# New Space Challenges

Too many **custom/fixed** solutions to **counter threats** and market **demands** at a **relevant** pace

**Development Time**

Exquisite **"one off"** solutions drive up costs. We must be able to **leverage** common elements to **lower** application **deployment costs**

**Systems Costs**

**AI** on orbit increases the ability to **reduce latency** for items like **image identification** & **position assistance**

**Artificial Intelligence**

**Space Operations**

Space **supply chain disruption** is a major risk due to **shrinking** supply base for **advanced RH microelectronics**, **precision**, **gears**, **motors**, and **optics**
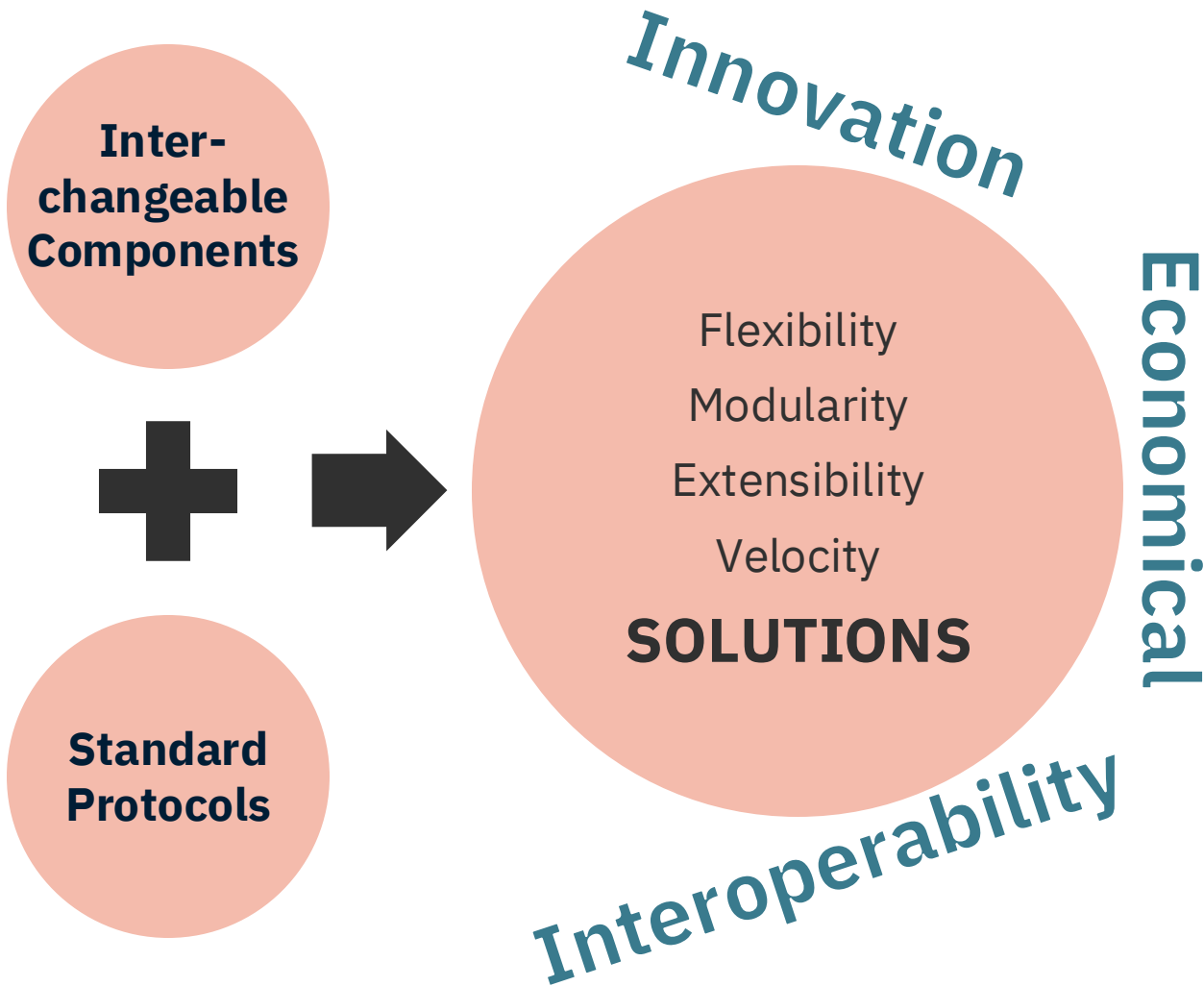
**Supply Chain Disruption**

To allow for **constellation communication** and **data offload to terrestrial systems,** we must have **high-bandwidth communications**

**Communi-cations Bandwidth**

Systems must have the capability for **secure** onboard **processing** and **data and communication** channels to prevent **disruption** from **Cyber** events

**Cyber Resilience**

## OPEN ARCHITECTURES PAVE THE WAY OF THE FUTURE

# Why Open Architectures



**Inter-changeable Components**

**+**

**Standard Protocols**

→

Flexibility
Modularity
Extensibility
Velocity
**SOLUTIONS**

*Innovation*

*Economical*

*Interoperability*

"A science-based, geographic approach can help us understand these interconnected problems holistically by integrating all kinds of information."
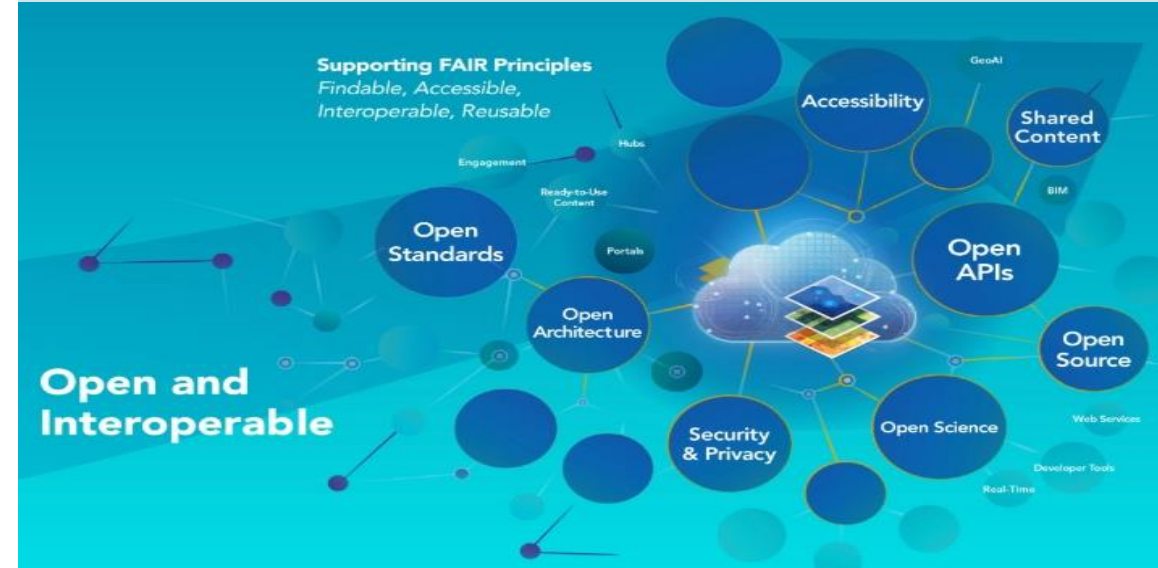


**Open Systems Architecture in Practice**
- Computing
- Networking
- Telecommunications
- Aviation

**Environmental Systems Research Institute, Inc. (ESRI)** Geographical Information Systems (GIS)

**OPEN ARCHITECTURE HAS FAR REACHING IMPACTS**

# Open Architectures in Computing "PLUG n PLAY"

Computing systems leveraging OPEN standards
for years:
- PCIe, USB, etc.
- JEDEC, IPC
- Ethernet (e.g., OSI)
- Open Source Software
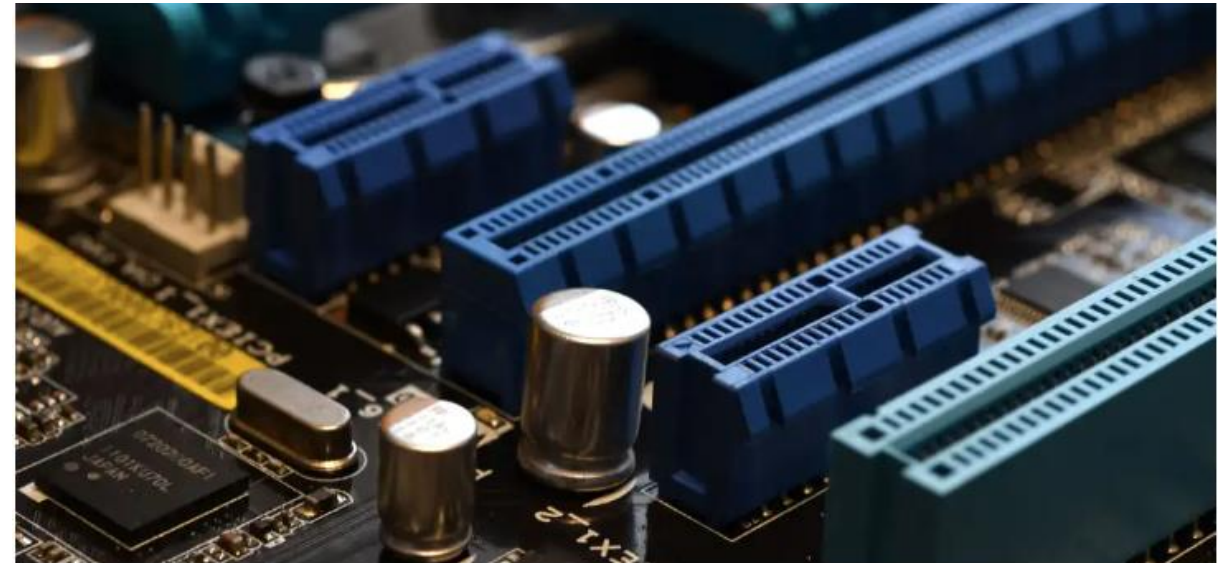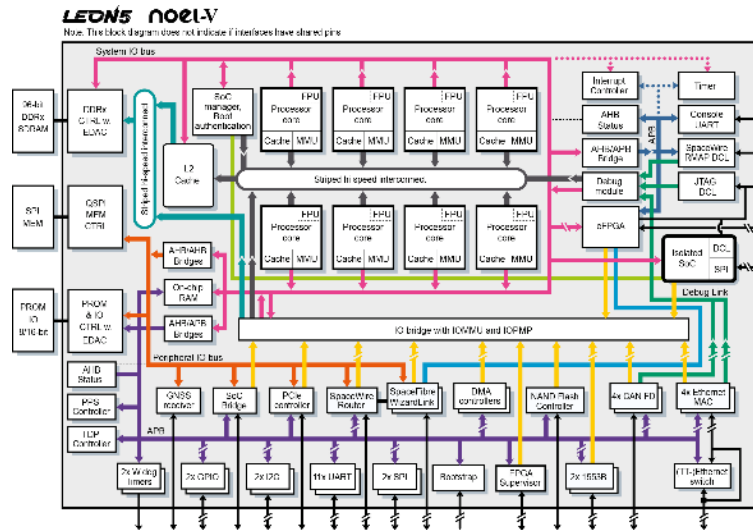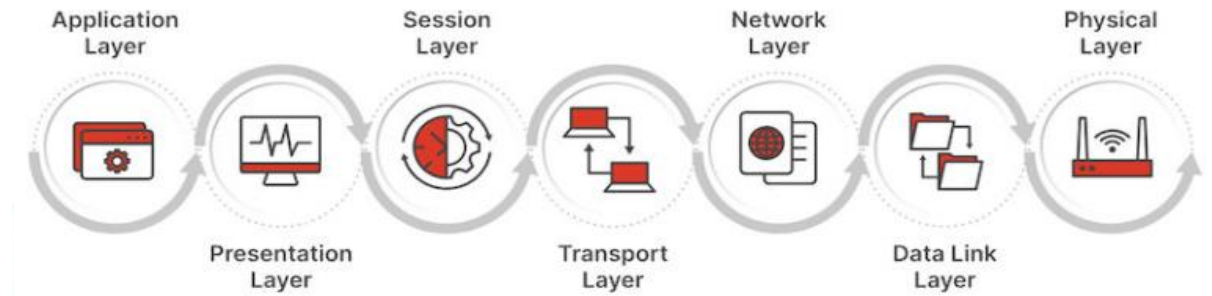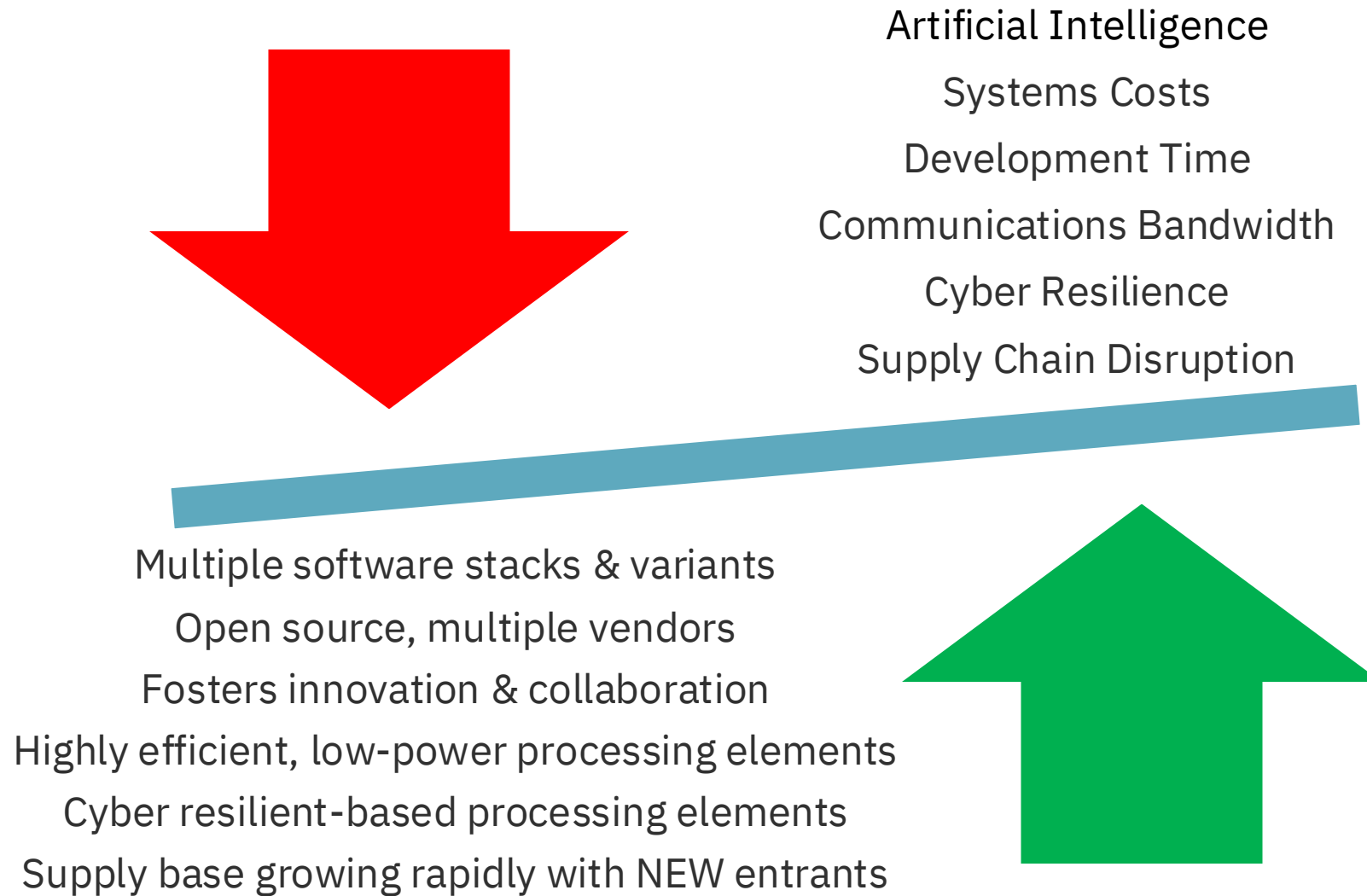- Open Source Hardware



Image: Dan74 / Shutterstock.com

**OPEN ARCHITECTURE ACCELERATING INNOVATION**

# RISC-V to the Rescue

Artificial Intelligence

Systems Costs

Development Time

Communications Bandwidth

Cyber Resilience

Supply Chain Disruption

Multiple software stacks & variants

Open source, multiple vendors

Fosters innovation & collaboration

Highly efficient, low-power processing elements

Cyber resilient-based processing elements

Supply base growing rapidly with NEW entrants

**RISC-V'S OPEN APPROACH LEVELS THE PLAYING FIELD FOR PROCESSING**

# FRONTGRADE

A GRADE ABOVE

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