

ShadowNode

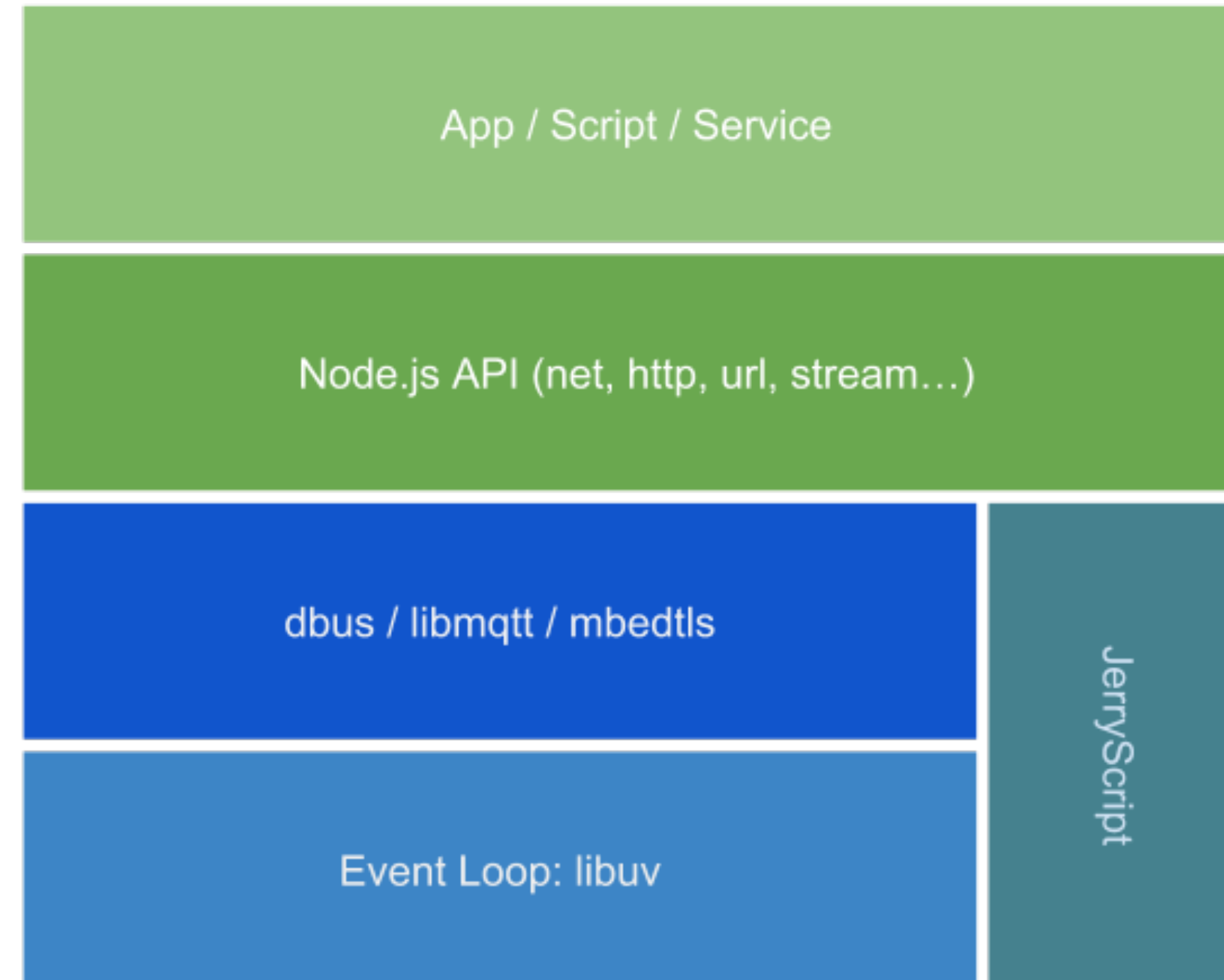
Yorkie @ Rokid

TOC

- What's the ShadowNode?
- What's the design principles of ShadowNode.
- Node.js problems on end device.
- Getting started with ShadowNode.
- Future plans.

ShadowNode
is Node.js for end device

ShadowNode
is **Node.js** for end device



ShadowNode
is Node.js for **end** device



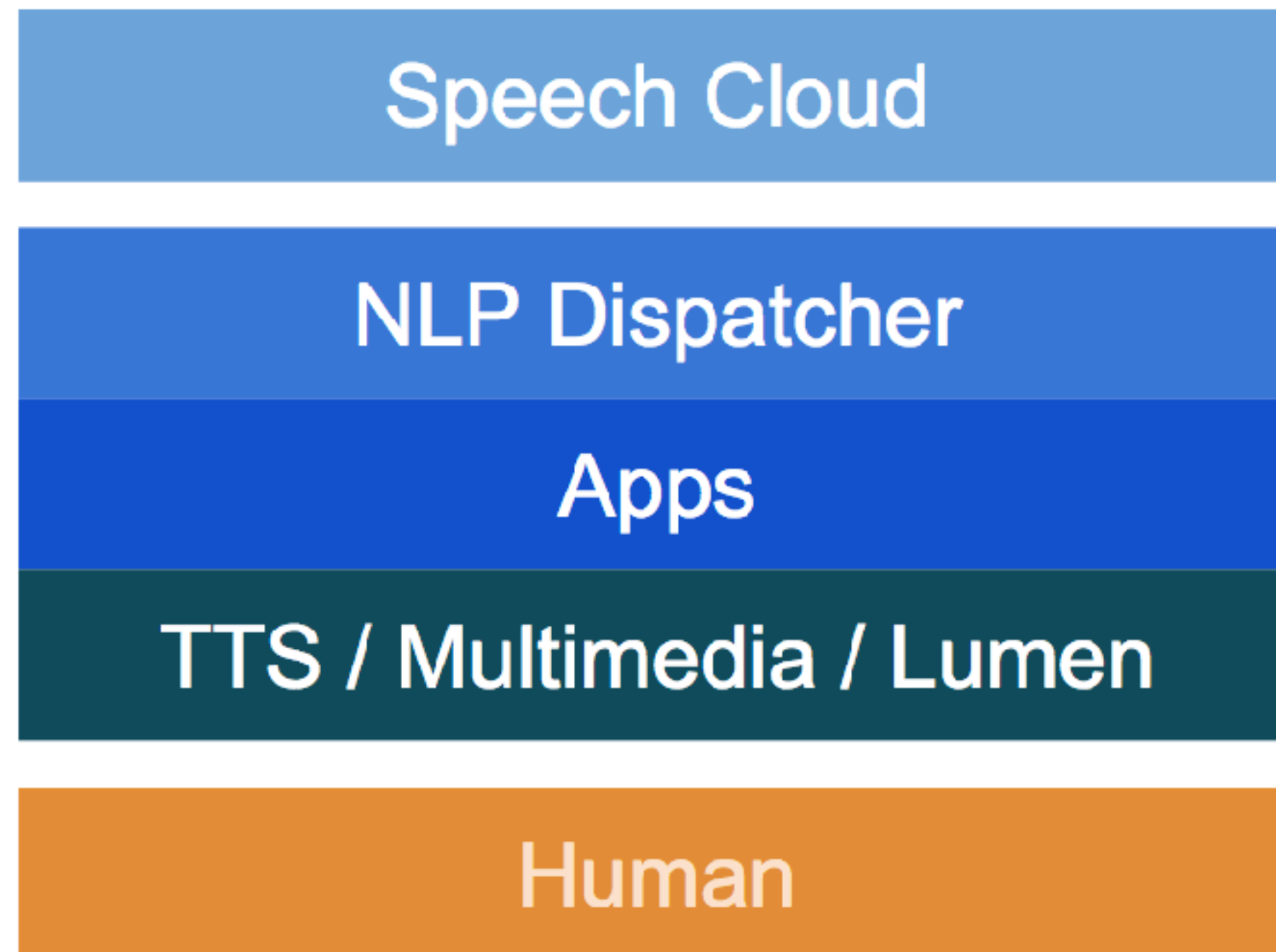
Memory Requirements

	Memory	Disk	CPU
Smart Phone	4GB	SD Card	8 Core
Raspberry Pi	1GB	SD Card	4 Core
Rokid Mini	256MB	256MB	4 Core
X	128MB	128MB	1 Core

**Why choose
JavaScript?**

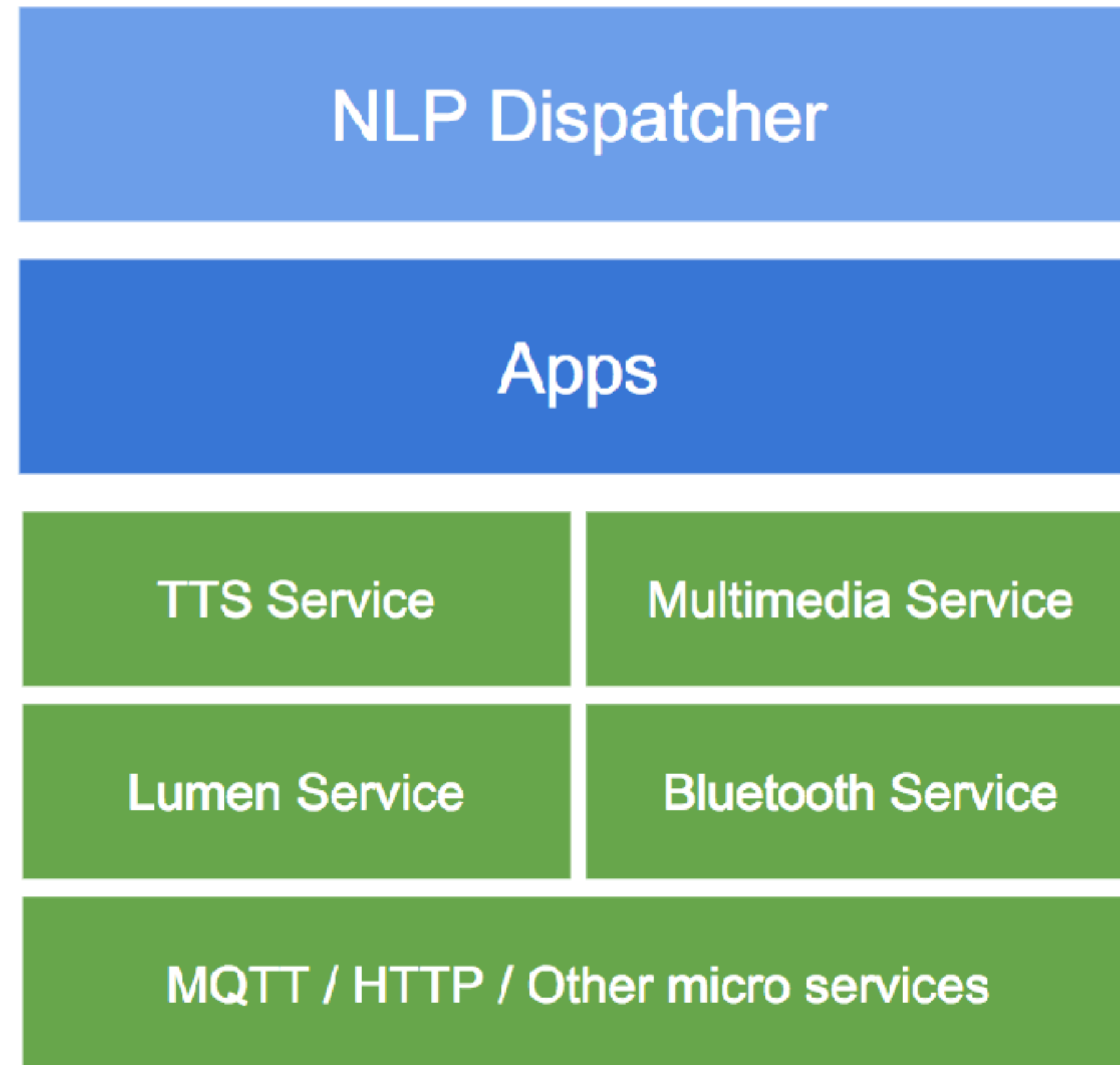
**Why choose
JavaScript?**

Voice User Interface



```
{  
  "intent": "open_light",  
  "slots": {  
    "color": "red",  
    "room": "work"  
  }  
}
```

Voice User Interface



Code

```
const app = vui();

app.use(async (req, res, next) => {
  console.log(req.intent, req.slots);
  await next();
  console.log(`process ${req.intent} done`);
});

app.use('/music', async (req, res) => {
  if (req.intent === 'play') {
    await res.say(`Just play ${req.slots.song} for you`);
    await res.play(req.slots.songUri);
  } else if (req.intent === 'stop') {
    await res.say('Music stopped');
  }
});

app.start();
```

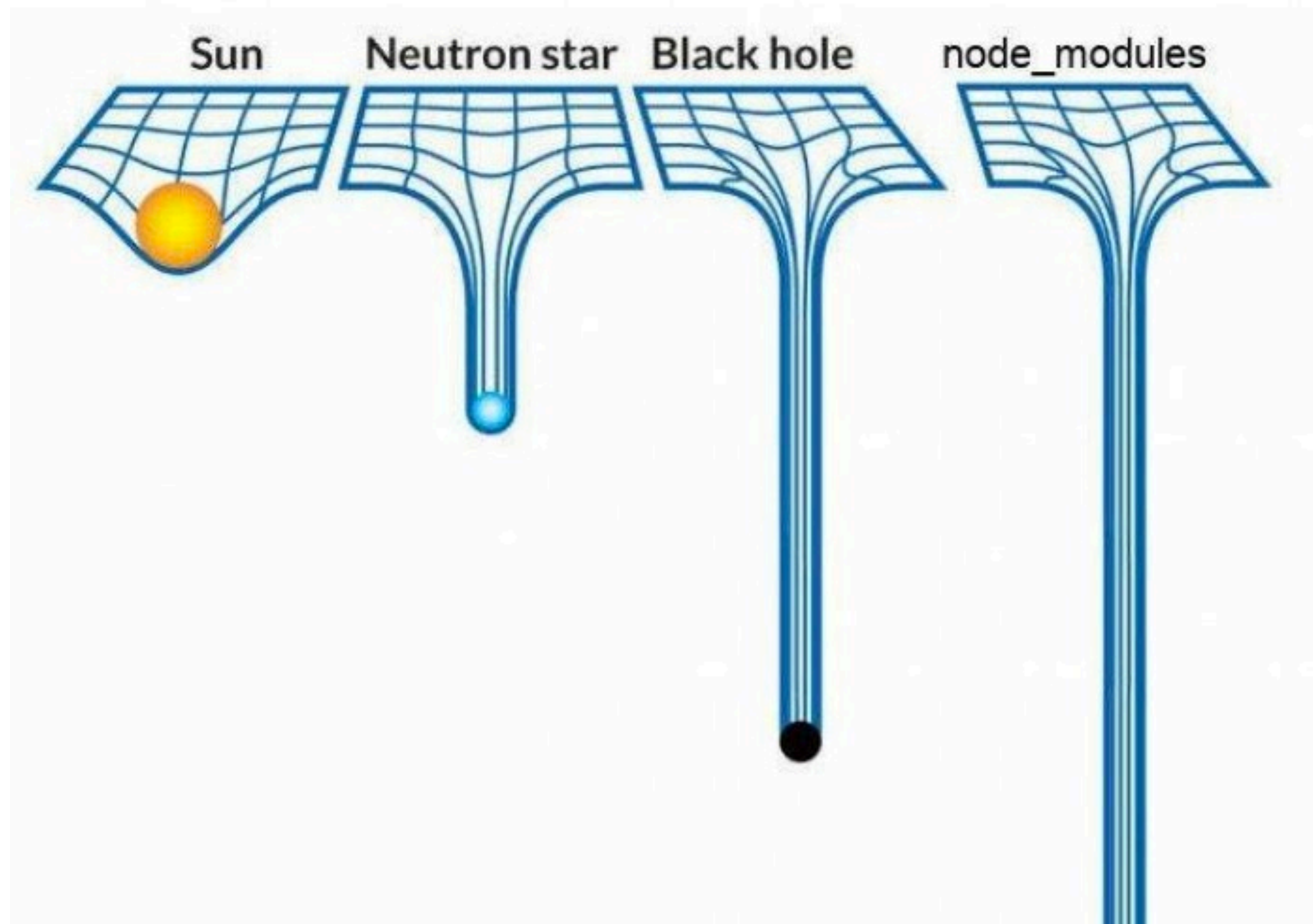
Why ShadowNode?

Design Principles

- Introducing the Node.js workflow into end-device development.
- Easy to write app with steady memory & performance.
- Allowing NPM modules but not recommend abusing.

Why not Node.js?

node_modules hole



A little story about code opts...

Optimization tips

- Shell is better than API sometimes.
- Rewrite huge-size modules in C, but keep consistent APIs for developers.
- Memory-friend modules should be used.

ShadowNode vs. Node.js

Runtime	Memory	Disk
Node.js	70MB	110MB
ShadowNode	15MB↓	20MB↓

- V8 engine does good, but not for end-device.
- NPM does good, but still not for end-device.
- Node.js ecosystem should be still working with end-device.

Getting started with *ShadowNode*

Modules

- Core: *Assert / Buffer / Child Process / Crypto / DNS / Events / File System / HTTP / Module / Net / OS / Process / Stream / Timers / TLS / Datagram.*
- IPC: *D-Bus.*
- Network: *WebSocket / MQTT.*
- Hardware: *ADC / GPIO / UART / I2C.*

[rokidos-www/server/index.js](#)

C/C++ Add-ons

Write a native module

- Gyp is not available, we ❤️ CMake & Makefile.
- Use simpler [JerryScript API](#) to replace V8.
- `NODE_MODULE(mod, Init)`.
- We hope N-API is working on ShadowNode.
- See the [demo](#) program.

Build ShadowNode

[git@github.com:Rokid/ShadowNode.git](https://github.com/Rokid/ShadowNode)

Build ShadowNode

- `tools/build.py`
- `tools/build.py --tests`
- `tools/build.py --install`
- `tools/build.py --help`

Future Plans

“Milestones”

Version	Features	Milestone
0.9.x	N-API / FFI / Sandbox	July 26, 2018
0.10.x	HeapDump / CPU Profiling	Aug. 26, 2018
0.11.x	Chrome Debug Protocol / Async Hooks / HTTP2	Sep. 26, 2018
1.0.x	Hardware API	Oct. 26, 2018

Team Members



[lolBig](#)



[algebrat](#)



[吞吞](#)

One More Thing

Rethinking Node.js

- Sandbox is such **important**.
- **Closer** to Web API.
- N-API & FFI is for JavaScript developers, still the API is needed for **C/C++** without any JavaScript.

Thanks

<git@github.com:Rokid/ShadowNode.git>