Emulators are key!

Towards mix and match emulation to keep up with the combinatorial explosion of hardware configurations

Client/Server

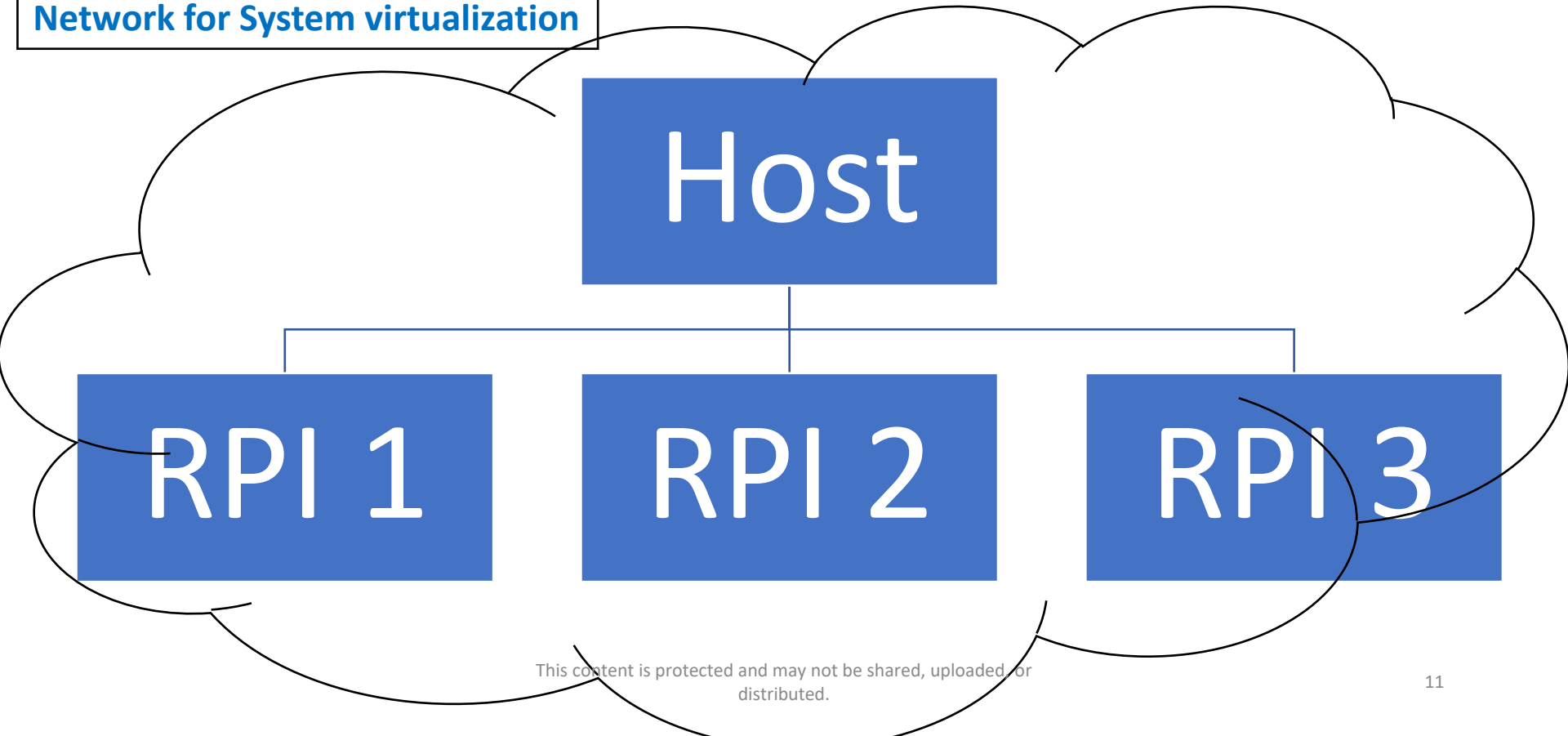


Network needed

System virtualization – DNS servers, routers, etc.

Process virtualization – OS serves as communication hub

Network for System virtualization



What can we do with Raspberry Pi-s?

Distributed consensus with autonomous machines

Paying for maintenance

Adding value

Distributed computing

Autonomous - Blockchains

Synchronized - Clockchains