ROSHub And You

The Robotics Cloud: A Case Study

https://roshub.io/roscon

What is ROS?

"A dwarf on a giant's shoulders sees farther of the two"
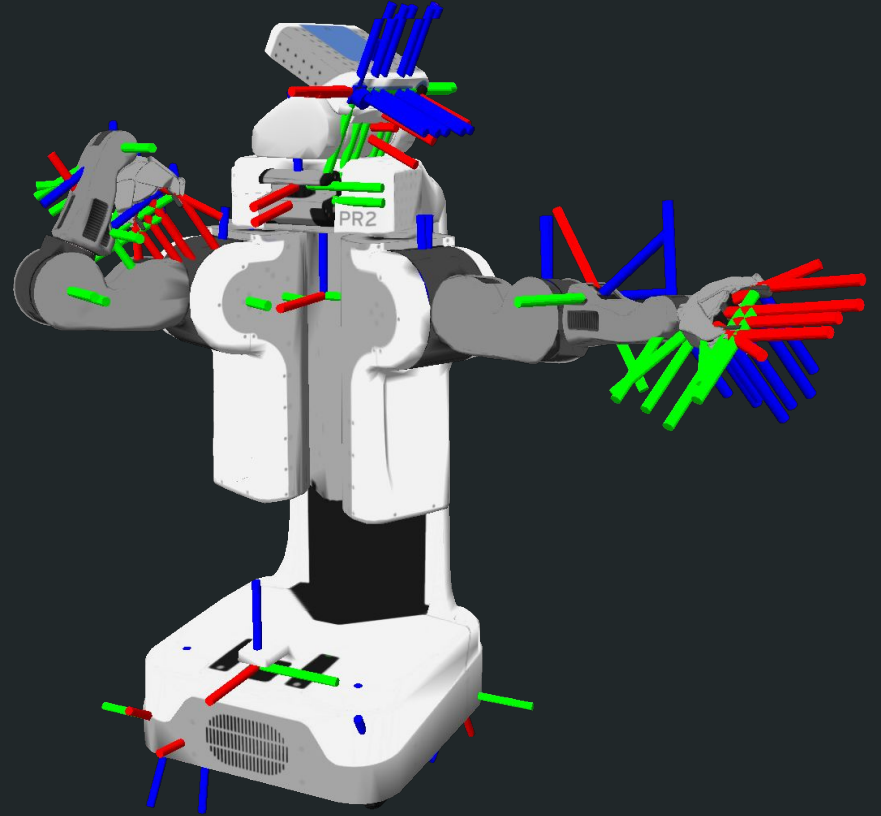
ROS Features

Communication	Generic Robot API	Tools
- Infrastructure - Computation - Topics - Services - Parameters	- Standardized Data Formats - Robot Geometry - Robot Modeling - Diagnostics - Navigation	- Visualization - Simulation - System Analysis - Data Logging - Packages

ROS Key Players

Design Patterns

ROS Design Patterns

Best Practices

- Tests in simulation
- Model robot as URDF
- Composible `.launch`
- `Action` oriented systems

Composable Modules

- Domain specific libraries
- Wrap libraries as ROS packages
- Generic Nodes
  - Unix design principles

Optimizations

- Custom hardware communication
- Nodelets
- Hardware acceleration

ROS Limitations

ROS Limitations

Security

- No Users
- No Authentication
- No Authorization
- Not safe on open networks
- Not safe on public internet
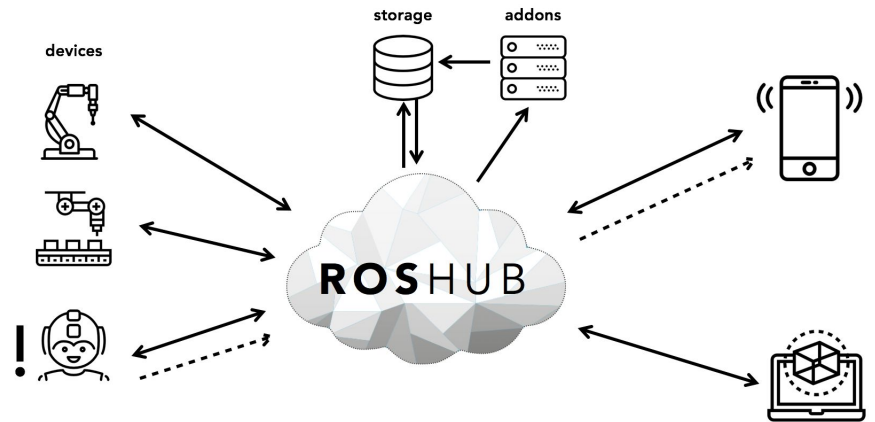
Management

- No remote management
  - Code
  - Deploy
  - Update
  - Configure
- No cloud support
- Organizational delegation
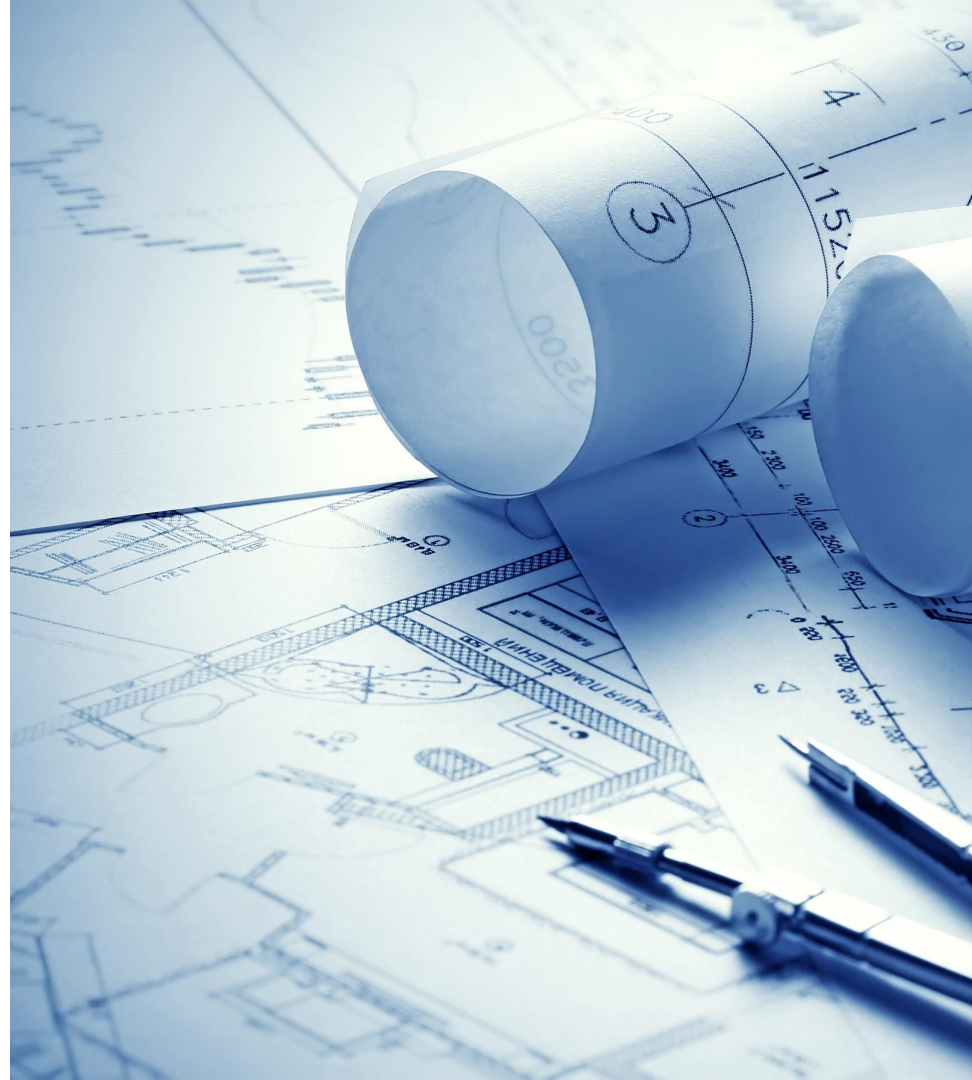- No mobile apps

Operations

- Remote monitoring
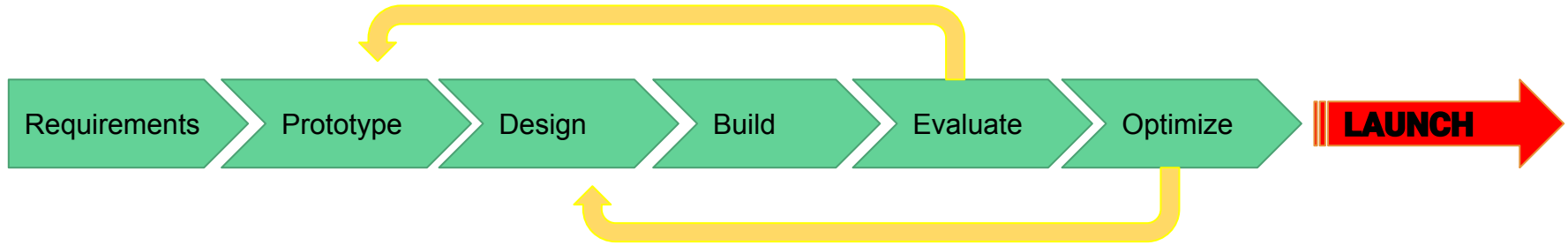- Success/Failure

The solution

- ❖ Teleoperation
- ❖ Device Management
- ❖ Process Management
- ❖ Fleet Management
- ❖ Simulation
- ❖ Data Analytics
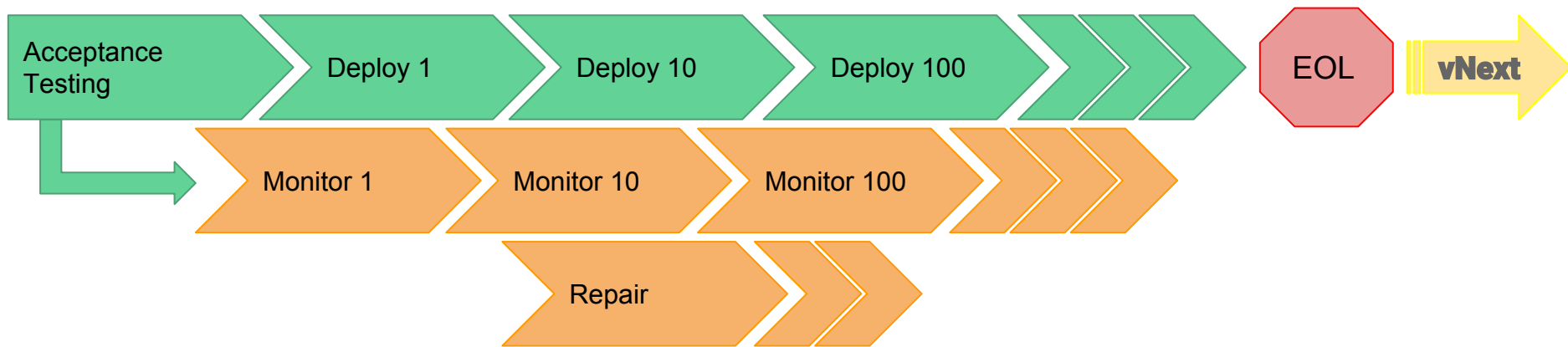- ❖ 3rd Party Integrations

Engineering

Engineering

Requirements → Prototype → Design → Build → Evaluate → Optimize → **LAUNCH**

Parallel Paths

- Product
  - Hardware
  - Electrical
  - Firmware
  - Software
- Support
  - Deployment
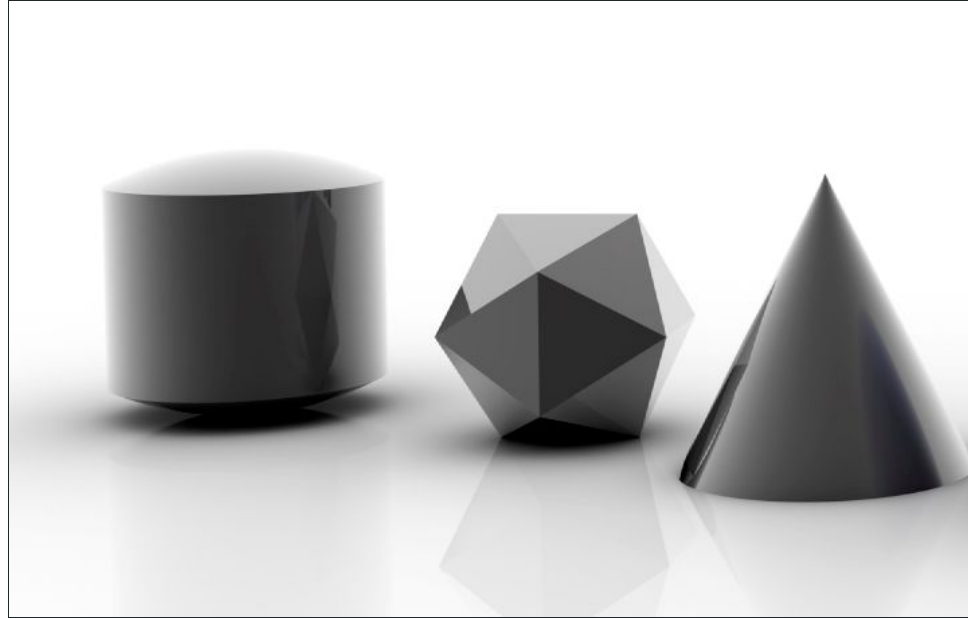 - Monitoring
  - Repair

Operations

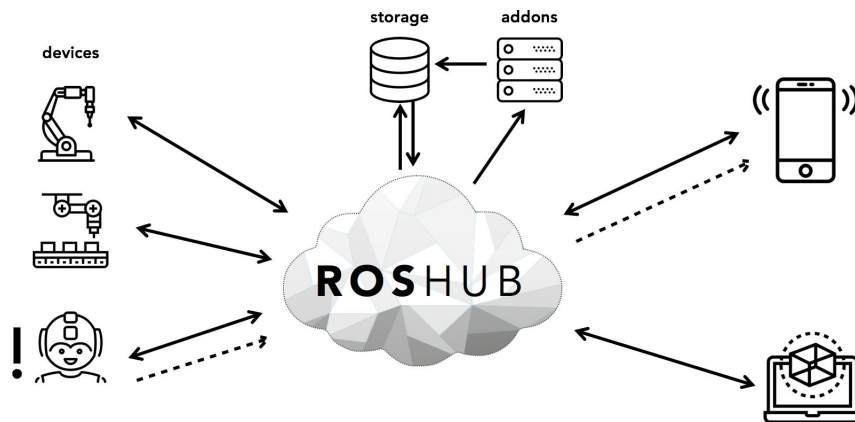# Operations

Product Line Management

Product Line Management

❖ Same product different SKUs?
❖ Product line refresh cycles?
❖ Total different products
❖ Concurrent product support operations

Feature Roadmap

Feature Roadmap

- ❖ Teleoperation ✔
- ❖ Device Management ✔
- ❖ 3rd Party Integrations ✔
- ❖ Process Management
- ❖ Fleet Management
- ❖ Simulation
- ❖ Data Analytics

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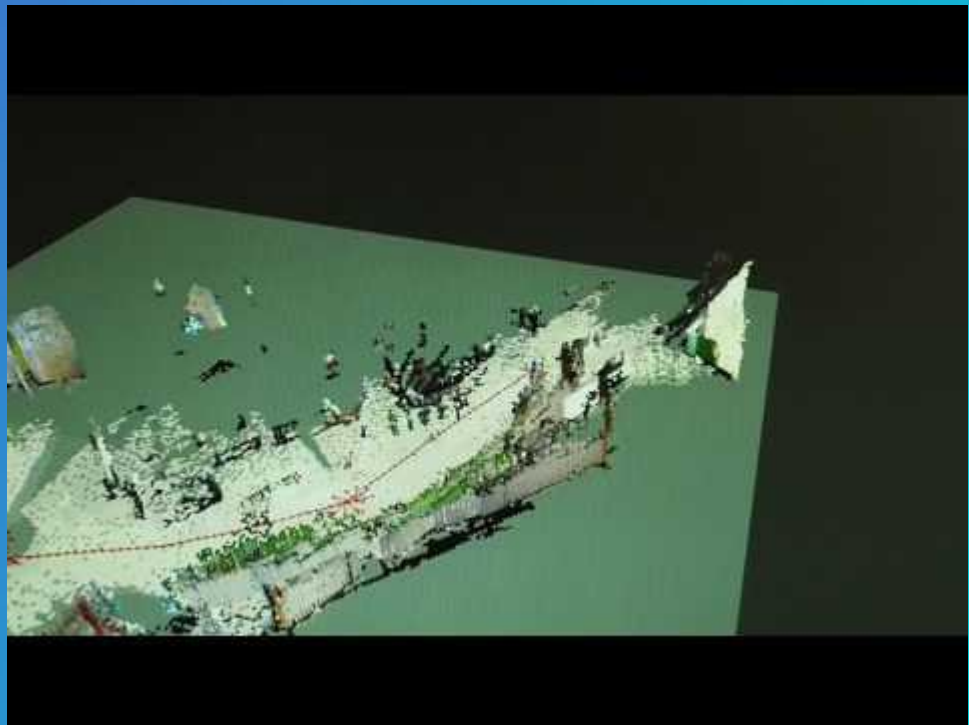
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https://www.youtube.com/watch?v=4nTWZwGRUwA