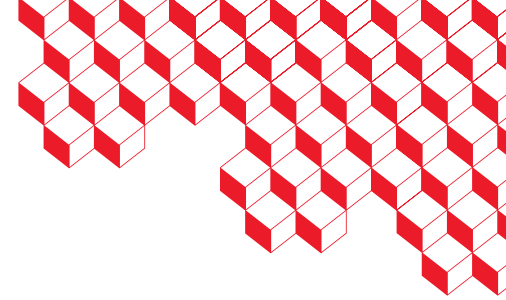




irfu

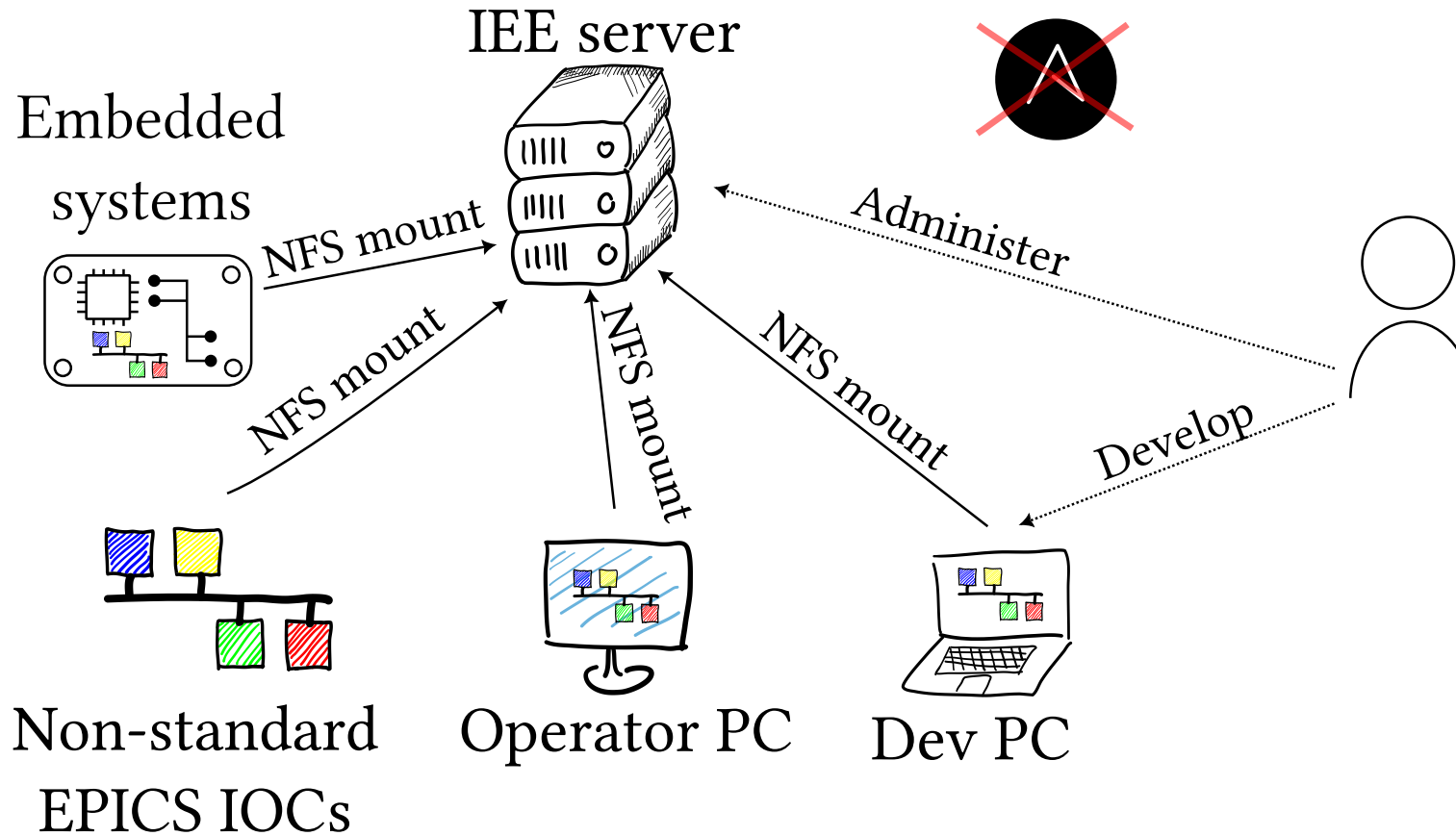


CEA deployment architectures

Packaging and deployment workshop

Rémi Nicole

2026-04-24

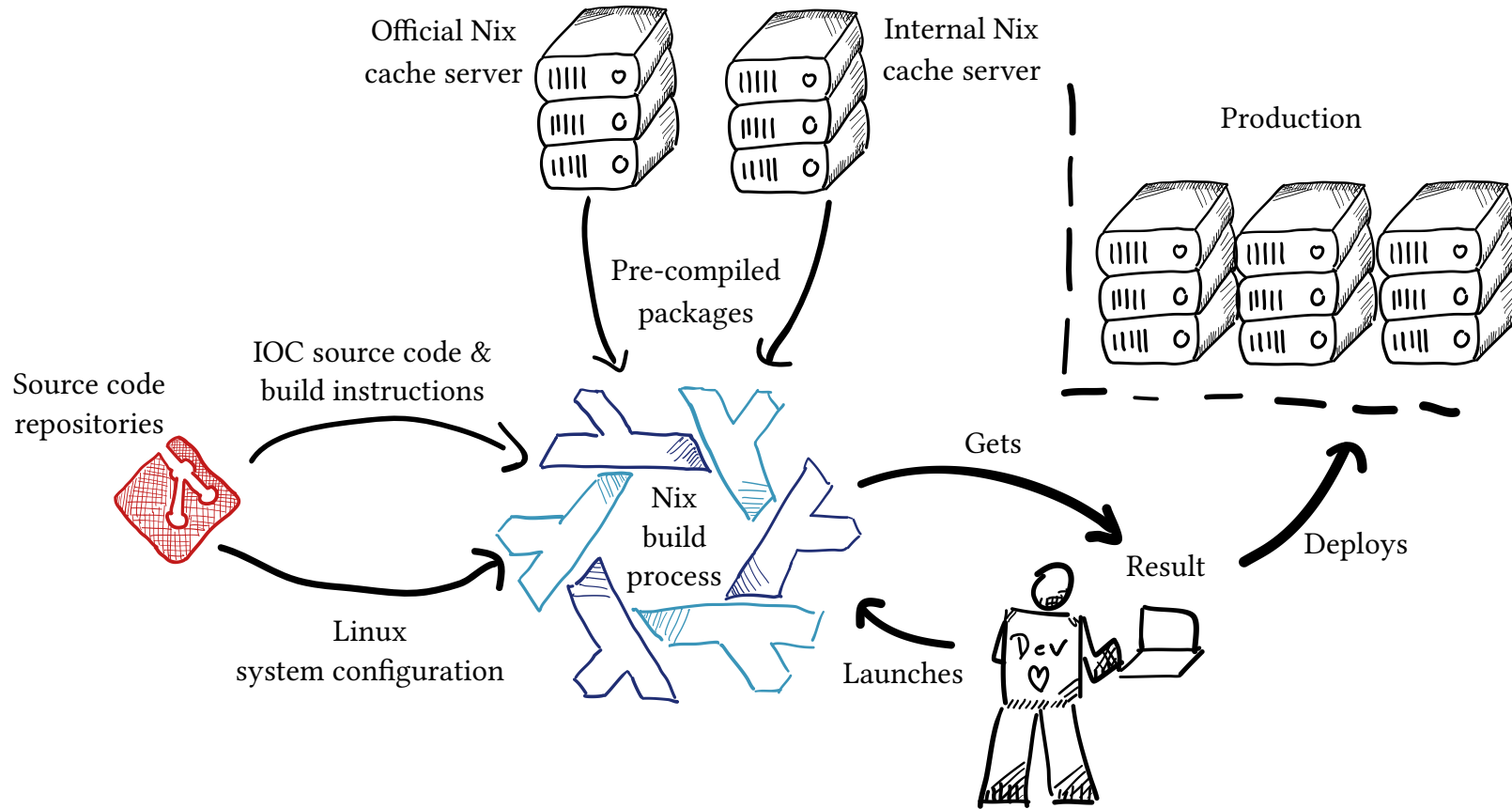




Typical SARAF deployment

- GitLab CI generates a Zip with the whole EPICS environment
- Zip gets burned into a CD/DVD
- On production, Zip gets deployed to the singular IEE server

Typical EPNix deployment



TITAN infrastructure

- Proxmox Virtual Environment
 - 3 nodes for production
 - 6 nodes for the test bench
- Proxmox Backup Server
 - 1 node in production and 1 node in the test bench
 - Also used for manual Archiver Appliance data backup (*rsync*)
- A monitoring machine
- Everything in a VM where possible
- NetBox for infrastructure “documentation”
- Single documentation entrypoint on GitLab

Solutions evaluated (TITAN)

- ✗ LXC containers in Proxmox
- ✓ Virtual Machines in Proxmox
- ✗ Routers
- ✗ Redundant network switch topology
- ✓ Managed switches with VLANs
- ✗ Monitoring in a Proxmox VM
- ✓ Monitoring in a separate machine
- ✗ Highly available Proxmox (*Ceph*)
- ✓ Proxmox ZFS replication
- ✗ NFS
- ✓ Everything installed locally (when possible)
- ✓ Everything in RAM for IOxOS MTCA boards
- ~ SSH certificates for server authentication
- ~ CEA's ActiveDirectory for operator authentication

EPNix/E3 Diss

- ~ ✗ Reproducible
- ✓ ✓ Declarative
- ✓ ✓ Works for basically any language/framework
- ~ ✗ Complete dependencies
- ~ ✗ Locked dependencies
- ? ✗ Traceable dependencies
- ✓ ~ Provides development shell
- ✓ ✓ Declarative configurations
- ? Integration tests
- ? Interactive tests
- ✓ ✗ Offline deployments
- ✓ ~ Vendor-agnostic continuous integration
- ✗ ISO image building
- ~ VM building
- ✓ ? Docker container building
- ✗ Appliance-style image building
- ? ✗ Works for embedded systems
- ✓ ~ Configuration rollbacks
- ✓ ~ Atomic upgrades
- ✓ Multi-machine declaration
- ✓ ~ Cache server
- ✓ ✗ Archive dependencies
- ? ✗ Archive build dependencies
- ? ~ Build isolation
- ✓ ~ Install multiple concurrent versions
- ✓ ✓ Infrastructure as code
- ✓ ✓ Single configuration repository
- ? ✗ SBOM generation
- ? ~ Immutable package store
- ✗ Specialization support
- ? Configuration checking before application
- ✗ Sub-container declaration
- ✓ ✗ Per-user package installation
- ✗ Declarative disk partitioning
- ✓ ✗ No dependency on the host Linux distribution
- ? ✗ Parallel builds
- ✗ Configure **everything**