A Platform Approach to Developing Networked Visual AI Systems

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Network Optix, Inc.

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VP of Product Marketing
Network Optix, Inc.

About Network Optix

Quick Company Facts

- Founded in 2010 with the goal of creating a platform approach to enterprise video management.
- Headquartered near Los Angeles, California.

Quick Company Facts

- On the Inc 5000 6 years running.
- 3 million IP cameras under management (that we know about!)

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What We're Here To Talk About

We live in a new information age primarily driven by video.

- Internet video traffic will be 82% of all consumer Internet traffic by 2022.

  - Cisco
    VNI Complete Forecast Highlights, 2018

Metadata-enabled video is a driving force behind the change.

- Global video analytics market - $6.35 billion in 2022 to $28.37 billion in 2029, exhibiting a CAGR of 23.8%

  - Fortune Business Insights
    Video Analytics Market, 2022-2029

Our Thesis:
Metadata-enabled video will become an integral part of all software / systems because of the volume and scope of information it generates.

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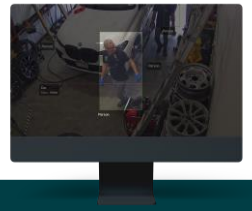
10 Big Challenges
of Creating Intelligent Video Software as a Service (VSaaS) Solutions

Device / Stream Discovery



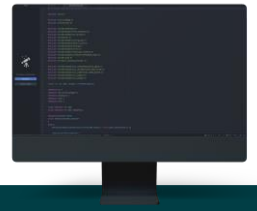
Video / Metadata Capture

Storage Management

Decoding / Visualization

OS / Hardware Support

System Scalability



Product Extensibility

Usability / User Experience

Local & Remote Connectivity

Cyber Security

Conclusion:

Creating an intelligent video application is complicated.
Nx Meta and our **VPaaS** approach to make it easier.

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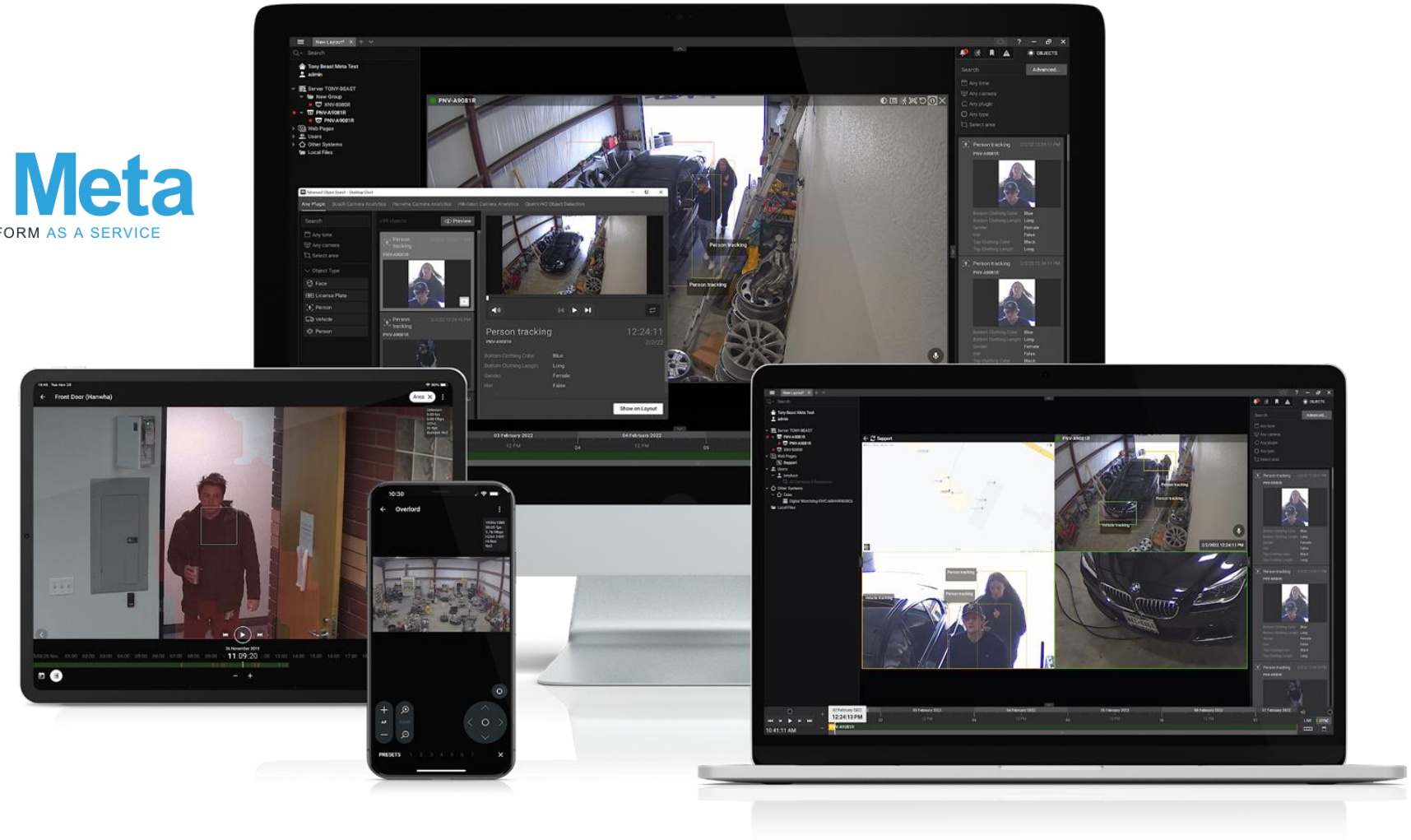
Our Solution to These Challenges
VPaaS

Nx Meta
VIDEO PLATFORM AS A SERVICE



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What is Nx Meta?

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What is Nx Meta?

It's like Wordpress – but instead of building websites, we're building intelligent video products.

Nx Meta is a full-stack video platform –
with Cloud, Server, Desktop, and Mobile applications –
designed to help companies rapidly develop full-featured,
AI-enabled edge-ready video products.

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Major Advantages of a Platform Approach to Video

Nx Meta has unique capabilities.

- *Automatically discovers and manages 99% of IP cameras and webcams* on the market today.
- Industry-leading UX / UI design for desktop and mobile applications.
- Unique server-hive architecture makes systems redundant, reliable, and easy to scale.
- Cloud capabilities make it simple to remotely connect to and manage systems of unlimited size and scale.

Which means you can:

- *Focus on adding capabilities that make a difference* for your market and customers.
- *Reduce development and engineering costs* while adding enterprise intelligent video capabilities to your products.
- *Develop a competitive advantage over entrenched industry names* in a matter of months.
- Capitalize on the opportunity metadata-enabled video is bringing to the table without having to sacrifice continued development of existing products.

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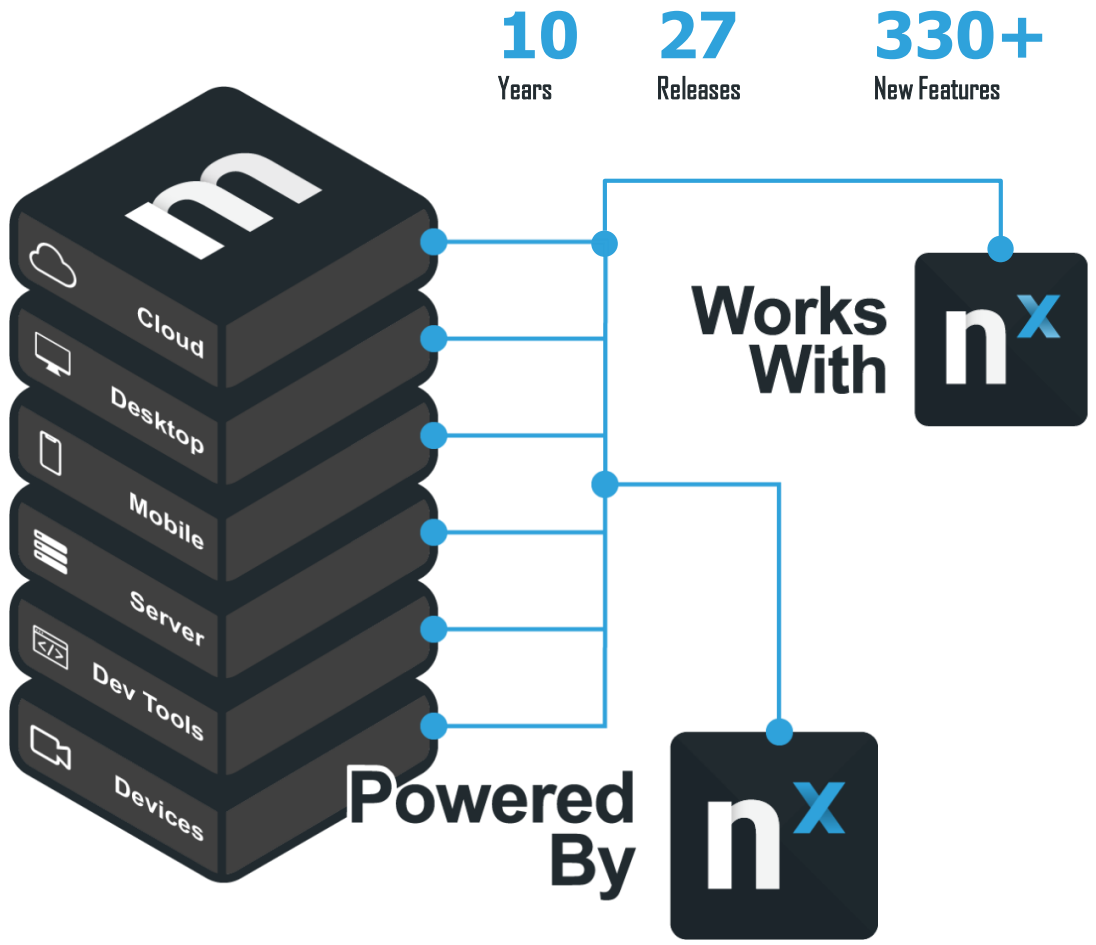
What Nx Meta Is and What it Does

- Nx Meta is a video platform with cloud, desktop, mobile, and server applications with open development tools (API, SDKs).
- Nx Meta solves most of the challenges of creating and launching an intelligent video product - simple or complex.
- Nx Meta takes you 95% of the way to a finished video product out of the box.
- Nx Meta makes it easy to quickly add video to your business by allowing you to choose what hardware you use — and is easy to integrate with your existing hardware and software solutions.



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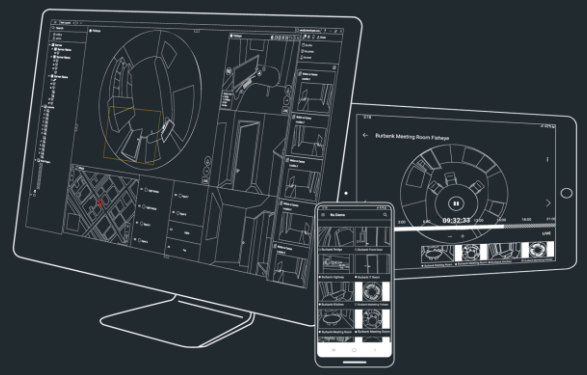
Nx Meta
Use Nx Meta to Create or Integrate

Platform

Powered By nx

Private labeled **VSaaS** solutions built for and with partners for a target market with a recurring revenue business model.



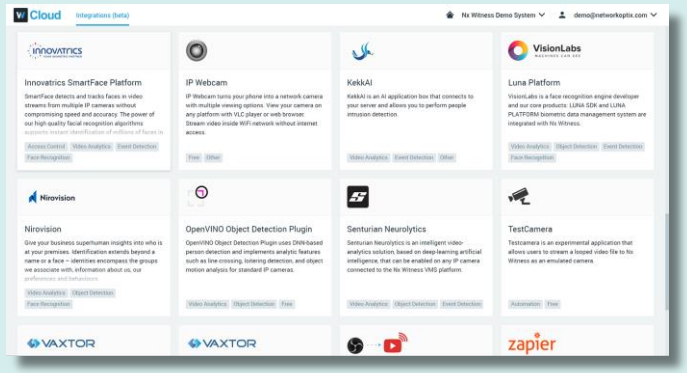
Nx Meta
VIDEO PLATFORM AS A SERVICE

APIs | SDKs

Ecosystem

Works With nx

An **Ecosystem** where partners, customers, and end users can discover and promote integrated complementary technologies.



Product

Nx Witness
VIDEO MANAGEMENT SYSTEM

A Powered by Nx **VMS** (Video Management System) sold via distributors and system integrators around the world.

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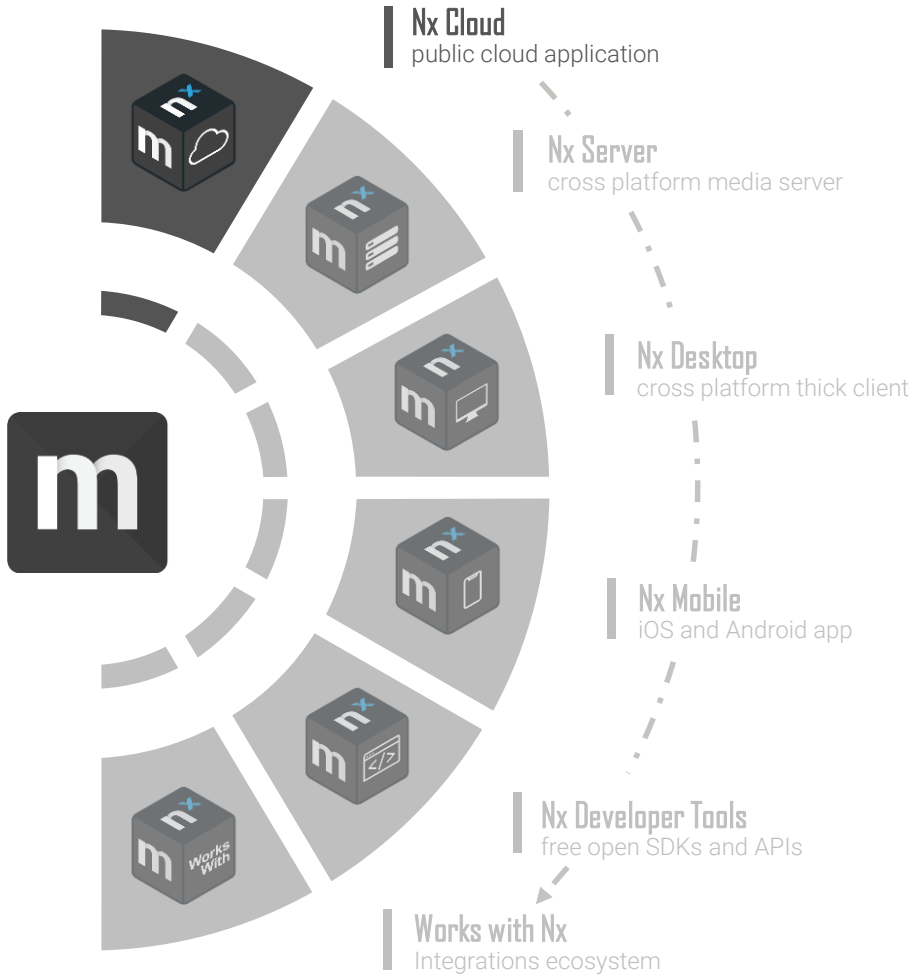
Nx Meta VPaaS Components



Nx Cloud

A cloud application that runs on Amazon that allows customers to scale their VSaaS business to any size.

- Connect and manage an unlimited number of Systems
  - A System can scale from 1-10,000 cameras out of the box.
- Manage and monitor system health and devices
- Control customer access to systems
- Easily integration to 3rd party with Cloud CRUD API
- Host in your own Private Cloud (coming soon)

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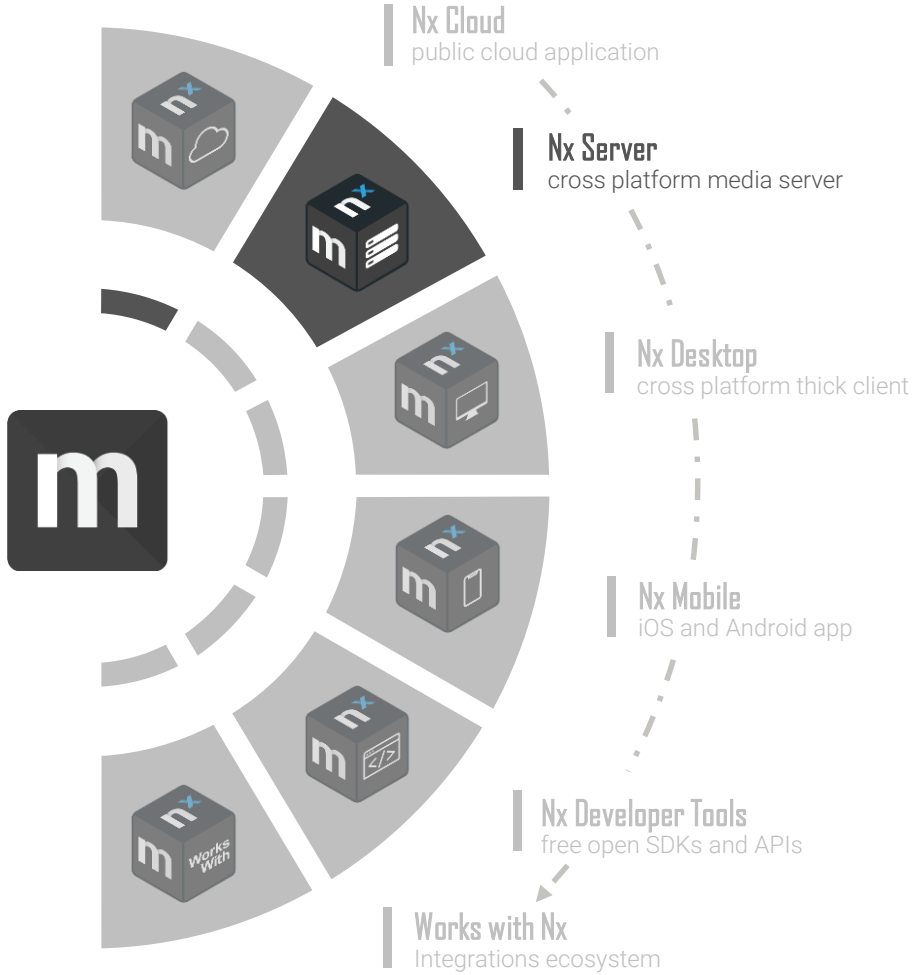
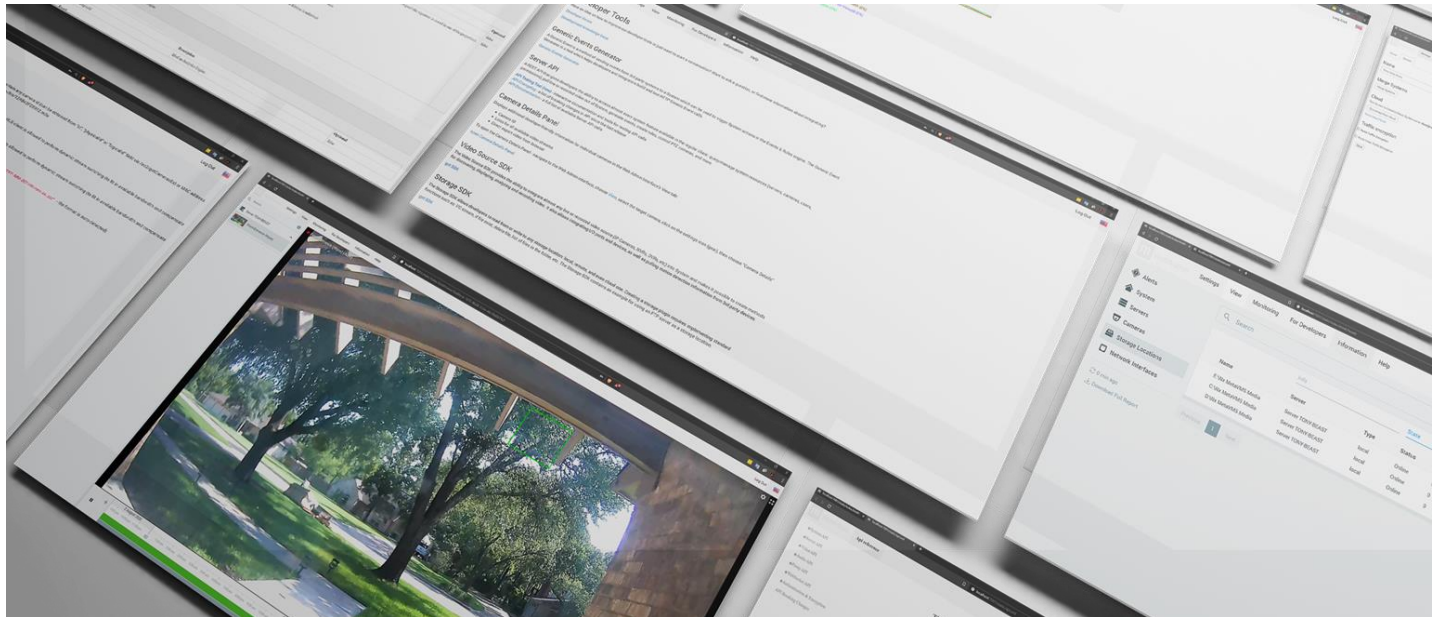
Nx Meta VPaaS Components



Nx Server

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

- Server **Hive Architecture** (Automatic Failover)
- **No prerequisite software** (database included)
- Extremely **lightweight** (can even run in cameras)
- Auto-discover **tens of thousands of video devices** from **700+ manufacturers**



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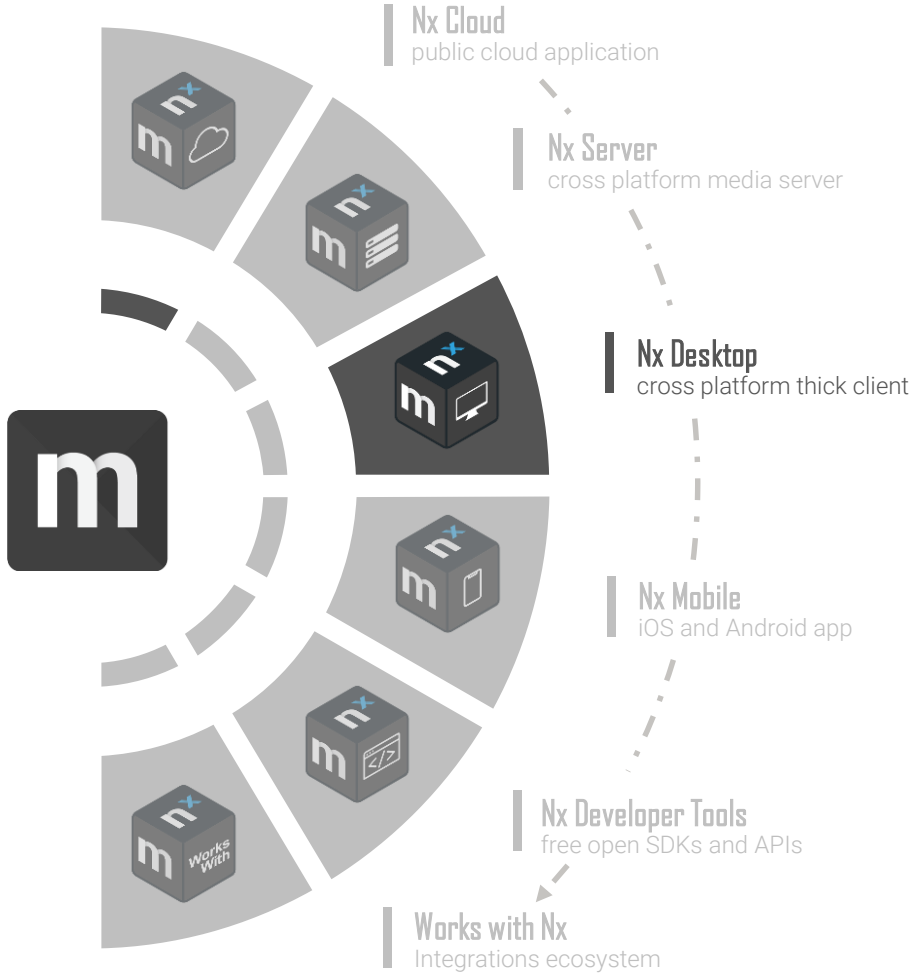
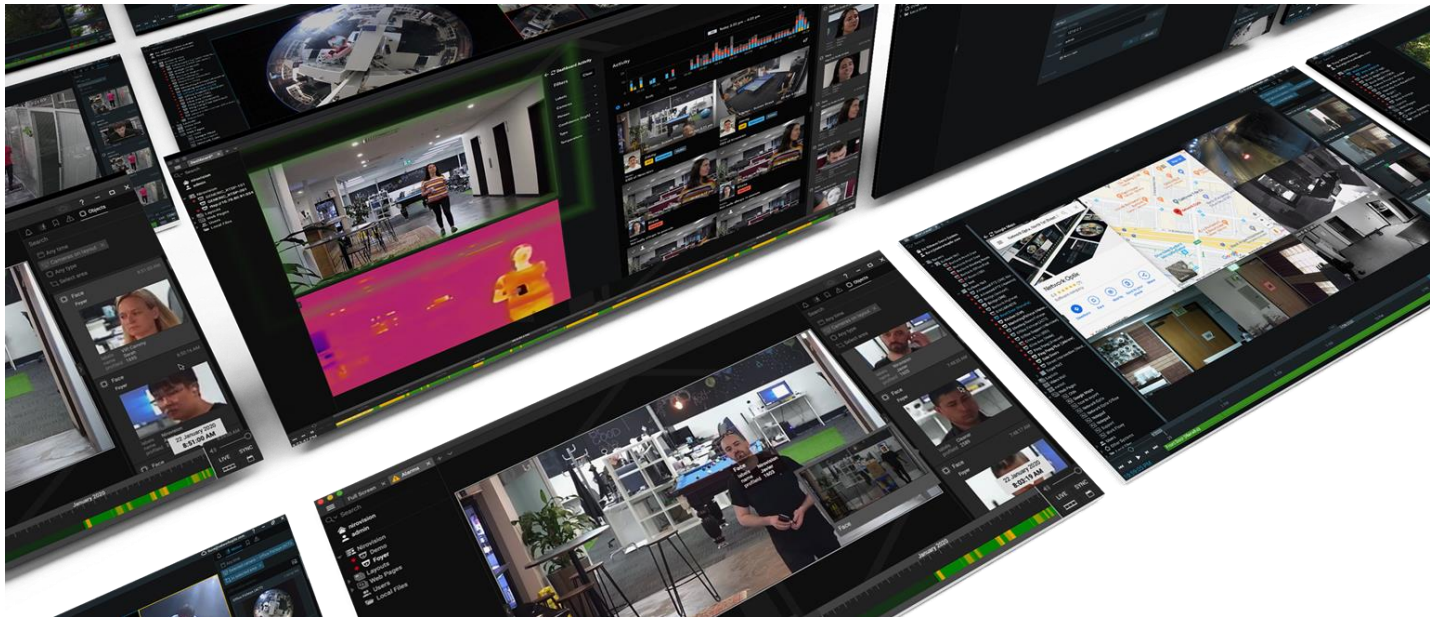
Nx Meta VPaaS Components



Nx Desktop

A super **responsive**, **easy to use**, built-**close-to-the-metal media browser** that allows for **customized management** and **monitoring** of 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, Apple, or Ubuntu Linux devices.
- **No prerequisite software** required



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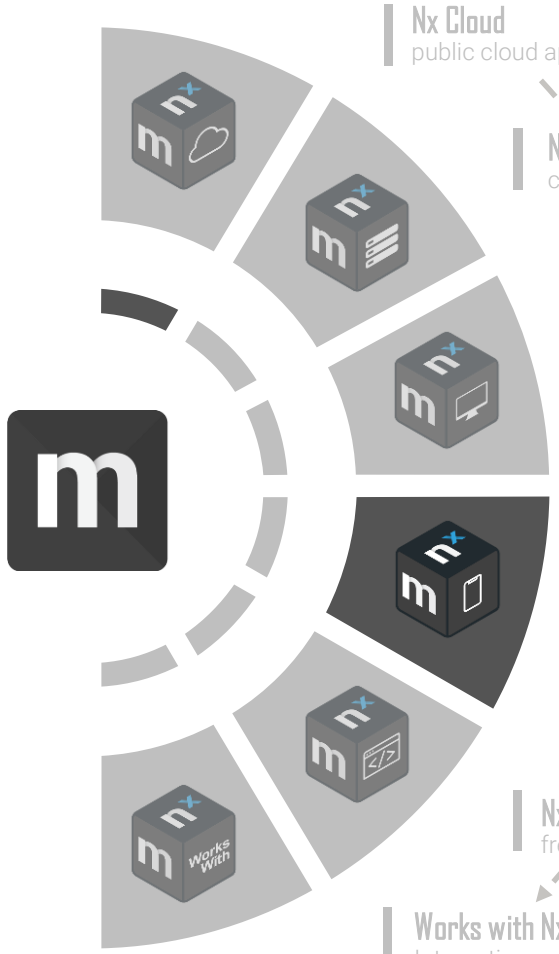
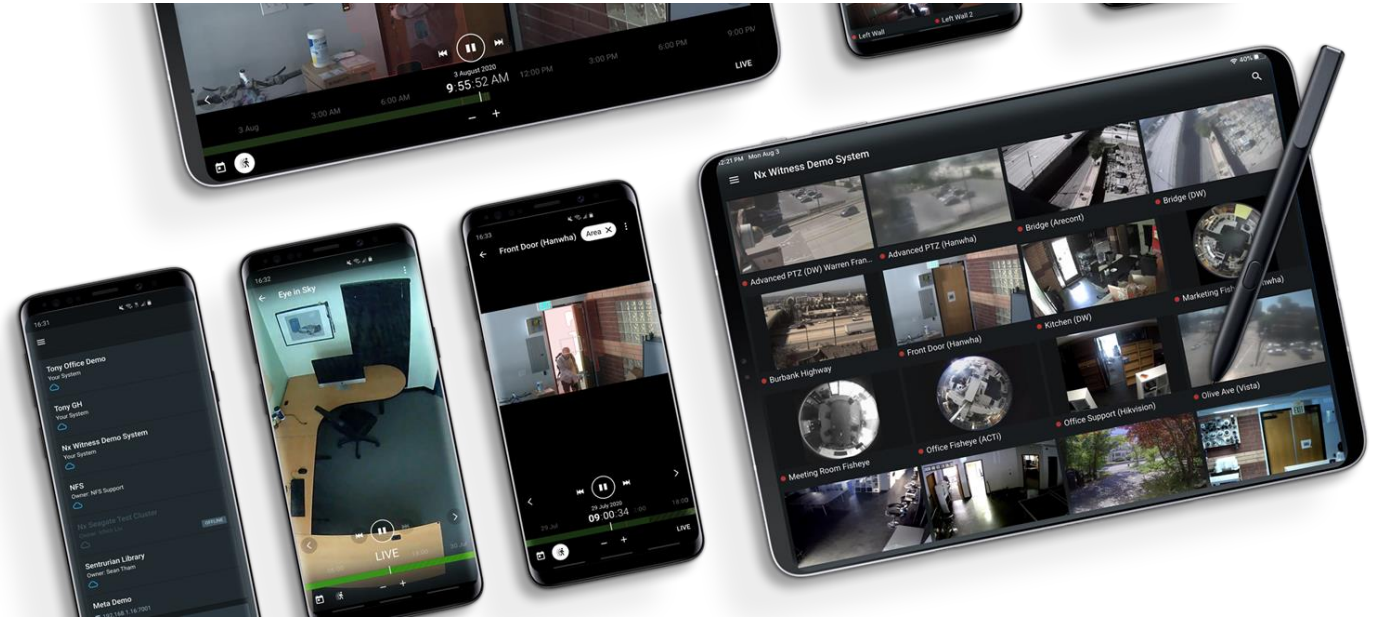
Nx Meta VPaaS Components



Nx Mobile

A mobile app built for iOS / Android devices with a focus on **getting alerts** and being able to **view / control devices in response**.

- 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.



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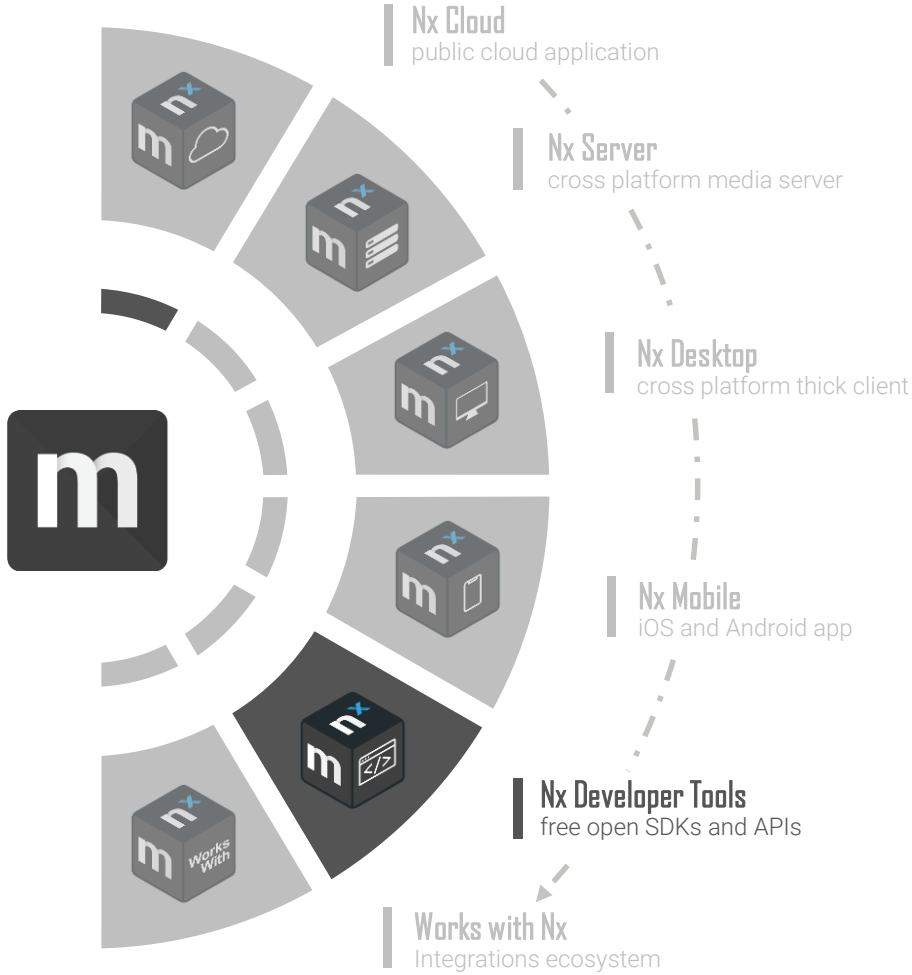
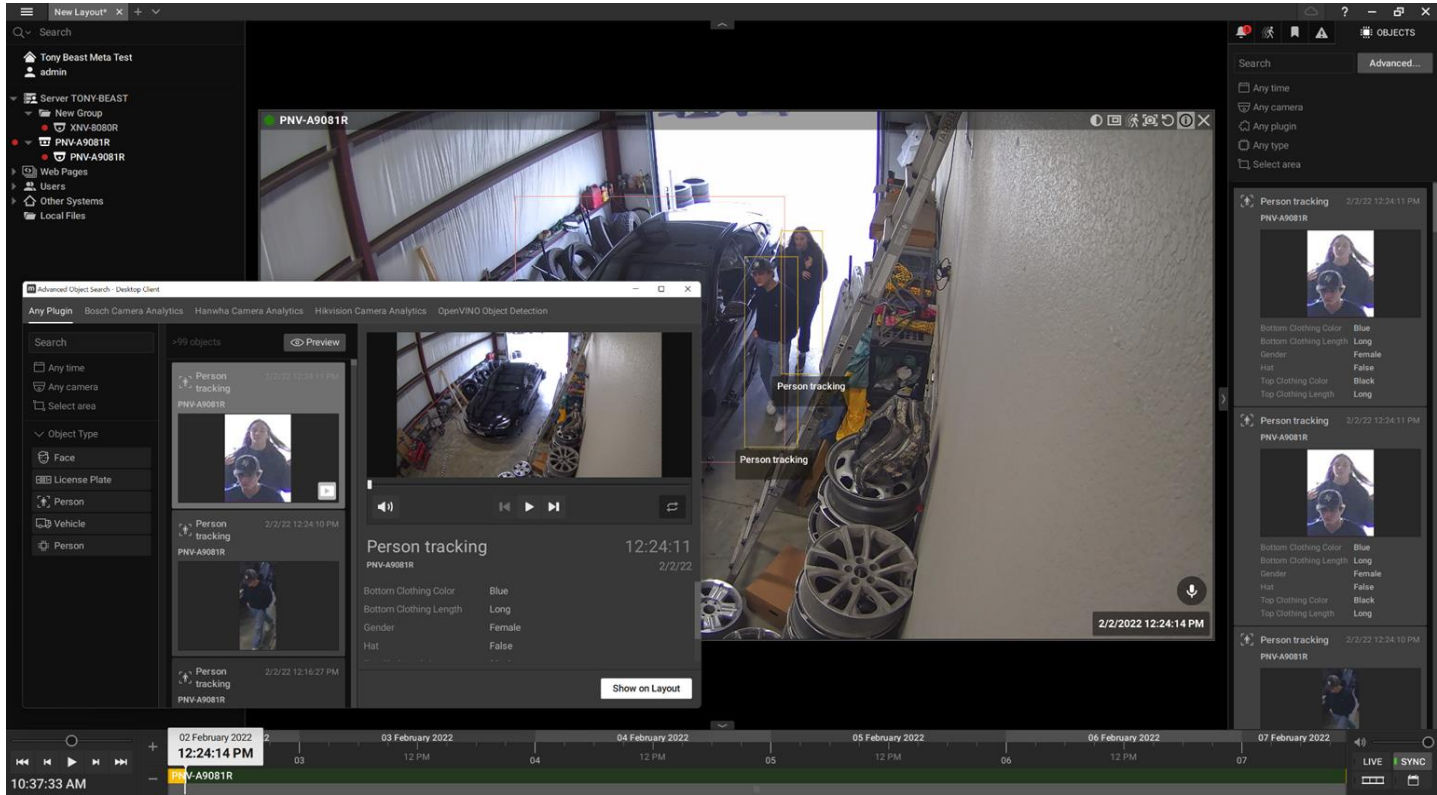
Nx Meta VPaaS Components



Nx Developer Tools (C++, HTTP and More)

- Built right into the product
- Integrate with any 3rd party solution to capture / generate video-associated metadata.
- C++ SDKs for integrating devices and 3rd party object analytics
- REST CRUD API for fast, painless integrations.



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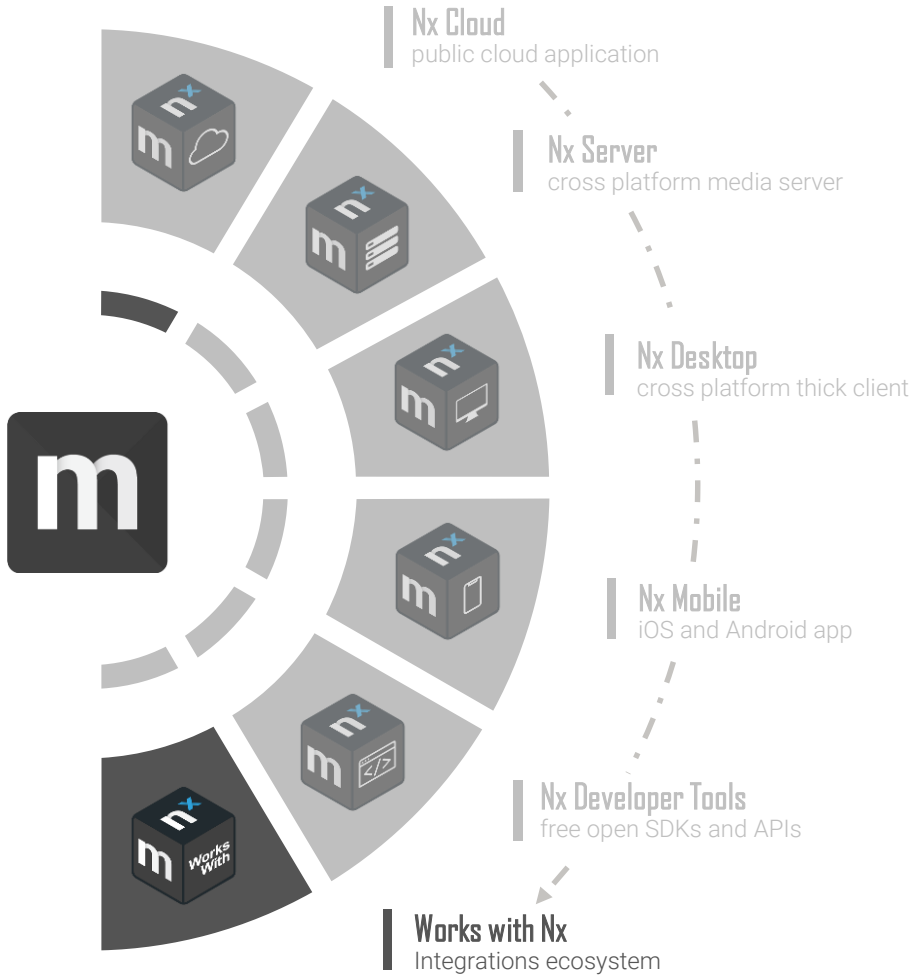
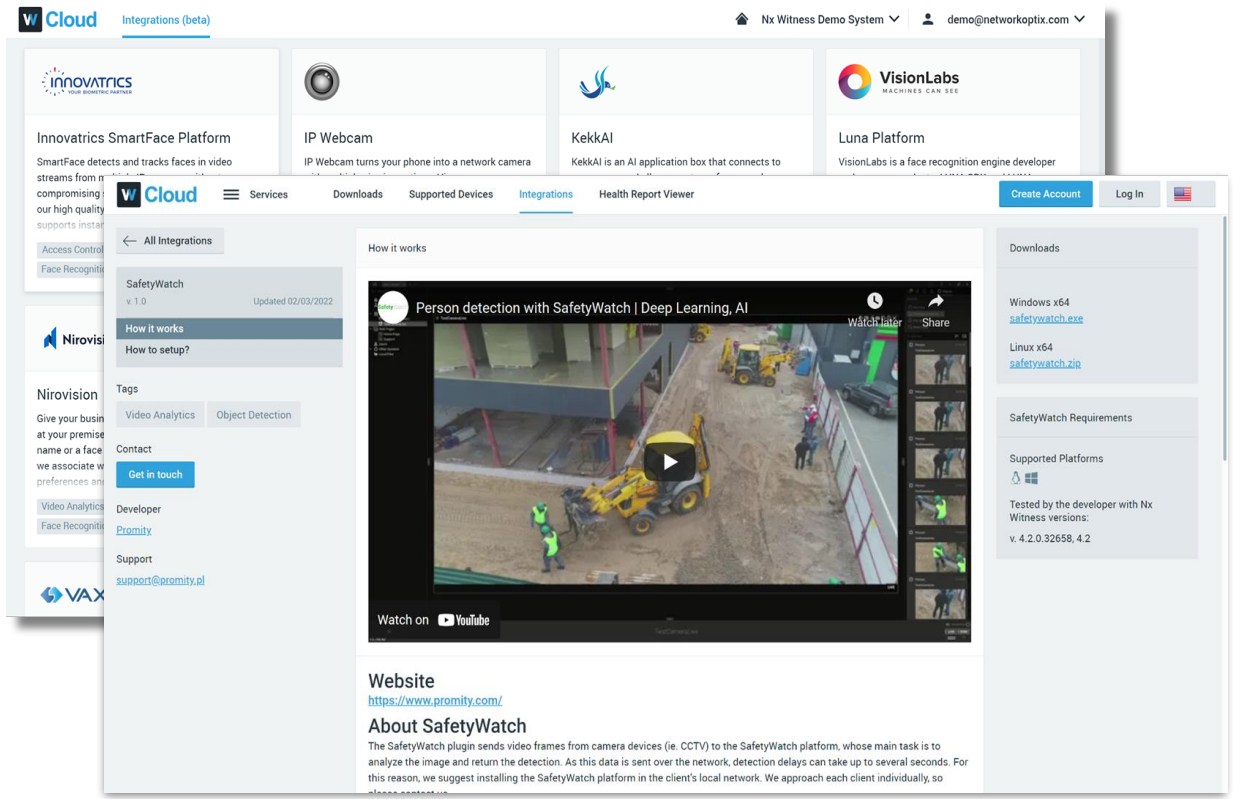
Nx Meta VPaaS Components



Works with Nx Ecosystem

- Dozens of integrations to video analytics and 3rd party systems
- Makes it easy to discover and add capabilities to any Powered by Nx product.



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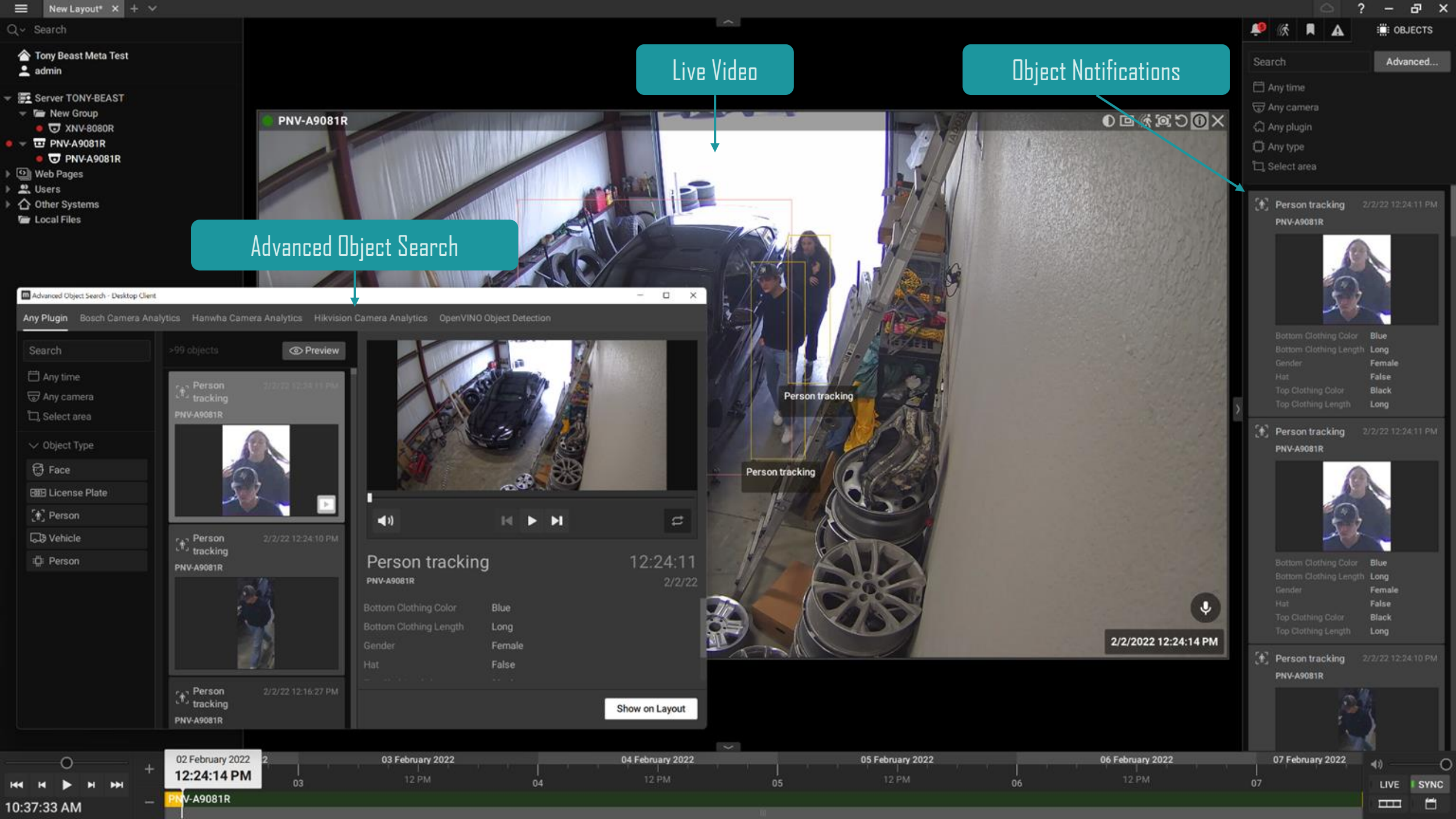
Live Video
Object Notifications
Advanced Object Search
New Layout*
Search
Tony Beast Meta Test
admin
Server TONY-BEAST
New Group
XNV-8080R
PNV-A9081R
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Local Files
PNV-A9081R
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Any camera
Any plugin
Any type
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Bottom Clothing Color Blue
Bottom Clothing Length Long
Gender Female
Hat False
Top Clothing Color Black
Top Clothing Length Long
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2/2/22 12:24:11 PM
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Bottom Clothing Color Blue
Bottom Clothing Length Long
Gender Female
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Advanced Object Search - Desktop Client
Any Plugin
Bosch Camera Analytics
Hanwha Camera Analytics
Hikvision Camera Analytics
OpenVINO Object Detection
Search
Any time
Any camera
Select area
Object Type
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License Plate
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PNV-A9081R
Bottom Clothing Color Blue
Bottom Clothing Length Long
Gender Female
Hat False
Show on Layout
02 February 2022
12:24:14 PM
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05 February 2022
06 February 2022
07 February 2022
12 PM
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PNV-A9081R
LIVE
SYNC
10:37:33 AM

Nx and AI-Enabled Video Analytics

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What AI-based Analytics Can Nx Integrate With?

Any Computer Vision application can integrate with Nx. And Quickly.

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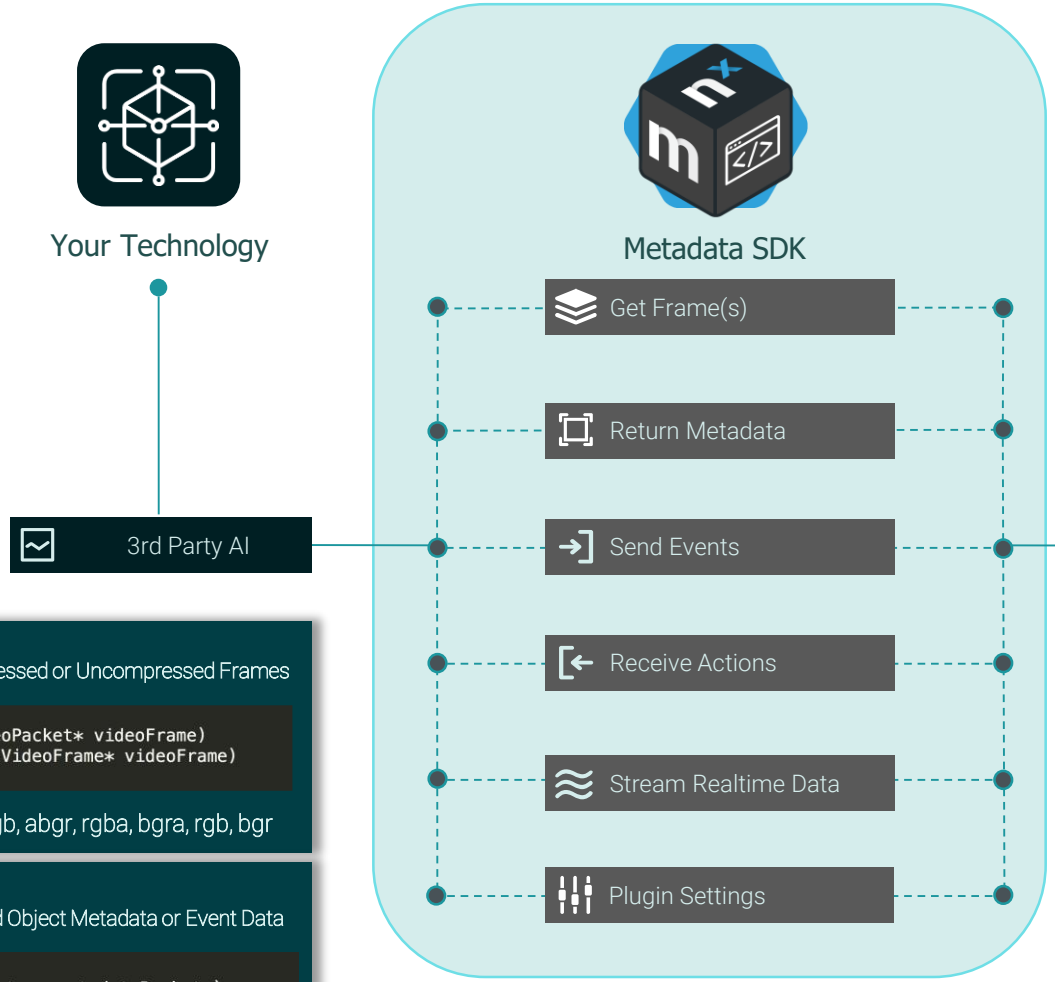
How Does Nx Integrate with AI?

Integrating AI with **Nx Meta** is **simple** and **straightforward.**

1. Download Nx Meta
2. Download Metadata SDK
3. Develop Plugin
4. Add Plugin to Nx Meta



Get Frame(s) — Request Compressed or Uncompressed Frames

```
bool DeviceAgent::pushCompressedVideoFrame(const CompressedVideoPacket* videoFrame)
bool DeviceAgent::pushUncompressedVideoFrame(const UncompressedVideoFrame* videoFrame)
```

Available Pixel Formats: yuv420, argb, abgr, rgba, bgra, rgb, bgr

Return Data — Send Object Metadata or Event Data

```
bool DeviceAgent::pullMetadataPackets(std::vector<MetadataPacket*>* metadataPackets)
bool DeviceAgent::pushMetadataPacket(MetadataPacket* metadataPackets)
```

Use Packets to return Metadata from detected objects and send related events.

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How Does Nx Integrate with AI?

And the results are awesome.

- Objects are ingested and displayed on associated video.
- Object metadata is stored in object database.
- Object search is amazing – search a year's worth of recording in *less than a second.*

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Nx Was Created for Use at the Edge

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Nx Enables Video at the Edge

Nx for Edge Devices

Embed the Nx Server application on custom edge hardware.

Bridge Devices

- Small, low-power ARM-based Servers
- Analytics enabled (e.g. NVIDIA jetson)

All-in-One IP Cameras

- IP cameras w/ a modern ARM chipset and onboard AI-enabled analytics.

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Major Advantages of Nx at the Edge

Nx Server is a turnkey solution.

- All-in-one media server with the ability to run on even the most lightweight chipsets.
- Supports most Linux operating systems.
- No prerequisite or additional software is required. Database included (SQLite).
- Comprehensive server API (CRUD REST)
  - Integrate with existing products seamlessly and painlessly.

Nx Server is continually evolving.

- Every new release includes updates.
- New devices, new ingest stream types, new transcoding capabilities, and more.
- Close to the metal and built to evolve with commodity compute hardware.

Nx Server packages already exist for developer boards.

- Rasperry Pi
- NVIDIA Jetson

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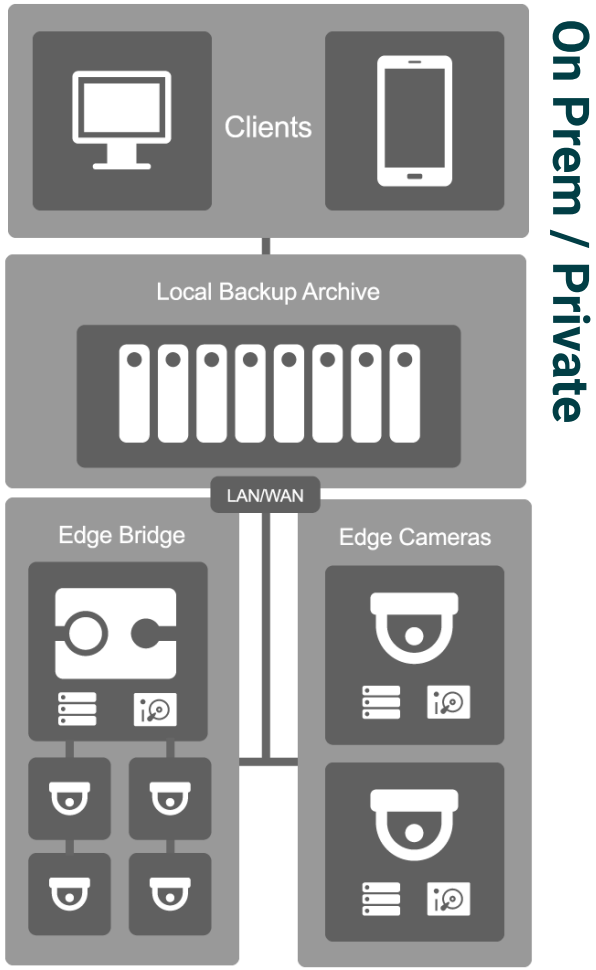
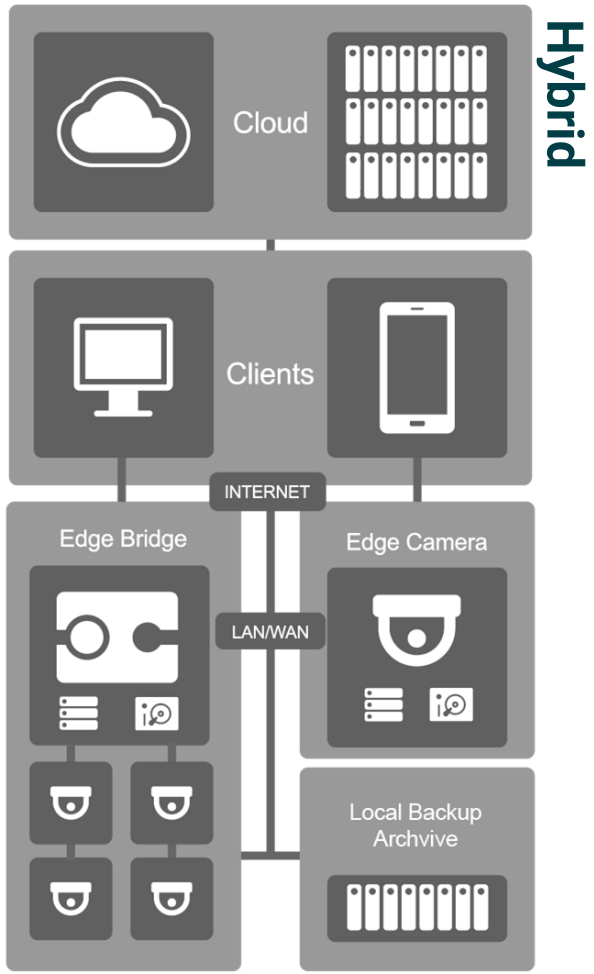
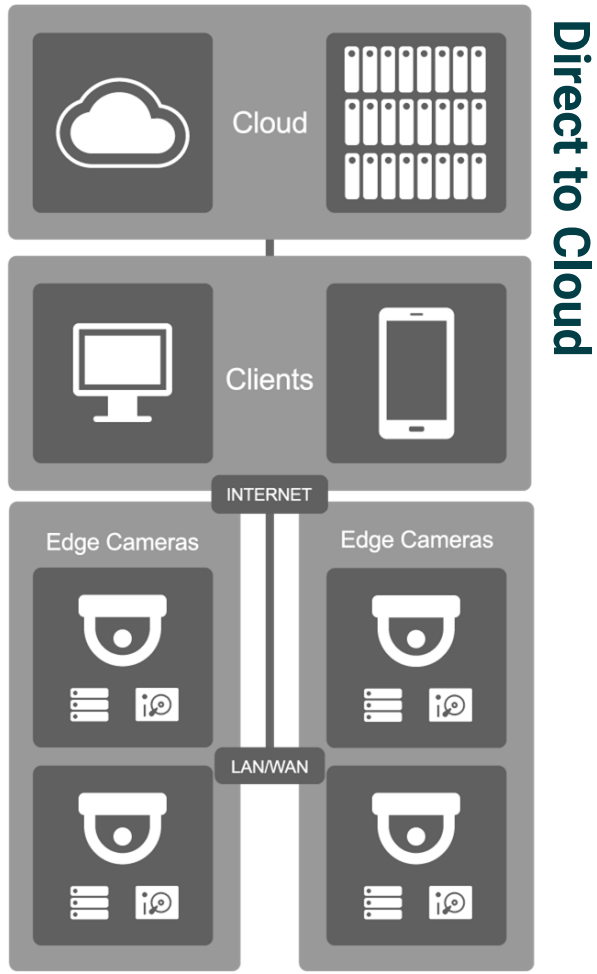
Nx at the Edge
Flexible architectures to suite any need



On Prem / Private



Hybrid



Direct to Cloud

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What Can You Build with Nx Meta?

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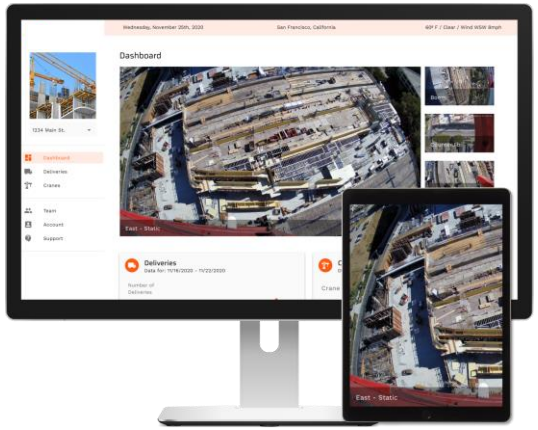
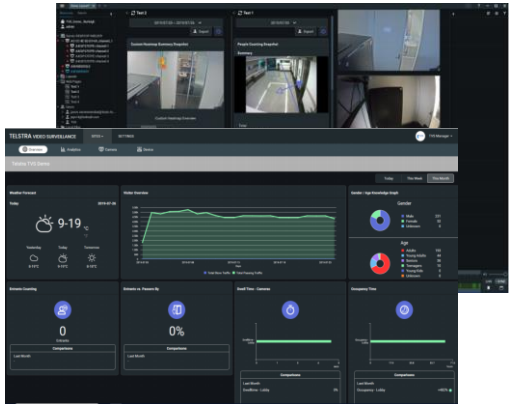
Whatever You Want



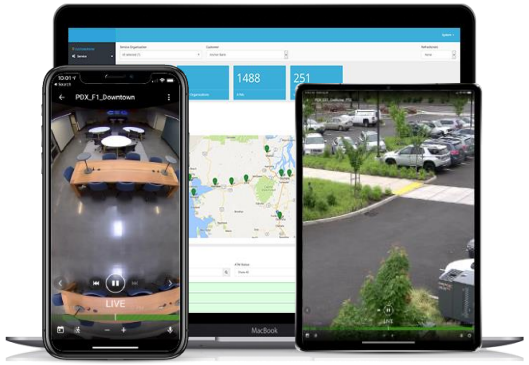
Construction Management

Retail Analytics

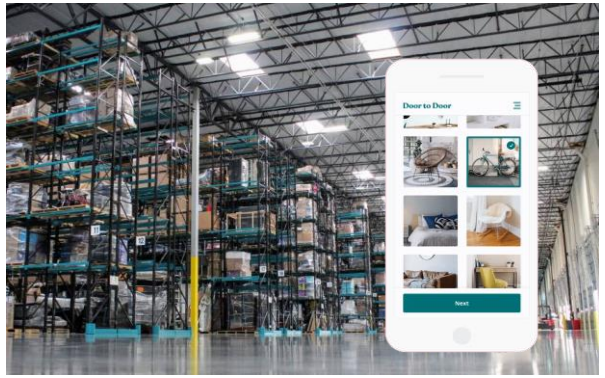
Mining Monitoring



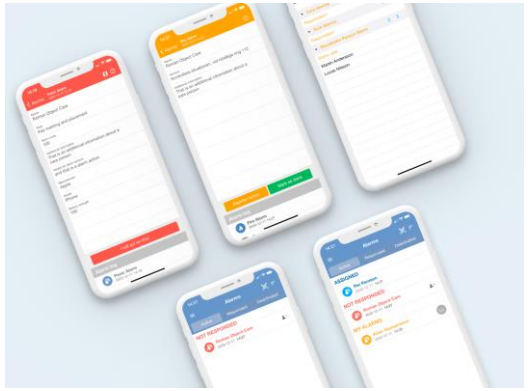
Carrier Solution



Managed Services



Logistics Management



Elderly Care

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