Digital Rebar Provision

Open Foundational Automation

http://rebar.digital

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Provision *(verb)*

Equip or prepare for a journey.

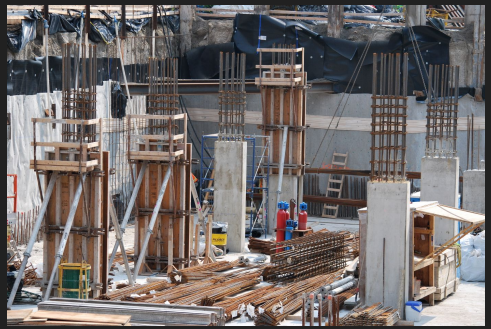
For data centers, to operationalize equipment.

Incorrectly assumed to be simply installing an operating system on a server.

Rebar *(noun)*

Structural steel added to concrete foundations to improve their resilience.

For data centers, software that automates infrastructure underlay to build a solid operational foundation.



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Physical Underlay Automation

is

Data Center Plumbing

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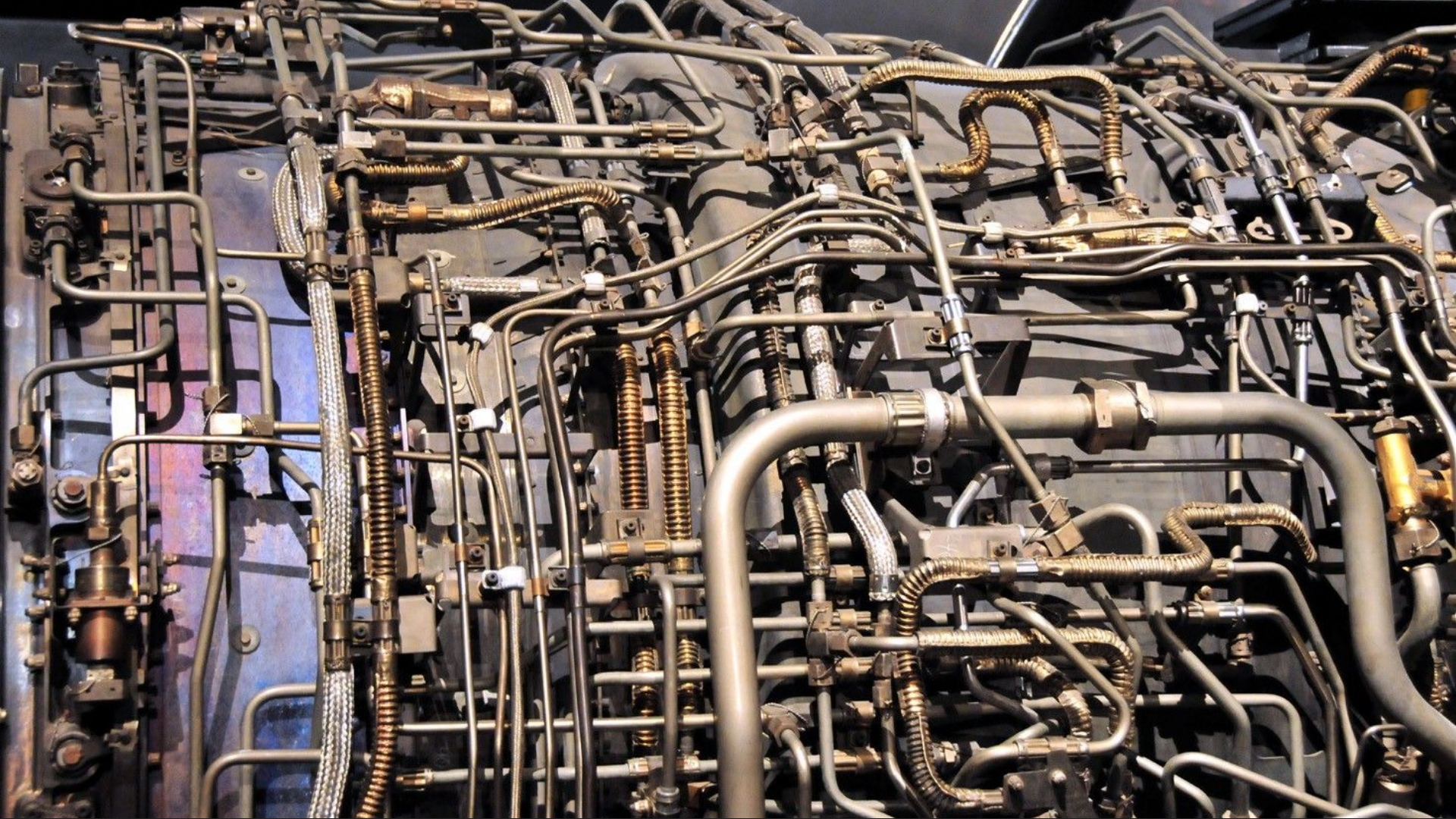


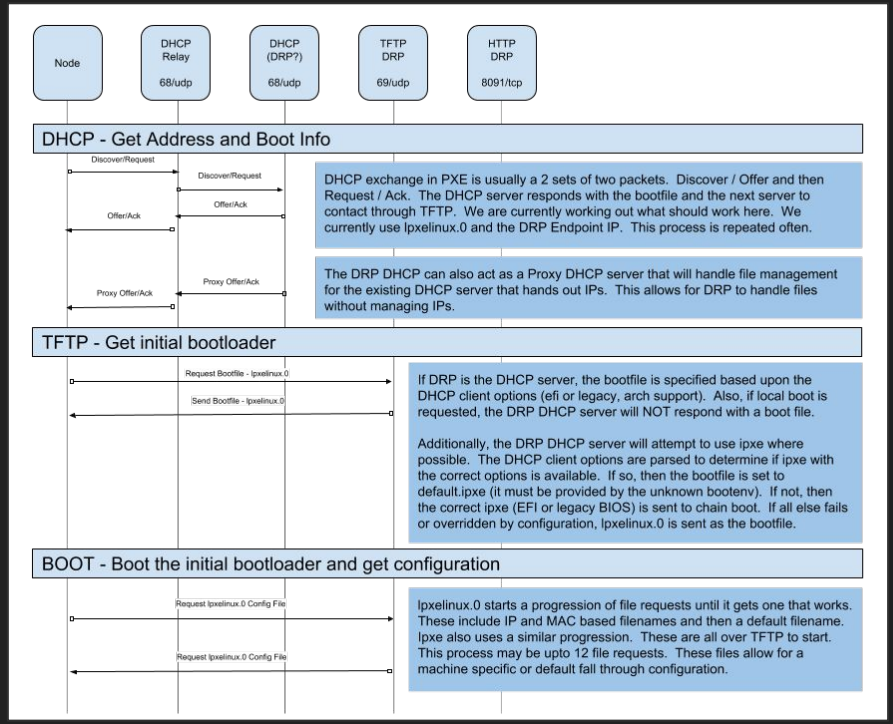
What is Provisioning?

Much more than installing an operating system using PXE!

Provisioning is a multi-step process that interacts with multiple protocols, through multiple boot cycles.

The process requires both pre and post deployment steps.

Out-of-band (IPMI) management is NOT required for provisionings.



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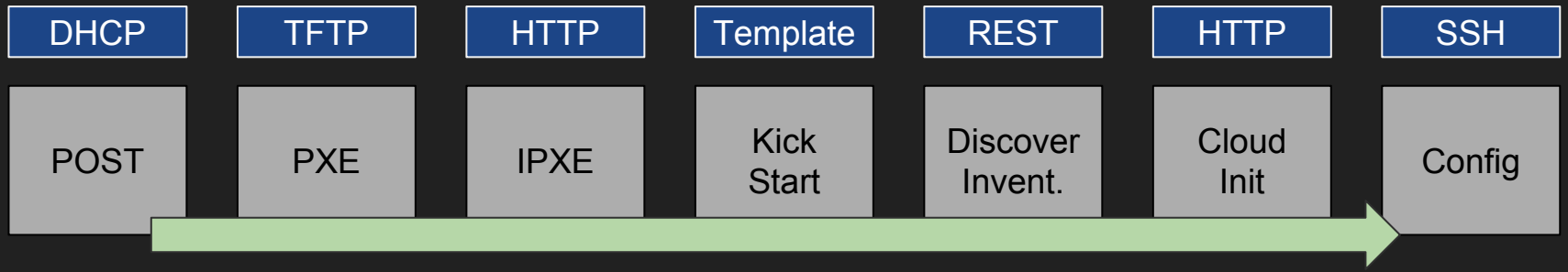
What makes Provisioning so hard?



Even static provisioning requires integrating many different protocols in a very specific sequence that varies depending on the operating system, hardware and networking configuration.

Digital Rebar “dynamic provisioning” is able to react the the environment on-the-fly to manage the sequence (workflow) based on collected state & external requests.

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Accept that every data center is a snowflake!

If Digital Rebar becomes too opinionated if cannot fully support the existing infrastructure. For example, we have many different DHCP modes including none, primary, forwarding and proxy.

But variation includes network topology, processor architecture, server configuration, operating systems and configuration tooling. Even harder, much of the required information is temporal.

Digital Rebar is a **stateful service** that collects machine and system parameters in a loosely coupled way. Each component and stage defines require and optional data; however, everything is late bound so there is no determinist graph.

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Digital Rebar rethinks data center automation from the ***Bare Metal*** up

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Networking

ZTP, DHCP, IPv4 / IPv6 ...

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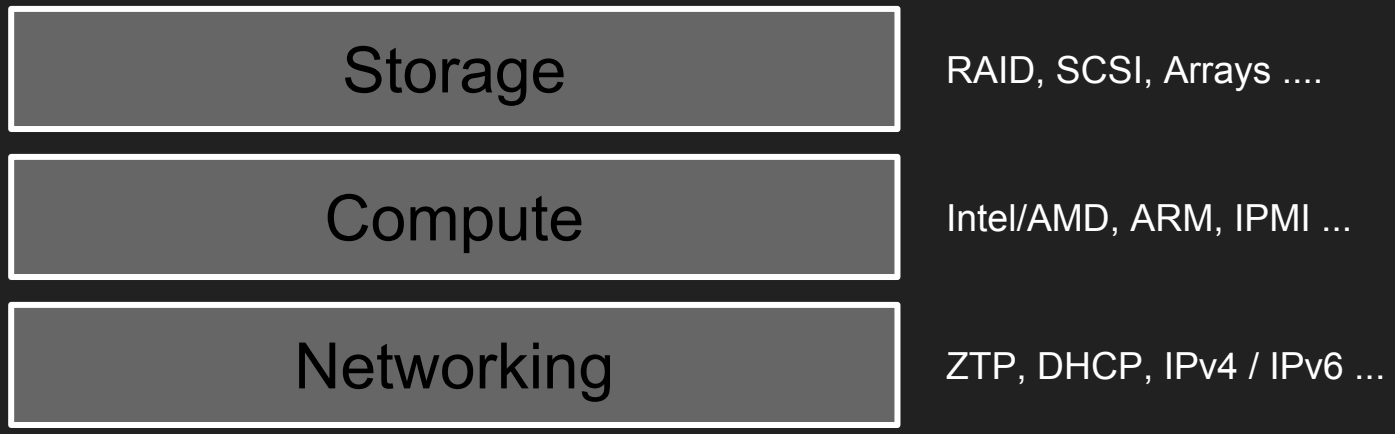
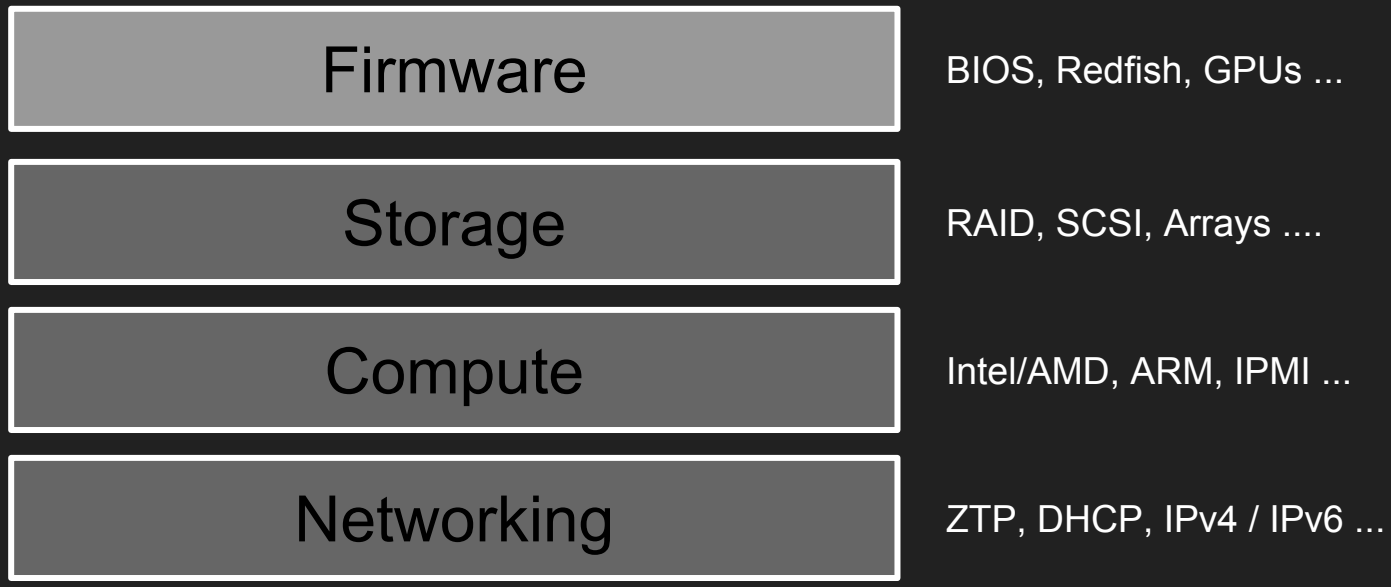

Storage
RAID, SCSI, Arrays ....
Compute
Intel/AMD, ARM, IPMI ...
Networking
ZTP, DHCP, IPv4 / IPv6 ...

RackN


Firmware
BIOS, Redfish, GPUs ...
Storage
RAID, SCSI, Arrays ....
Compute
Intel/AMD, ARM, IPMI ...
Networking
ZTP, DHCP, IPv4 / IPv6 ...

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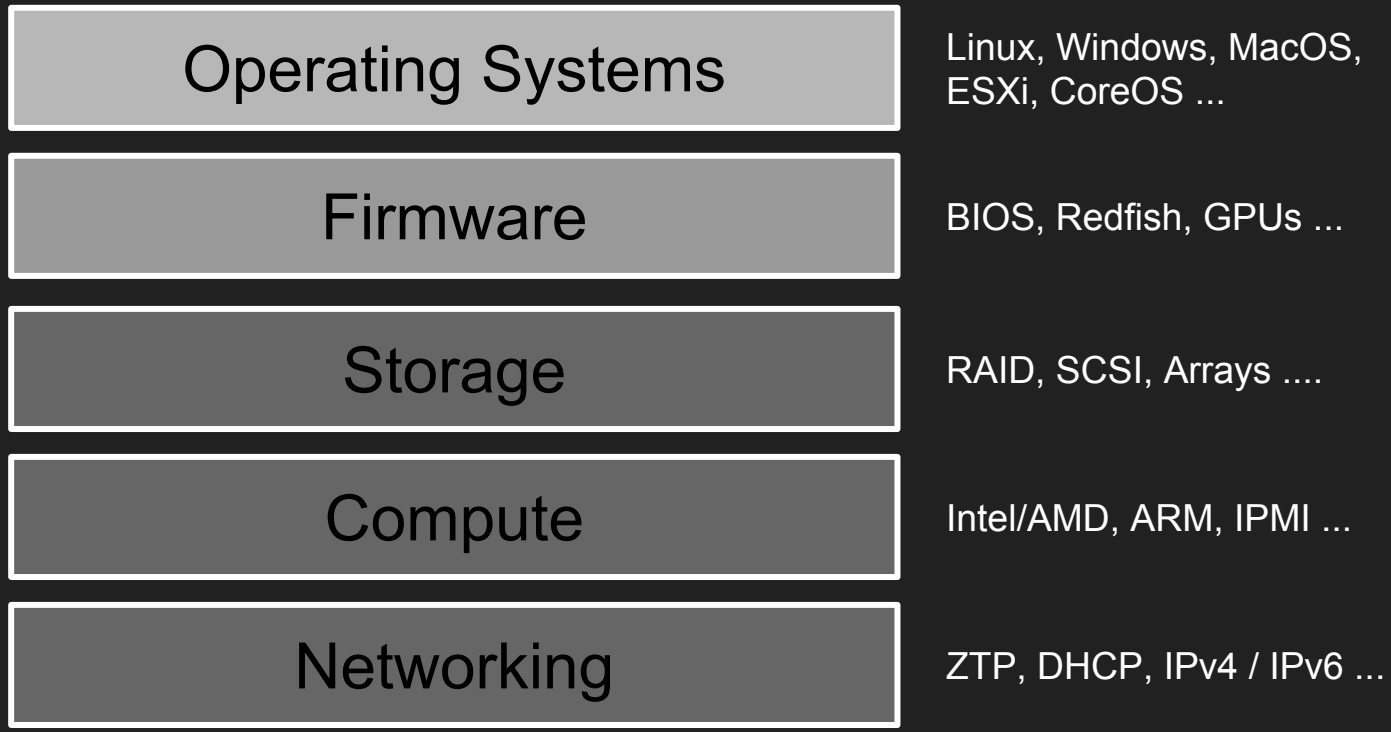
Operating Systems
Linux, Windows, MacOS, ESXi, CoreOS ...
Firmware
BIOS, Redfish, GPUs ...
Storage
RAID, SCSI, Arrays ....
Compute
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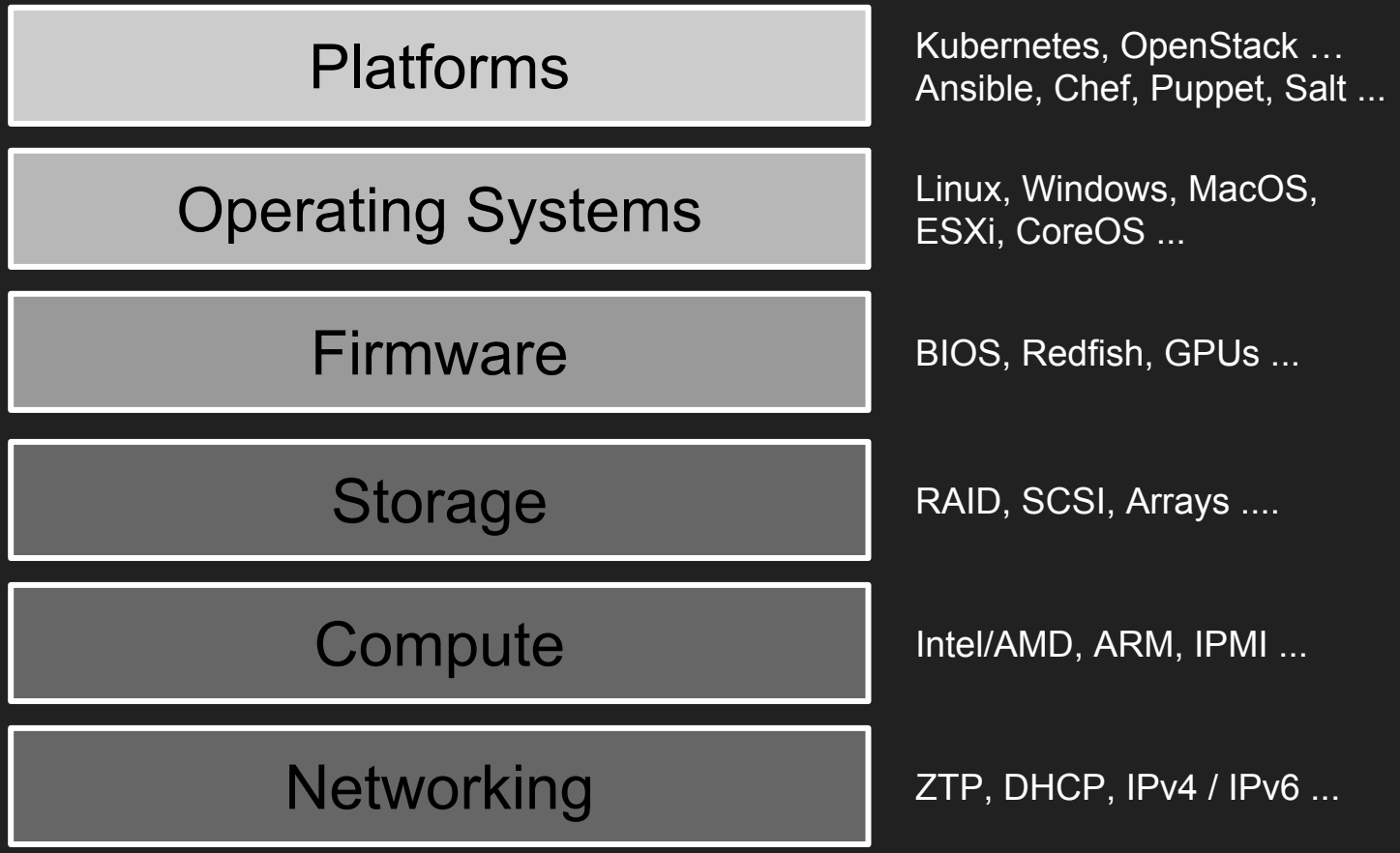
Networking
ZTP, DHCP, IPv4 / IPv6 ...

RackN


Platforms
Kubernetes, OpenStack …
Ansible, Chef, Puppet, Salt ...
Operating Systems
Linux, Windows, MacOS,
ESXi, CoreOS ...
Firmware
BIOS, Redfish, GPUs ...
Storage
RAID, SCSI, Arrays ....
Compute
Intel/AMD, ARM, IPMI ...
Networking
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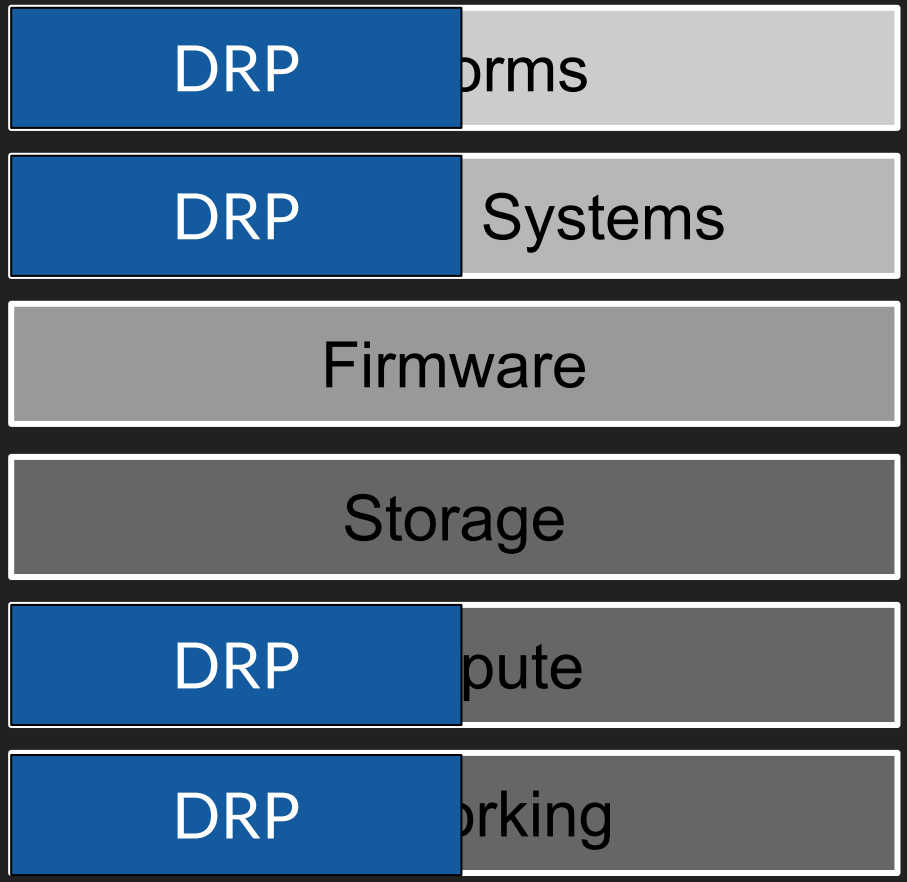

Kubernetes, OpenStack …
Ansible, Chef, Puppet, Salt ...

Linux, Windows, MacOS,
ESXi, CoreOS ...

BIOS, Redfish, GPUs ...

RAID, SCSI, Arrays ....

Intel/AMD, ARM, IPMI ...

ZTP, DHCP, IPv4 / IPv6 ...

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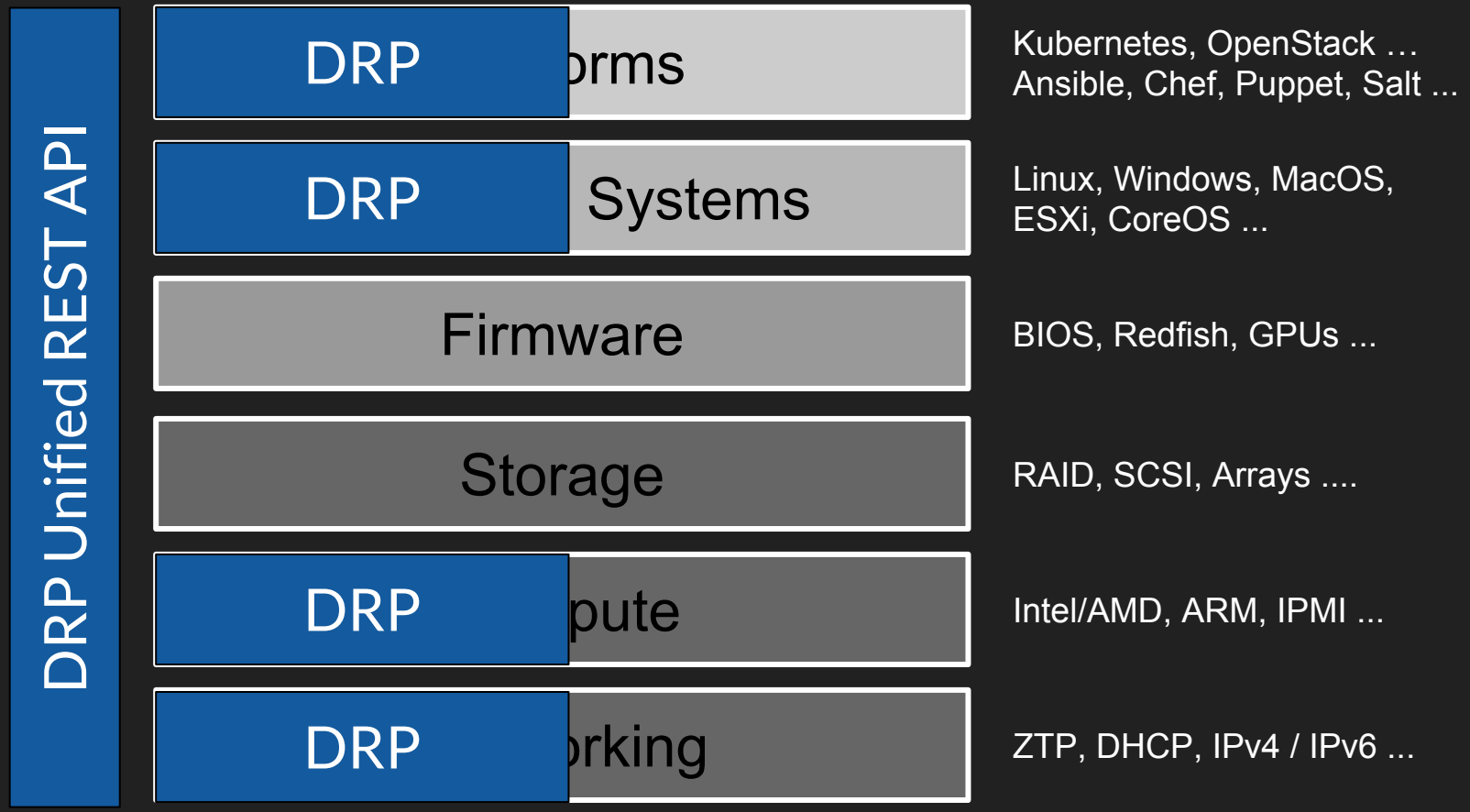
DRP Unified REST API
DRP
orms
Kubernetes, OpenStack …
Ansible, Chef, Puppet, Salt ...
DRP
Systems
Linux, Windows, MacOS,
ESXi, CoreOS ...
Firmware
BIOS, Redfish, GPUs ...
Storage
RAID, SCSI, Arrays ....
DRP
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Intel/AMD, ARM, IPMI ...
DRP
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ZTP, DHCP, IPv4 / IPv6 ...

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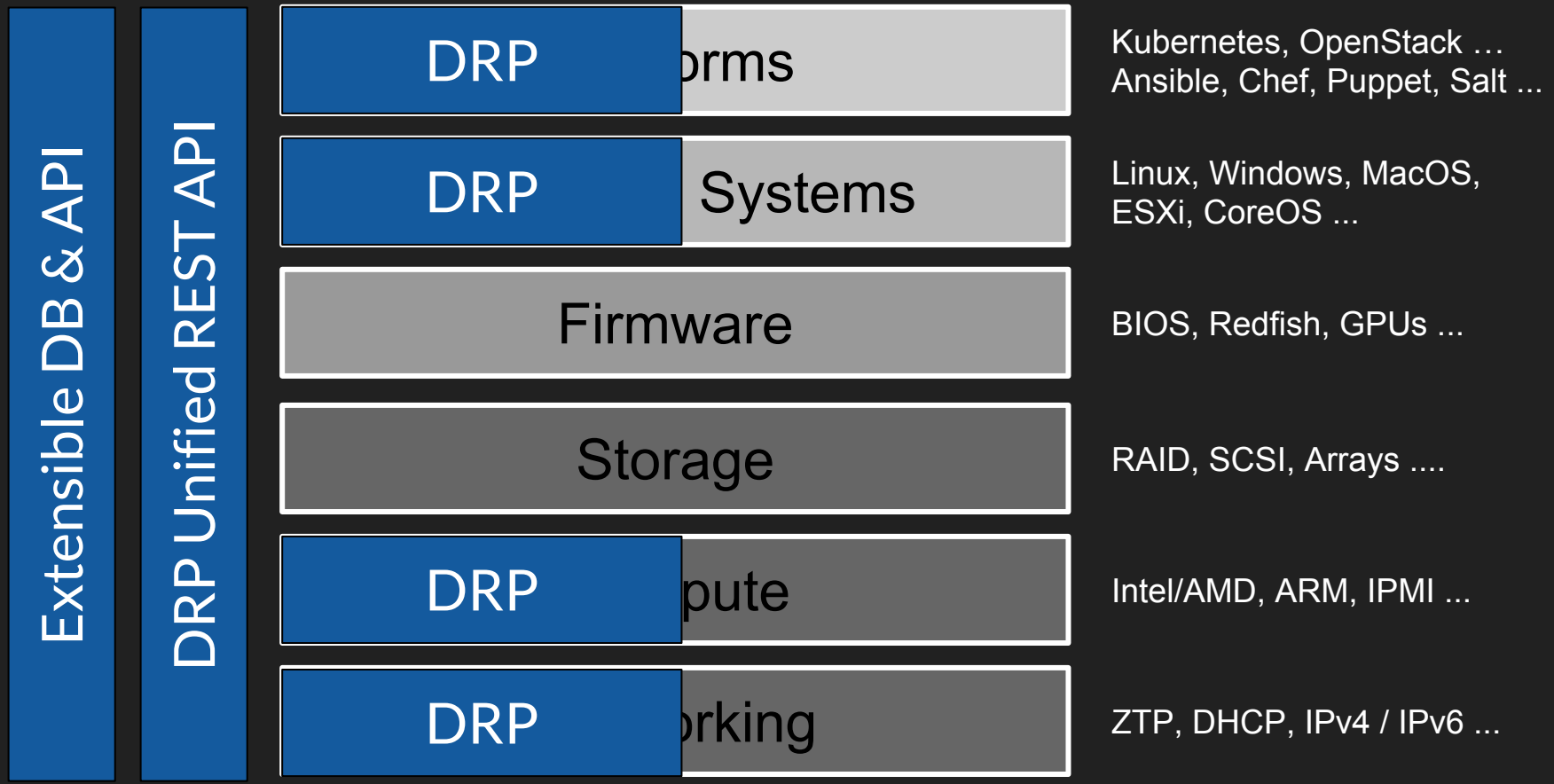
Extensible DB & API
DRP Unified REST API
DRP
orms
Kubernetes, OpenStack …
Ansible, Chef, Puppet, Salt ...
DRP
Systems
Linux, Windows, MacOS,
ESXi, CoreOS ...
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BIOS, Redfish, GPUs ...
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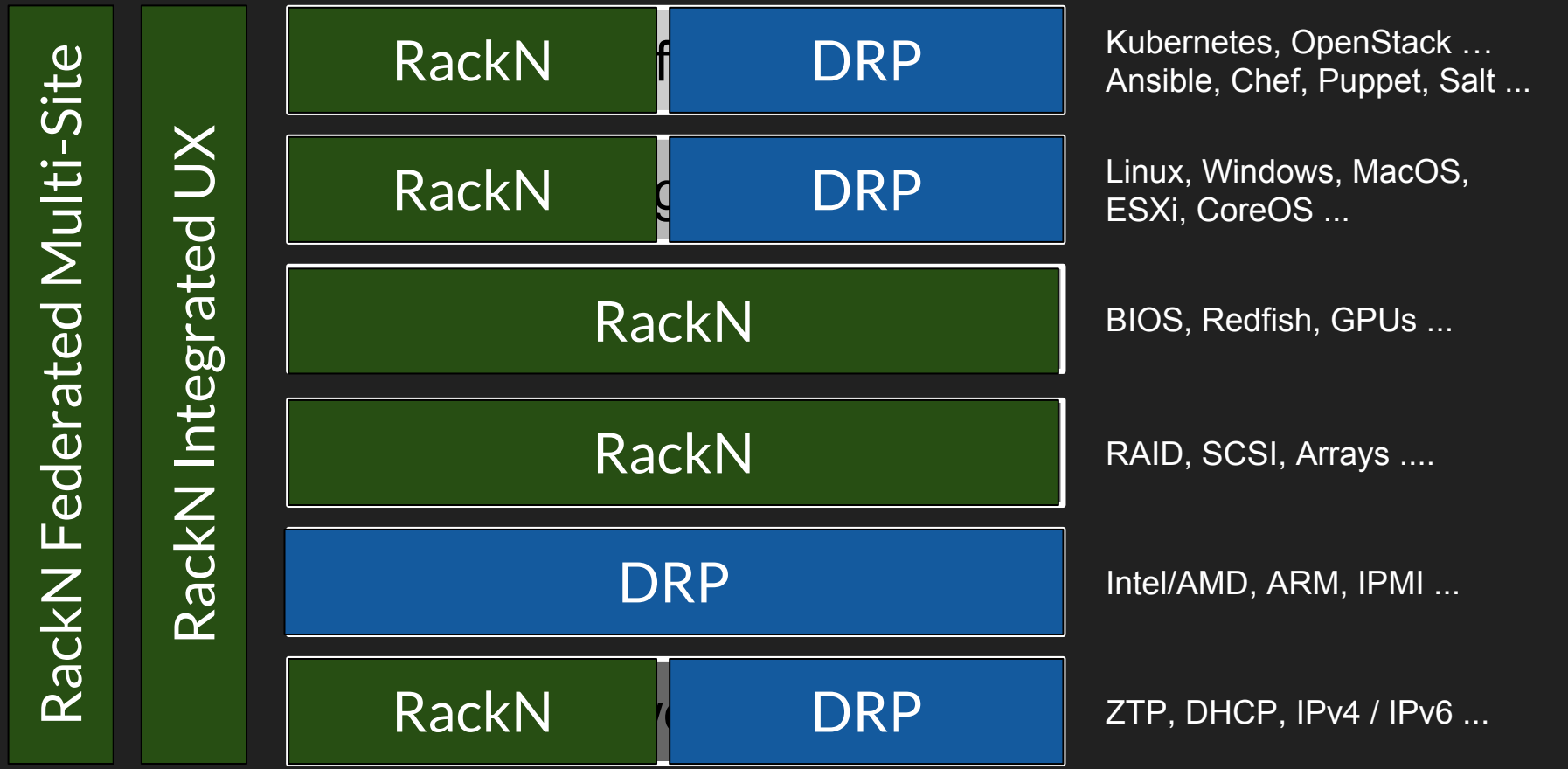
RackN Federated Multi-Site
RackN Integrated UX
RackN
DRP
RackN
DRP
RackN
RackN
DRP
RackN
DRP
Kubernetes, OpenStack …
Ansible, Chef, Puppet, Salt ...
Linux, Windows, MacOS,
ESXi, CoreOS ...
BIOS, Redfish, GPUs ...
RAID, SCSI, Arrays ....
Intel/AMD, ARM, IPMI ...
ZTP, DHCP, IPv4 / IPv6 ...

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1. Fix Root Causes

1. Fix Root Causes
2. Enable Reuse

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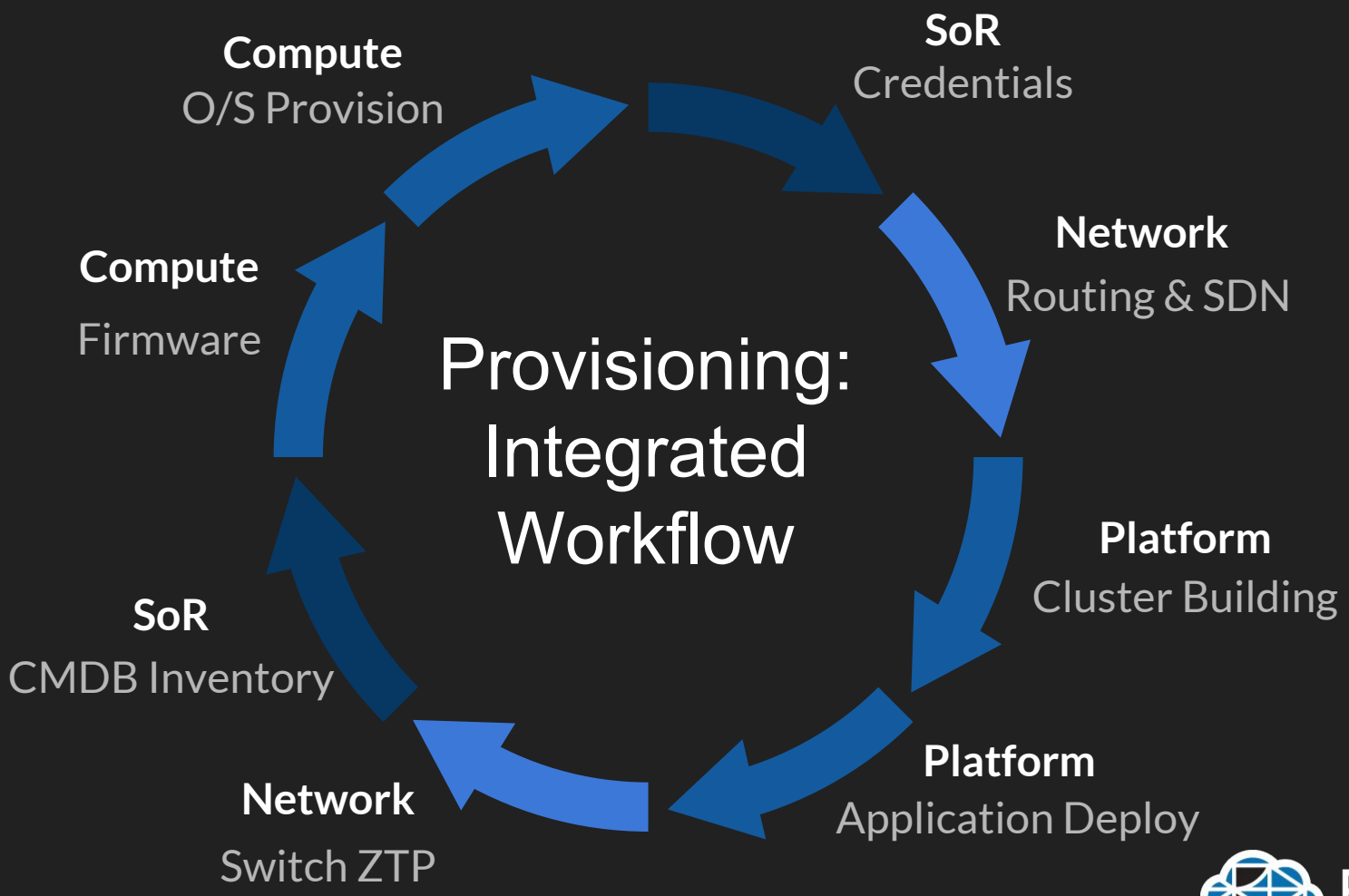
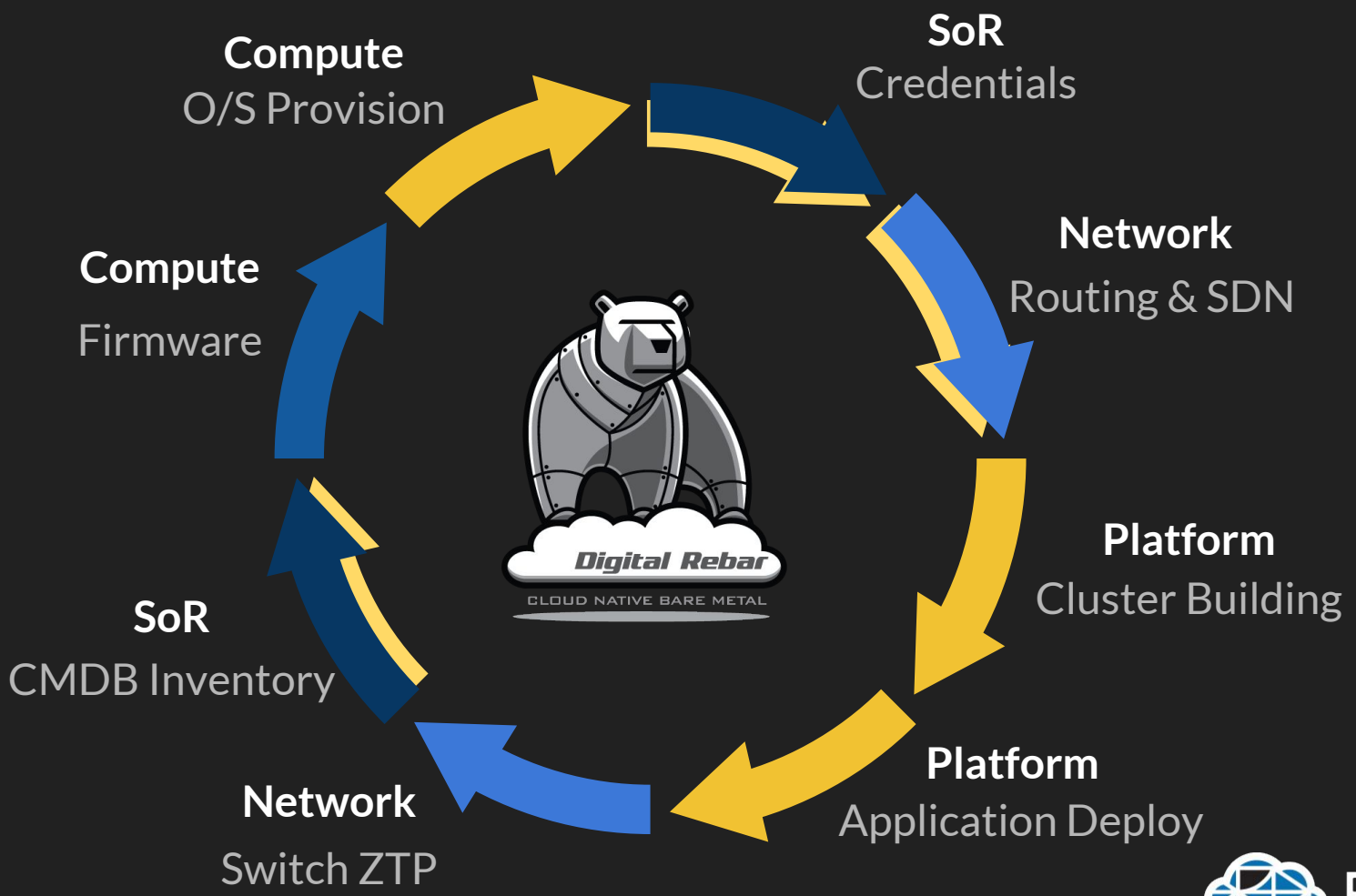
1. Fix Root Causes
2. Enable Reuse
3. Assumed *Hetero*genous

1. Fix Root Causes
2. Enable Reuse
3. Assumed *Hetero*genous
4. Integrated Workflow


Compute
O/S Provision
SoR
Credentials
Network
Routing & SDN
Platform
Cluster Building
Platform
Application Deploy
Network
Switch ZTP
SoR
CMDB Inventory
Compute
Firmware
Provisioning:
Integrated
Workflow

RackN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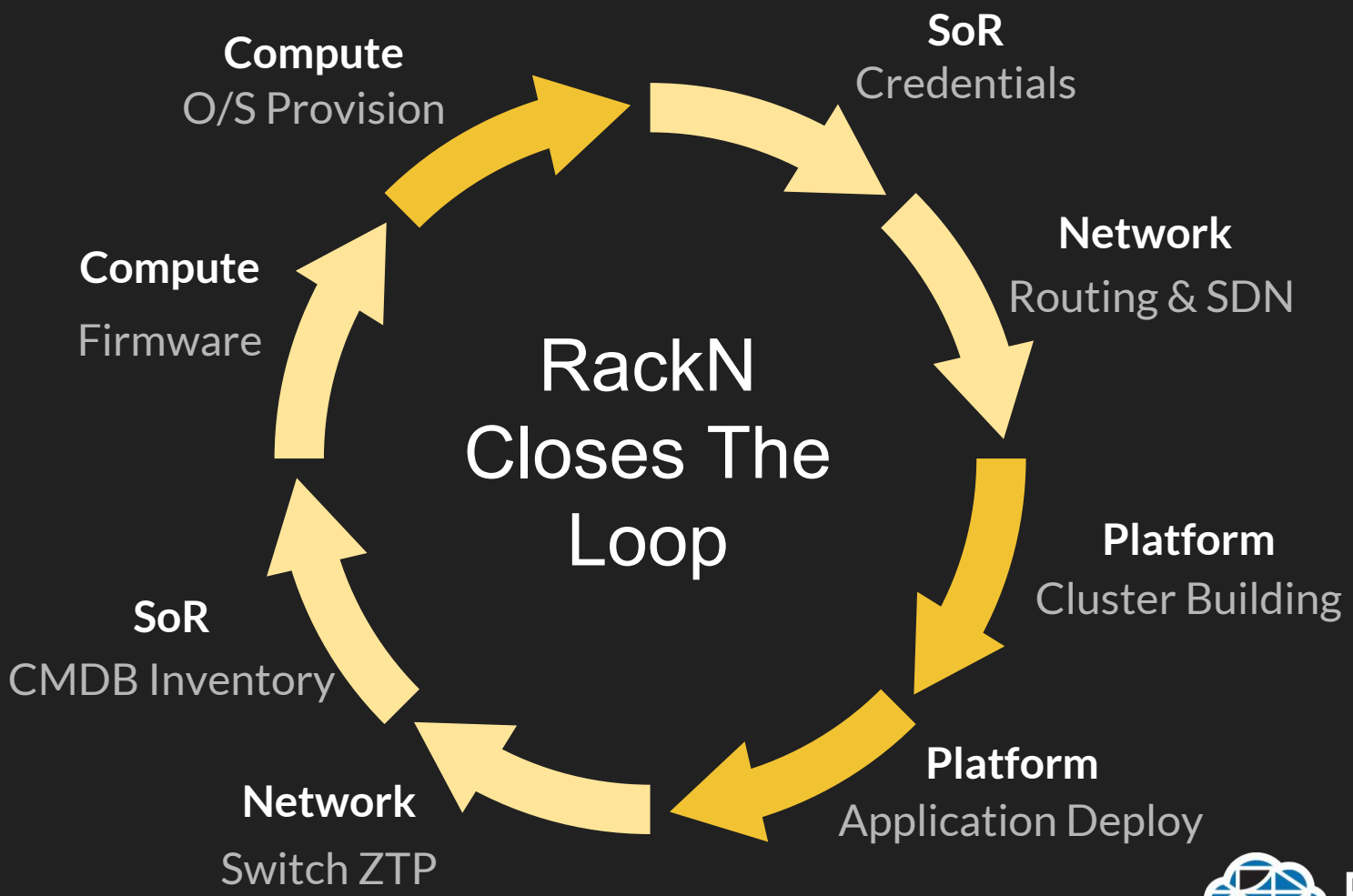
Application Deploy
Network
Switch ZTP
SoR
CMDB Inventory
Compute
Firmware
Digital Rebar
CLOUD NATIVE BARE METAL
RackN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SoR
Credentials
Network
Routing & SDN
Platform
Cluster Building
Platform
Application Deploy
Network
Switch ZTP
SoR
CMDB Inventory
Compute
Firmware
RackN
Closes The
Loop

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Cloud Native Infrastructure

Digital Rebar

- Tiny self-contained footprint
- Single multi-platform Golang binary
- REST API & Event Driven
- Autonomous & “Air gap” capable
- Fast to learn & Simple to manage

Edge Data Center

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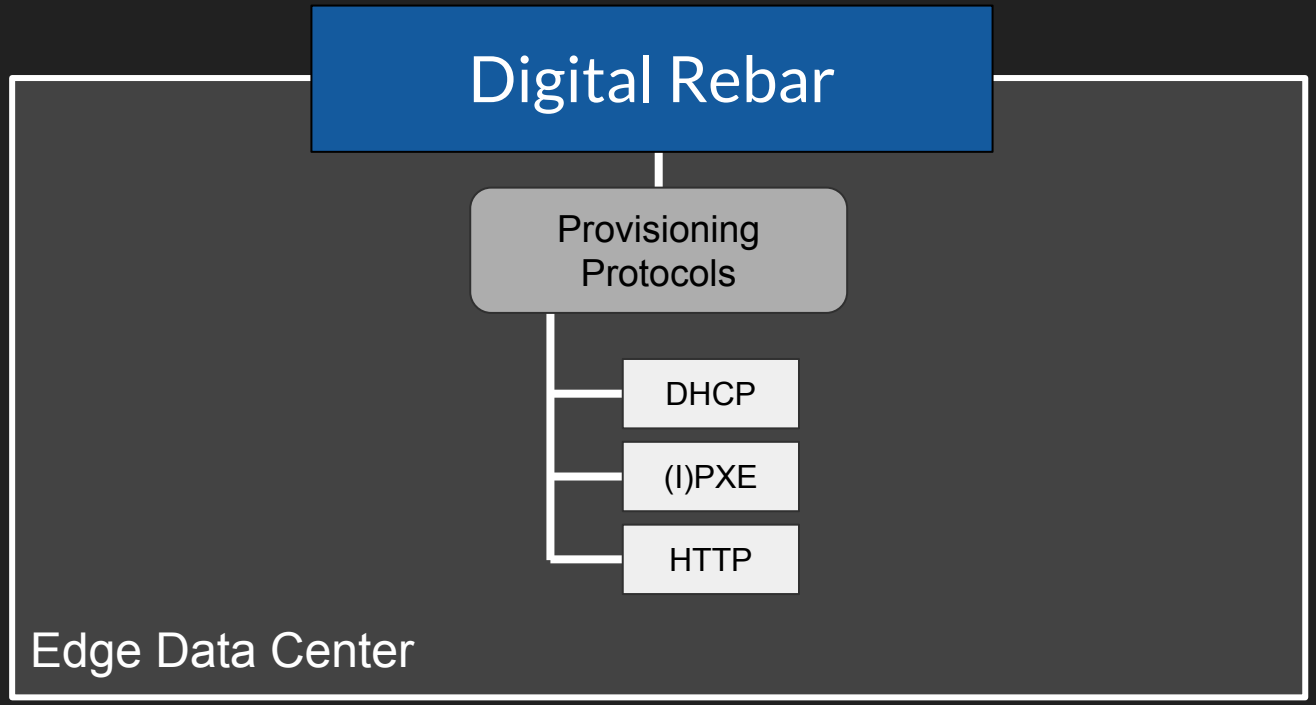
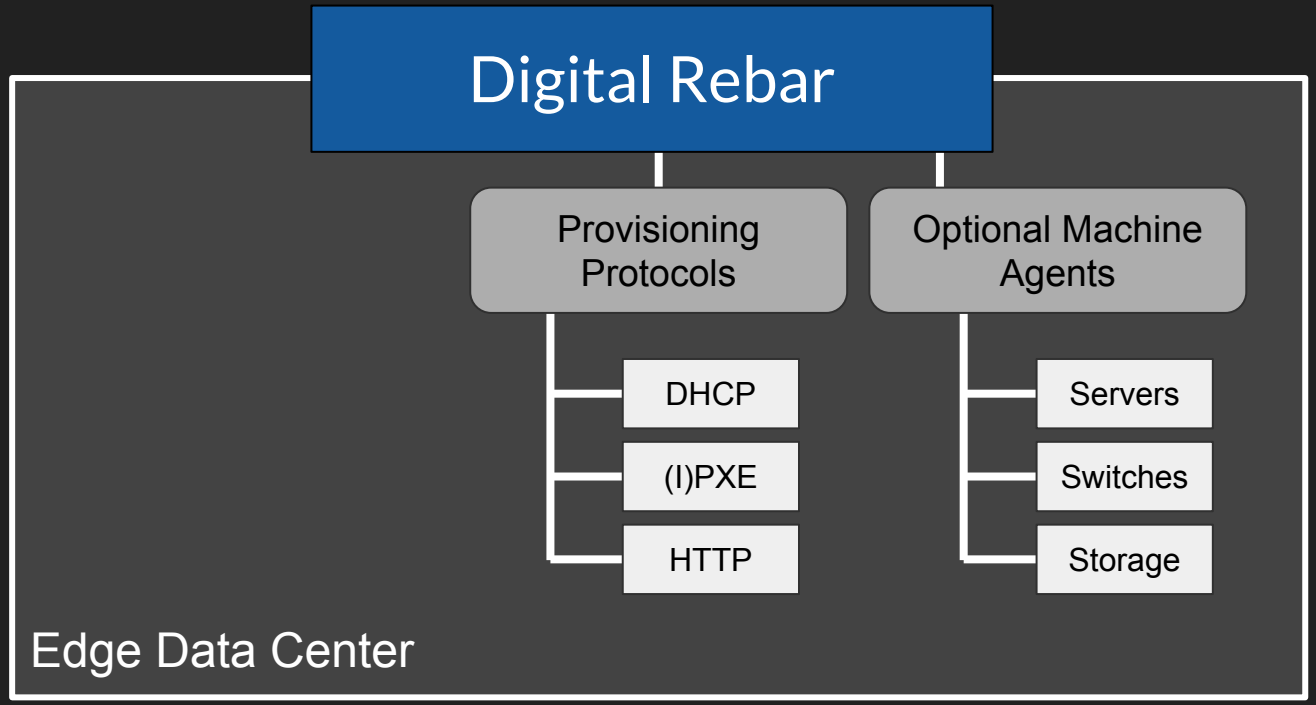
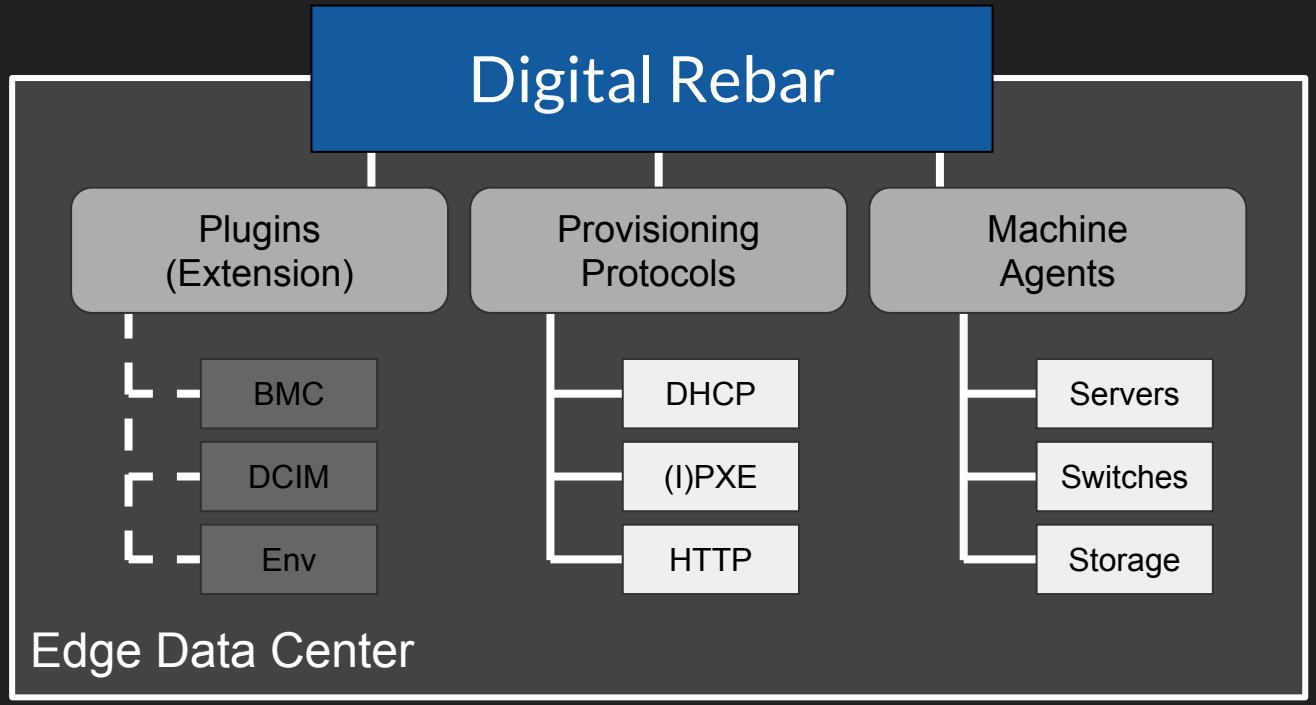

Digital Rebar
Provisioning Protocols
DHCP
(I)PXE
HTTP
Edge Data Center

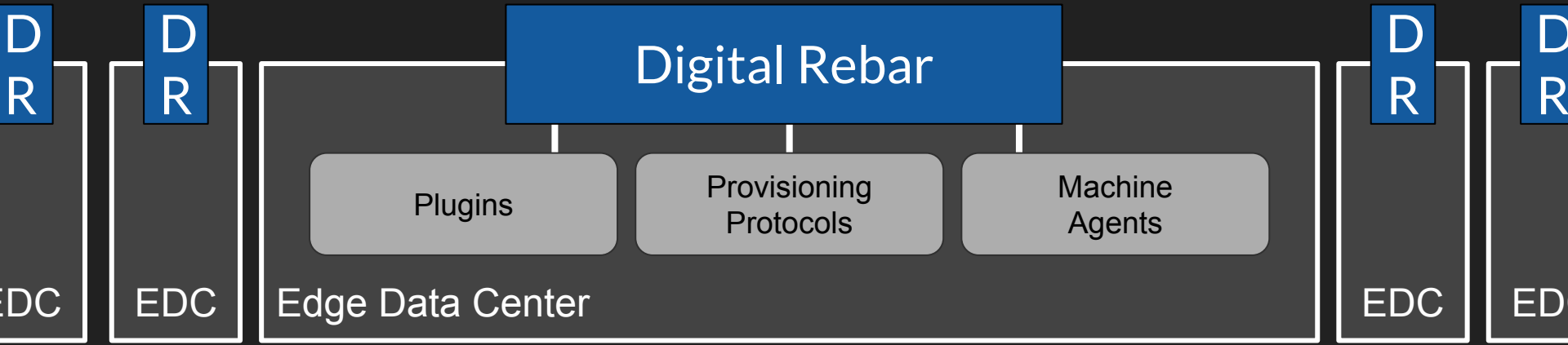
RackN


Digital Rebar
Provisioning Protocols
Optional Machine Agents
DHCP
(I)PXE
HTTP
Servers
Switches
Storage
Edge Data Center

RackN


Digital Rebar
Plugins (Extension)
Provisioning Protocols
Machine Agents
BMC
DCIM
Env
DHCP
(I)PXE
HTTP
Servers
Switches
Storage
Edge Data Center

RackN


D
R
EDC
D
R
EDC
Digital Rebar
Plugins
Provisioning
Protocols
Machine
Agents
Edge Data Center
D
R
EDC
D
R
ED

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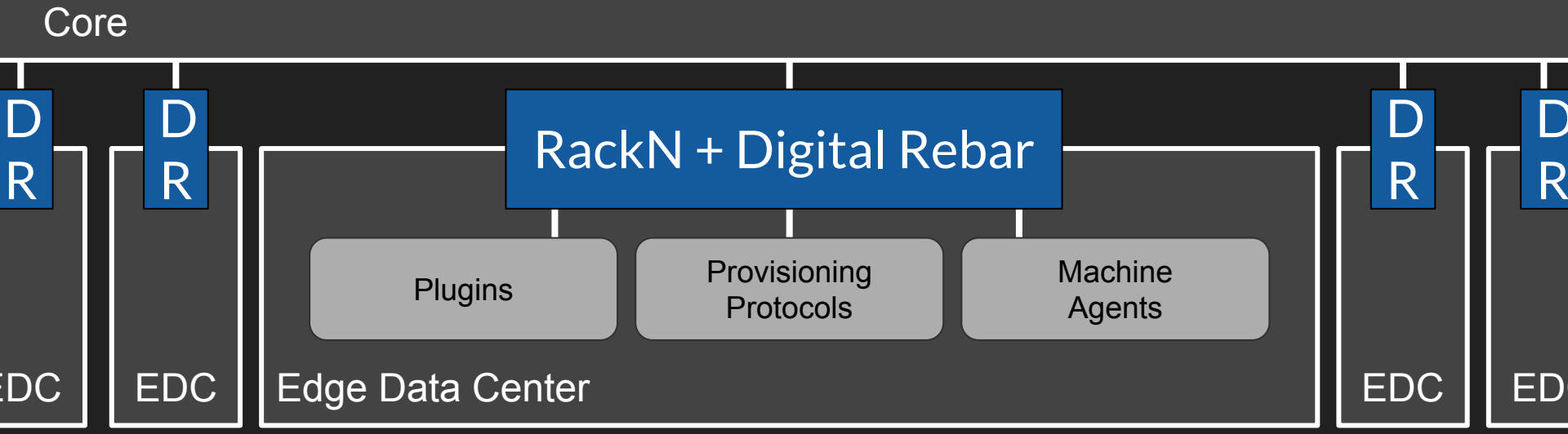
Management Core

Local, Regional or Global
Coordinate and Synchronize
Centralized Management



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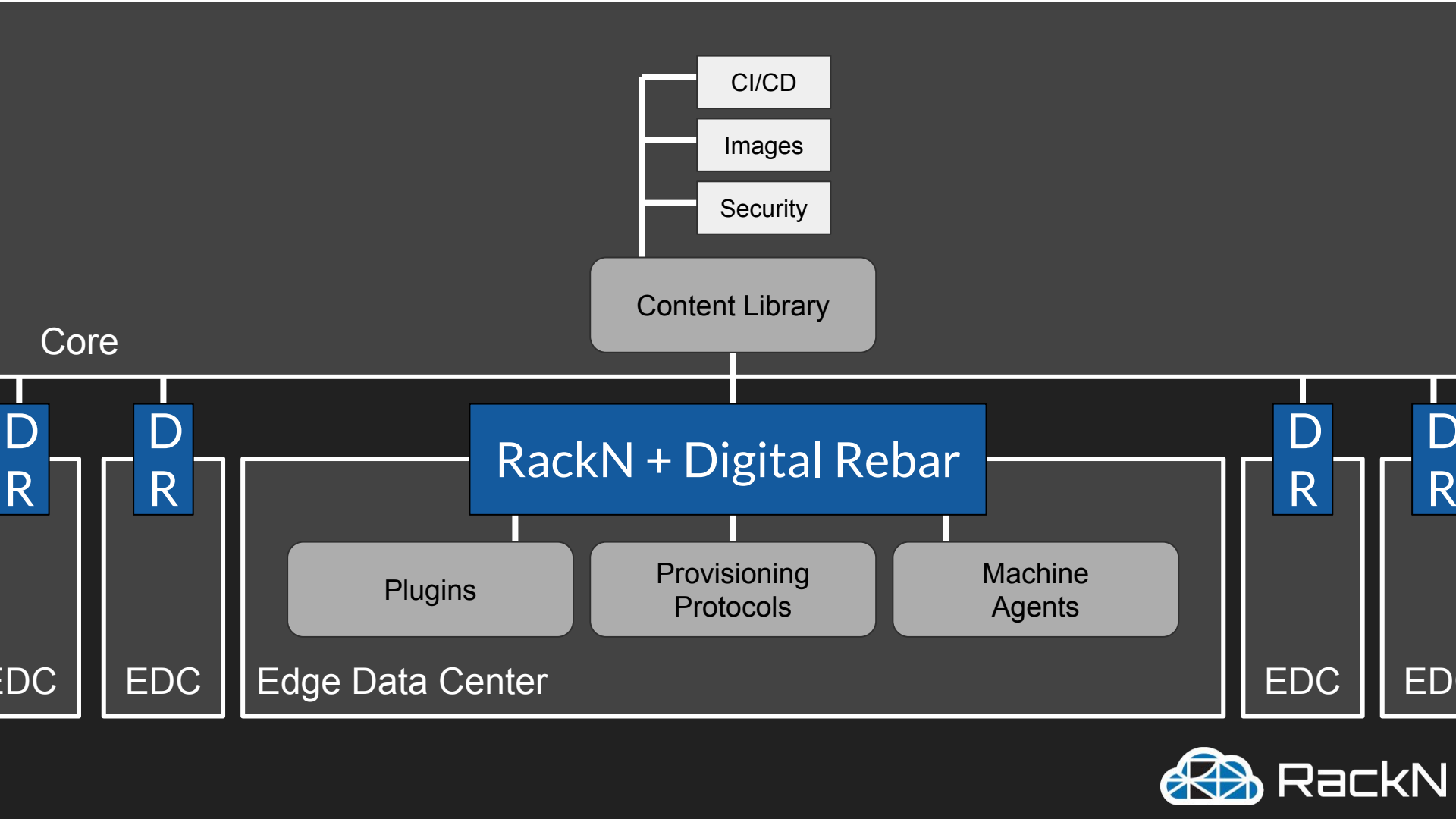
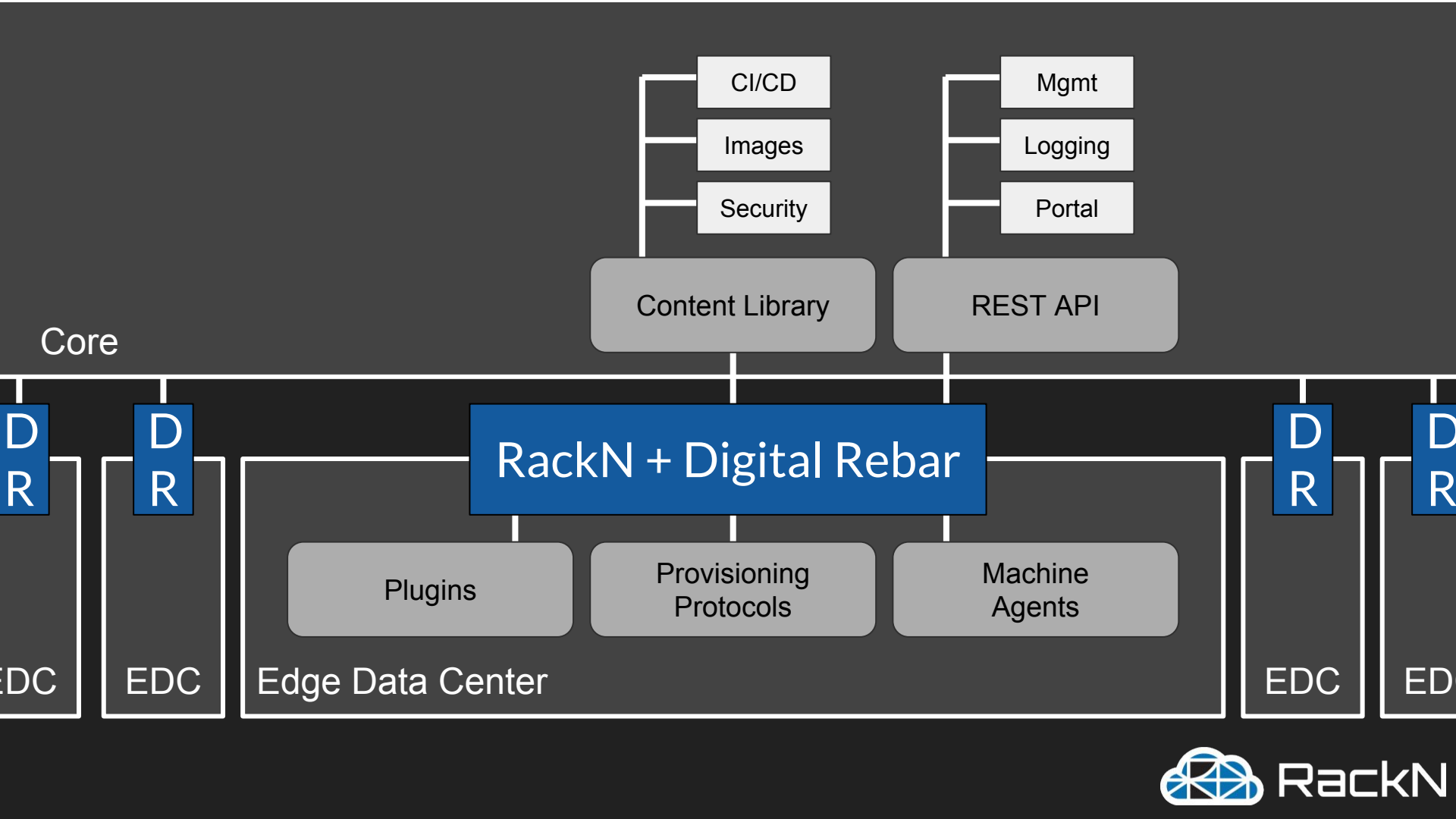

CI/CD
Images
Security
Content Library
Core
D
R
D
R
RackN + Digital Rebar
Plugins
Provisioning
Protocols
Machine
Agents
EDC
EDC
Edge Data Center
EDC
RackN


CI/CD
Images
Security
Mgmt
Logging
Portal
Content Library
REST API
Core
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R
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RackN + Digital Rebar
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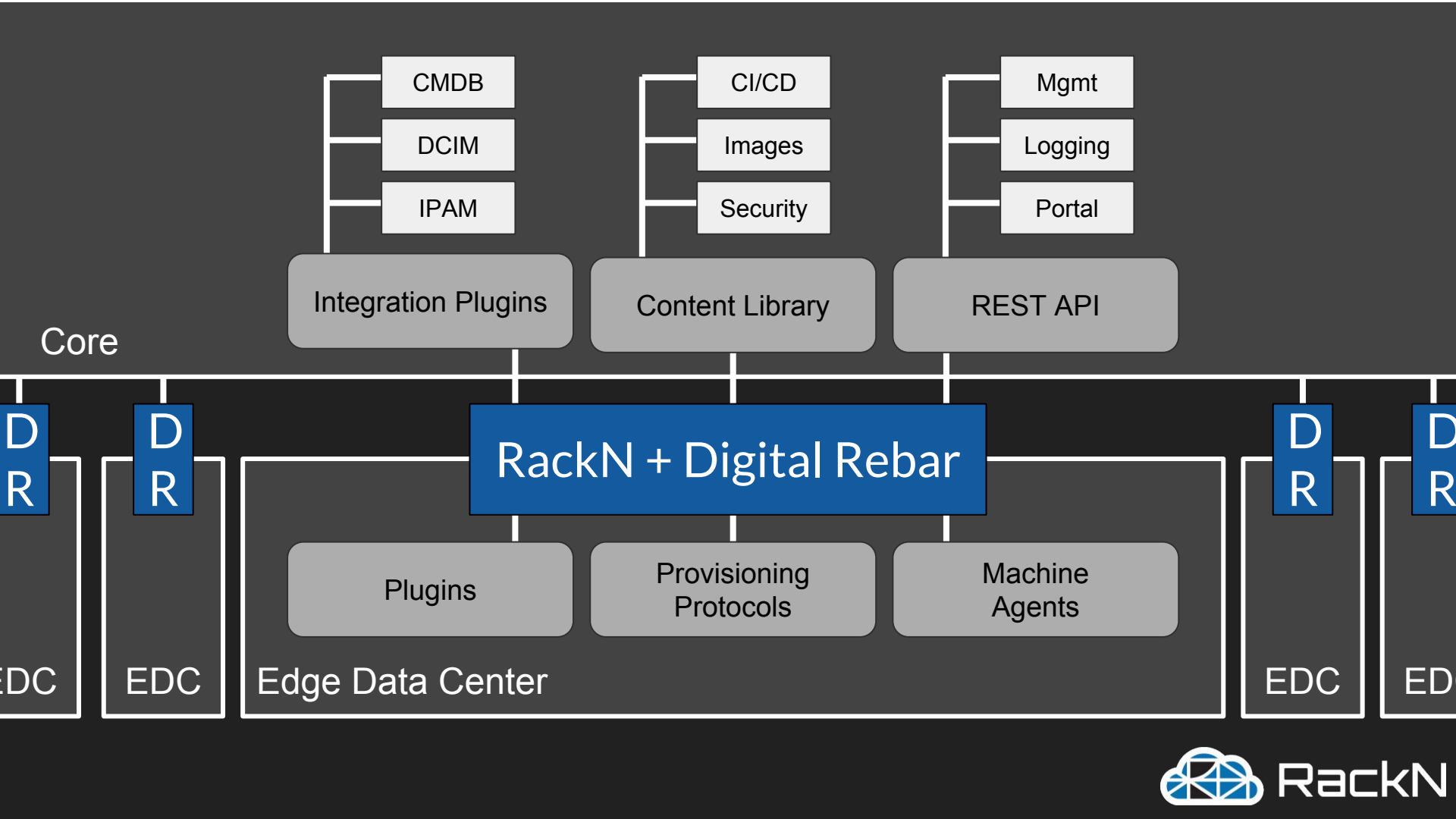
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RackN + Digital Rebar
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R
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Provisioning
Protocols
Machine
Agents
EDC
EDC
Edge Data Center
EDC
RackN

Building Edge Foundations

We design for Edge data centers

Actively building integrated capabilities
Not going solo: we are looking for partners

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Digital Rebar: Innovation for Infrastructure.

Rob Hirschfeld
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