Building Large-Scale Distributed Computer Vision Solutions Without Starting From Scratch

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Network Optix

NetworkOptix
VIDEO. POWERED.

About Us

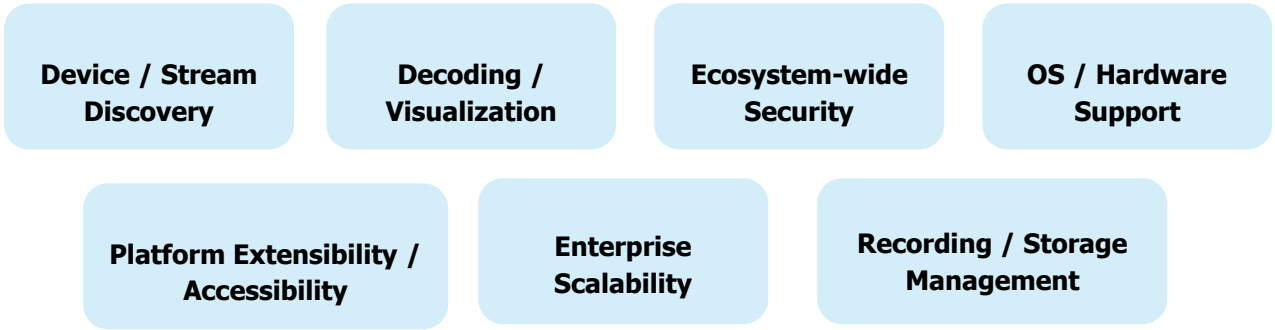
Quick Company Facts

- Founded in 2010 with the goal of creating a platform approach to enterprise video management.
- Headquartered in the Silicon Valley.
- Offices in Los Angeles, Portland, Texas, Colorado, London, Taipei, Adelaide, Kiev, and Bogota.
- 150+ FTE's - 90% technical

Awards & Recognition

- On the Inc 5000 Fastest Growing Companies list for **7 years running.**
- Recently voted the #1 VMS in the world, beating out rivals by 25% in favorability.
- 3 million IP cameras under management (that we know about!)

7 Big Challenges
When Creating Intelligent Video Products



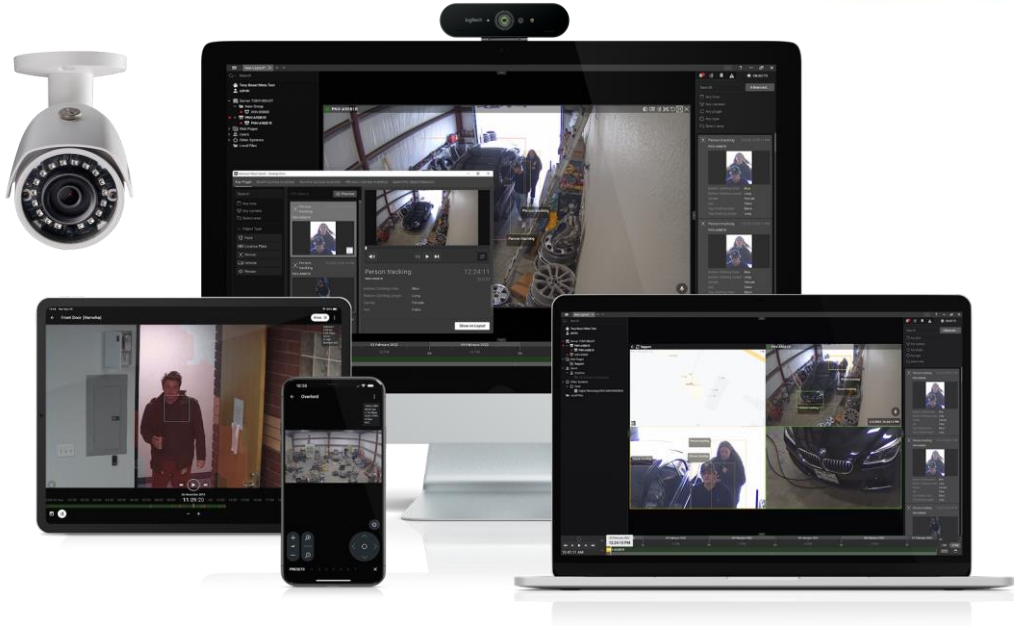
Bottom Line: Creating an intelligent video application is HARD.

Nx came up with our Platform approach to make it easier.

Nx Platform

Powered By nx

APIs | SDKs



A full-stack (cloud, server, desktop, mobile) **intelligent video platform for creating enterprise-scale SaaS.**

Nx Cloud

Public (or Private) Application

A public or private cloud application that allows customers to scale their VaaS business to any size and on any cloud provider.
(Private Cloud - 4Q23)

- Connect and manage unlimited number of systems
- Manage and monitor system health and device
- Control customer access to systems with custom roles
- Easily integrate with any existing cloud infrastructure
- Universal S3 Cloud Storage plugin (4Q23)

Nx Server

Cross-Platform Media Server

A lightweight, cross platform media server software agent with unique capabilities that manages system connections, data, access, and automations.

- Server hive architecture (automatic failover / redundancy)
- No prerequisite software (database included)
  Extremely lightweight (can even run on camera)
- Auto-discovers tens of thousands of video devices from 700+ manufacturers (and growing constantly)

Nx Desktop Apps

Open Source Cross-Platform Thick Clients

A super responsive, easy to use, lightweight desktop client that allows for customized management and monitoring of all system resources.

- Lightning fast video playback and search w/o need for GPUs
- Combine images, videos, web pages, I/O devices to increase situational awareness
- Runs on Windows, Mac, Linux (Ubuntu)
- No prerequisite software required

Nx Mobile

iOS & Android Apps

A mobile app for getting alerts and being able to view and control devices in response.

- Source code to be opened in 2023.
- Custom built media player = low latency.
- Soft triggers allow remote control of peripheral devices.
- View live / search video / playback based on push notifications.
- Fisheye dewarping / PTZ control / live thumbnails etc.

Nx Dev Tools

Free Open SDKs and APIs

Built right into the product, Nx Developer Tools make it easy for developers to integrate Powered by Nx products with any 3rd party hardware / software to capture / generate video-associated metadata.

- Server API
- Cloud API
- Metadata SDK (and visualization engine for information overlay)
- Storage SDK
- Video source SDK

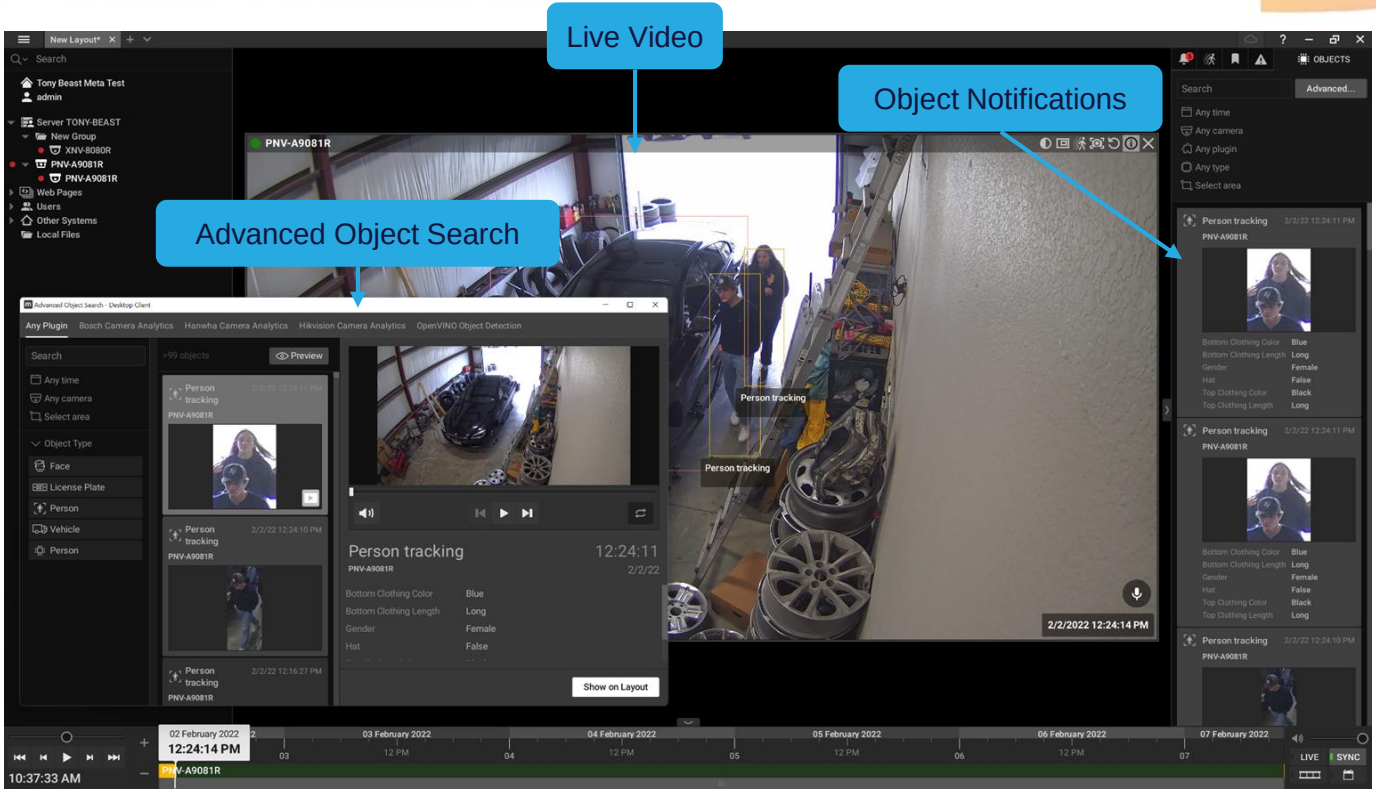
Works with Nx Ecosystem

Integrations Ecosystem

An expanding ecosystem of already integrated 3rd party applications

Helps companies quickly discover and promote value-added, complementary products (analytics, access control, monitoring tools) that integrated and work with the Nx Platform.

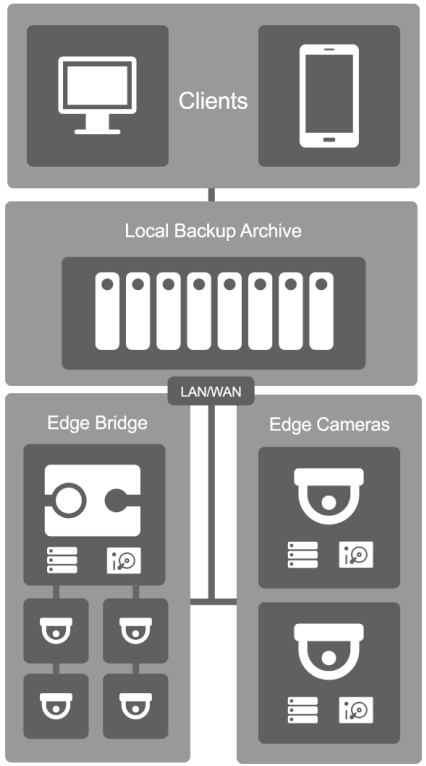
Client Components



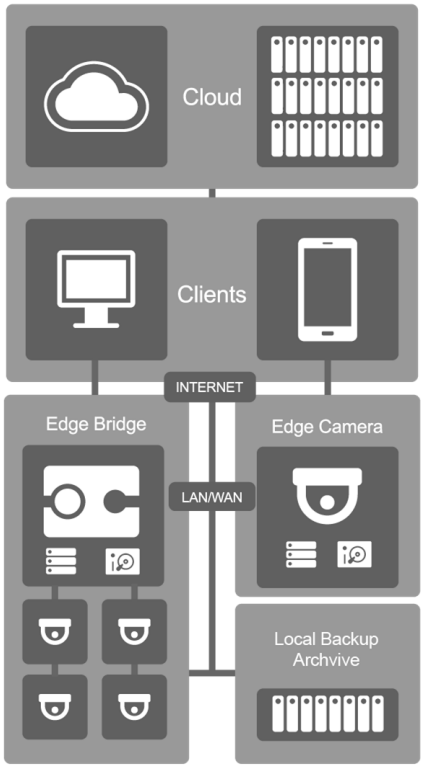
Nx At the Edge

On-Prem • Hybrid • Straight to Cloud

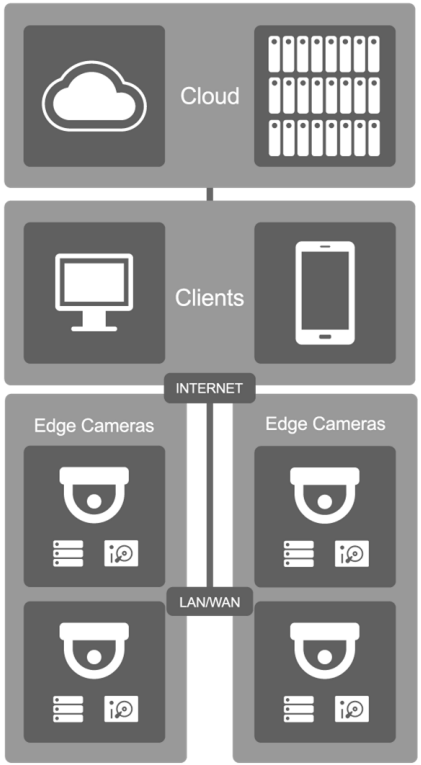
Deployment Modes



On Prem / Private



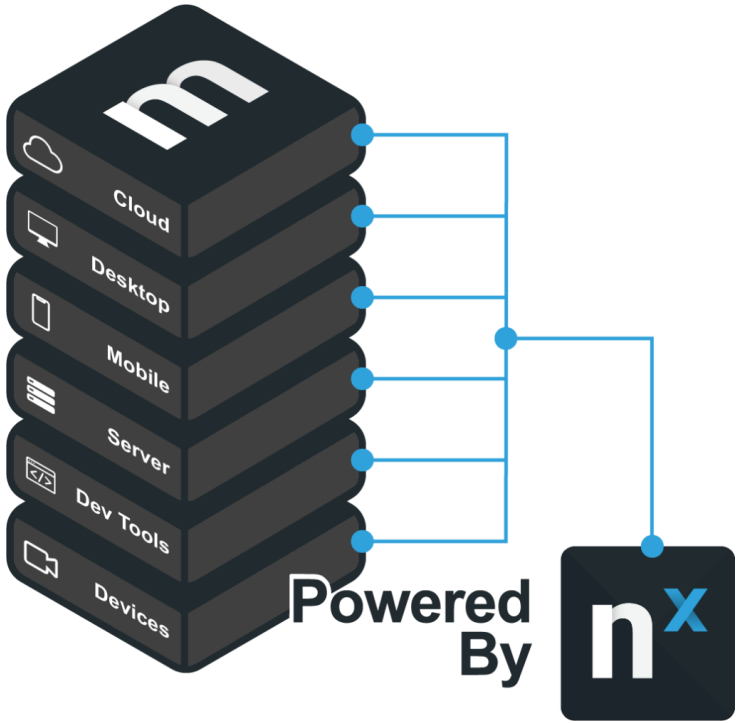
Hybrid



Edge to Cloud

Edge Applications Are Enabled By the Nx Server

- The Nx Server application is a lightweight application **designed to run on both high and low-power computing hardware**.
  - Intel Xeon platforms
  - ARM SoCs
  - *Same exact feature set*
- **Prerequisite** to install Nx Server on an edge device very small - compute, storage, RAM.
- **Existing installation packages for development boards** - including **Raspberry Pi** and **NVIDIA Jetson** hardware.



Nx for Edge Devices

Bridge Devices / Micro Servers & All-in-One Cameras

Gateway Devices

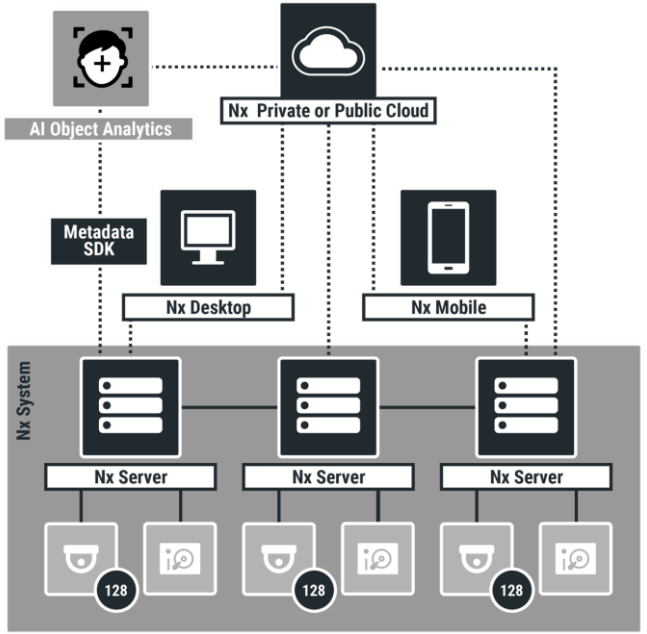
- Small, low-power ARM-based Servers
- Limited storage capabilities
  - 1 x HDD (2.5” or 3.5”)
  - NVMe, mSATA, m.2
  - Store video for days / weeks
  - Local recording w/ remote access + NAS / cloud backup capabilities
- AI accelerated

Edge-to-Cloud IP Cameras

- IP Cameras w/ a modern ARM chipset
- Designed to run applications natively
- Limited storage capabilities
  - Typically SD card
  - Store video for hours / days
  - Local recording w/ remote access + NAS / cloud backup capabilities

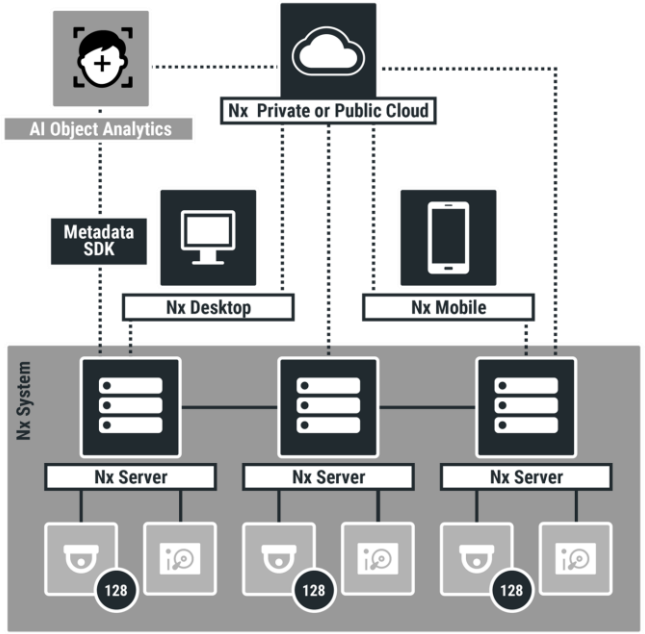
V5.1 Containerization

- **Architecture**
  - Client / server hive / cloud architecture
  - Servers form a hive and synchronize system data
  - Clients can connect to any server to view entire system.
  - Plugins allow object-based analytics to integrate seamlessly with Powered by Nx products.
- **Containerized Nx Cloud**
  - Makes deployment to **private cloud** and ecosystem partner platforms (like NVIDIA NGC) possible.



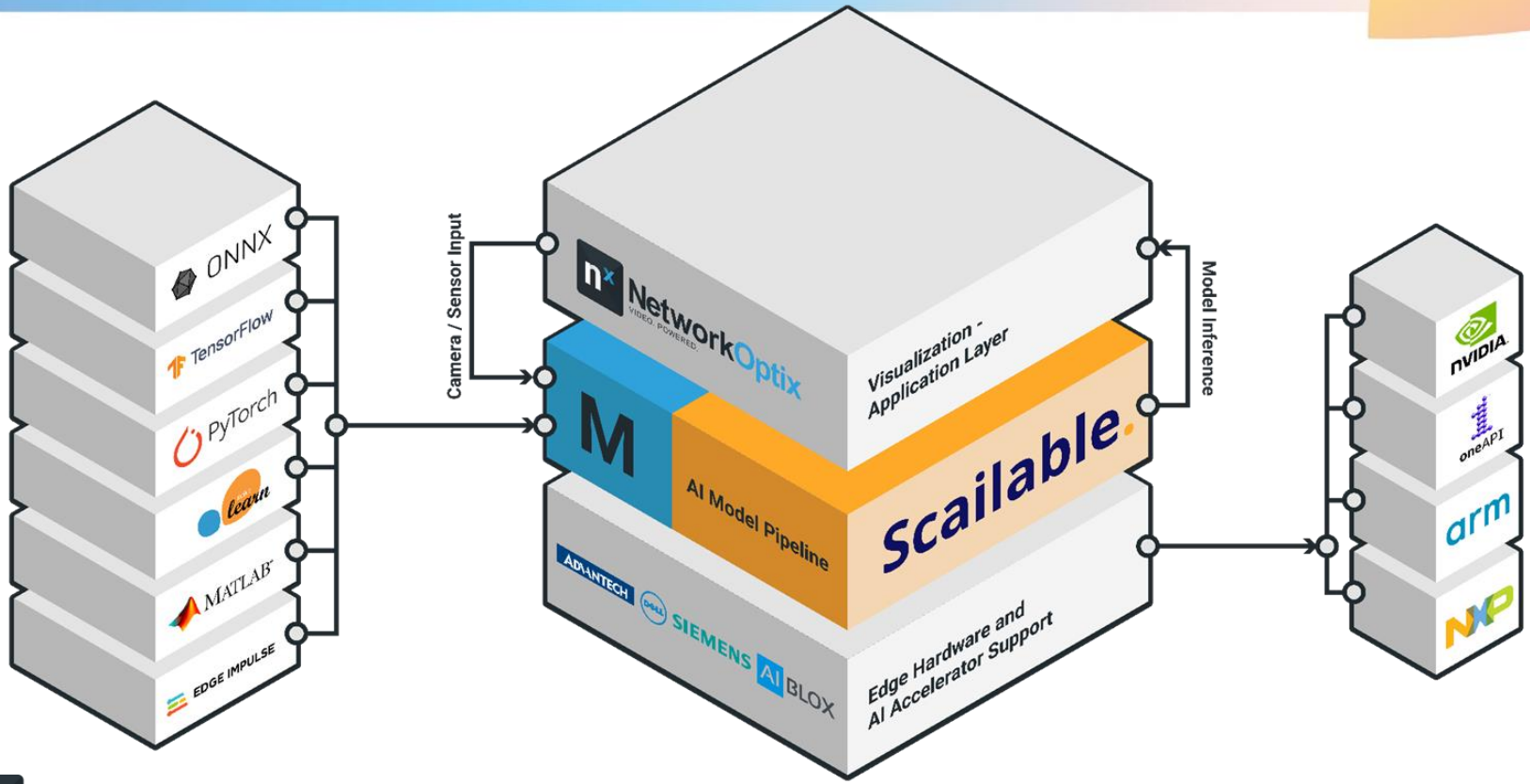
V5.1 Containerization

- **Remote Management**
  - Clients can connect their system to Nx Cloud for simple remote connectivity and management.
  - Health monitoring and remote log retrieval.
  - Cross-system cloud layouts.
- **Scalability**
  - **Cross-system interactions introduced** to allow operators to combine resources in Nx Cloud to create "infinitely scalable" systems.
- **Redundancy**
  - No single point of failure
  - Automatic camera failover
  - Automatic backup of system databases during merge / upgrade
  - Health monitoring



Case Study: Scailable
What can you build with the Nx Platform?

Integrating Any AI Computer Vision Use Case



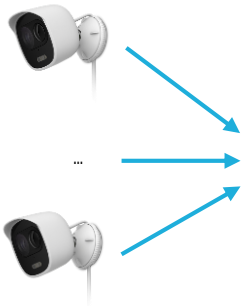
Nx - Scailable Edge AI integration

edge

Nx Server
Cross platform media server

+ Scailable AI Manager

Installed on the edge device, allows for secure and modular deployment of AI models.
Simply configure the input and output and run your AI pipeline.



Connect sensors (cams, vibration sensors, etc.) to an edge device.

* Local AI model execution using a patented device agnostic deployment mechanism.

cloud

The Scailable AI Model Platform allows for effortless remote AI Model deployment.
Unique model compression method optimized for portability.

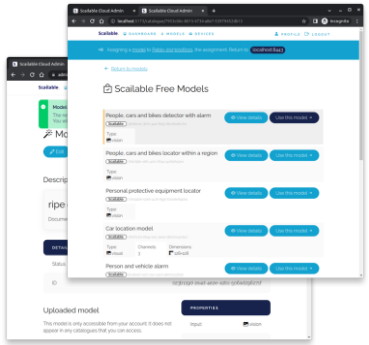
Deploy AI model

Visualization

Nx Cloud
public cloud application

Nx Desktop
cross platform thick client

Nx Mobile
iOS and Android app



Nx Platform in Summary

Feature Rich

- Full Nx Server capabilities
- Server hive architecture
- Automatic failover / redundancy
- Device health monitoring (even locally)
- Automatic discovery of other servers
- Merge locally or via cloud

ARM Friendly

- Lightweight and CPU-driven - leaves GPUs for analytics.
- Installation packages for leading developer boards like NVIDIA Jetson and Raspberry Pi
- Can be adapted to run on virtually any modern ARM chipset.

Flexible Architectures

- Combine Nx edge capabilities with cloud to build the most redundant, snappy SaaS solution out there.

Open for Development

- Same great Powered by Nx developer tools.
  - Server API
  - Metadata SDK
  - Licensing, accounting and DRM

How Do I Develop My Own Embedded Solution with Nx?

- Download installation package
- Test with your device
- Reach out if you run into any issues
- Documentation at https://support.networkoptix.com

SCAN HERE TO VISIT OUR GITHUB PAGE

- Integrate your AI with our Metadata SDK
- Integrate your logic and data visualization with with the Cloud APIs
- Customize your own client using our open source