Device Inventory - Nexthink Application

# Overview

The Nexthink Device Inventory application is a comprehensive Streamlit dashboard that provides insights into device inventory data from the Nexthink platform. This application enables users to analyze device information across multiple dimensions including hardware specifications, organizational structure, and modern desktop adoption.

# Application Design

## Architecture

The application follows a modular design pattern with the following key components:

**1. Data Layer:** Connects to Snowflake using Snowpark sessions to retrieve device inventory data

**2. Filter Layer:** Provides comprehensive filtering capabilities across 11 different dimensions

**3. Visualization Layer:** Uses Plotly for interactive charts and data grids

**4. Caching Layer:** Implements Streamlit caching for improved performance

## Key Features

**•** Real-time Data: Connects directly to Snowflake for up-to-date device inventory information

**•** Comprehensive Filtering: 11 different filter options for granular data analysis

**•** Interactive Visualizations: Plotly-based charts with professional styling

**•** Responsive Design: Optimized for various screen sizes and devices

**•** Error Handling: User-friendly error messages with technical details for administrators

**•** Dual Metrics Display: Side-by-side comparison of Modern vs Non-Modern desktop devices

# Filter Options

The application provides 11 comprehensive filters:

**1.** Date Range: Select time period for device data analysis

**2.** Hardware Type: Filter by device hardware type (laptops, desktops, etc.)

**3.** Hardware Manufacturer: Filter by device manufacturer (Dell, HP, Lenovo, etc.)

**4.** Device Entity: Filter by device entity classification

**5.** Show Modern Desktop: Filter for modern desktop devices (Yes/No/All)

**6.** Department: Filter by user department

**7.** Org Level 5: Filter by organizational level 5

**8.** Org Level 4: Filter by organizational level 4

**9.** Org Level 3: Filter by organizational level 3

**10.** Org Level 2: Filter by organizational level 2

**11.** Org Level 1: Filter by organizational level 1

# Visualizations

## 1. All Current Devices (Data Grid)

**Purpose:** Comprehensive view of all devices matching filter criteria

**Data Source:** *NEXTHINK.REPORTS.V\_REPORT\_DEVICE\_INVENTORY\_CURRENT\_ALL*

**Features:**

**•** Sortable columns

**•** Full device details including Last Seen, Hardware Type, Manufacturer, Device Entity, Department, and Org Levels

**•** Responsive table design

**•** Device count summary

**•** Supports all 11 filter criteria

## 2. Modern Desktop Device Count by Department (Horizontal Bar Chart)

**Purpose:** Analyze modern desktop adoption across departments

**Data Source:** *NEXTHINK.REPORTS.V\_REPORT\_DEVICE\_INVENTORY\_CURRENT\_ALL*

**Features:**

**•** Horizontal bar chart for better readability

**•** Sorted by device count (descending)

**•** Dynamic height based on number of departments

**•** Interactive hover information

**•** Handles null departments by displaying as "N/A"

**•** Filtered by date range

## 3. Desktop Device Summary (Dual Score Cards)

**Purpose:** Key metrics showing both Modern and Non-Modern desktop device counts

**Data Source:** *NEXTHINK.REPORTS.V\_REPORT\_DEVICE\_INVENTORY\_CURRENT\_ALL*

**Features:**

**•** Two side-by-side metrics for complete desktop inventory view

**•** Modern Desktop Devices: Count of devices with names starting with "ID"

**•** Non-Modern Desktop Devices: Count of devices with names not starting with "ID"

**•** Filtered by date range and department

**•** Helpful tooltip information for each metric

# Technical Implementation

## Dependencies

**•** Streamlit 1.44.0: Web application framework

**•** Plotly: Interactive visualization library

**•** Scikit-learn 1.3.0: Machine learning utilities

**•** Python-dateutil 2.8.2: Date handling utilities

**•** NumPy 1.24.3: Numerical computing

**•** Pandas: Data manipulation and analysis

**•** Snowflake Snowpark: Database connectivity

## Data Sources

The application connects to the following Snowflake views in the REPORTS schema:

### Main Data Views:

**•** *NEXTHINK.REPORTS.V\_REPORT\_DEVICE\_INVENTORY\_CURRENT\_ALL*: Primary device inventory data

### Filter Data Views:

**•** *NEXTHINK.REPORTS.V\_REPORT\_FILTER\_HARDWARE\_TYPES*: Hardware type filter options

**•** *NEXTHINK.REPORTS.V\_REPORT\_FILTER\_HARDWARE\_MANUFACTURERS*: Hardware manufacturer filter options

**•** *NEXTHINK.REPORTS.V\_REPORT\_FILTER\_DEVICE\_ENTITIES*: Device entity filter options

**•** *NEXTHINK.REPORTS.V\_REPORT\_FILTER\_DEPARTMENTS*: Department filter options

**•** *NEXTHINK.REPORTS.V\_REPORT\_FILTER\_ORG\_LEVELS*: Organizational level filter options (all 5 levels)

## Performance Optimizations

**1. Caching Strategy:**

**•** Filter options cached for 1 hour (@st.cache\_data(ttl=3600))

**•** Data queries cached for 1 hour

**•** Session state management for filter persistence

**2. Query Optimization:**

**•** Dynamic WHERE clause generation with build\_filter\_condition() helper function

**•** Efficient filter combinations using IN clauses

**•** Single query for dual metrics using CASE statements

**•** Minimal data transfer with targeted queries

**3. UI Optimizations:**

**•** Form-based filtering to reduce unnecessary queries

**•** Progressive loading with user feedback

**•** Responsive design for various screen sizes

**•** WebGL-safe Plotly configuration

# Modern Desktop Classification

The application identifies "Modern Desktop" devices using the following criteria:

**•** Device names that start with "ID" (case-insensitive: *UPPER("Device Name") LIKE 'ID%'*)

**•** This classification helps organizations track their modern desktop deployment progress

**•** Both positive and negative counts are displayed for complete inventory visibility

# Usage Instructions

**1.** Launch the Application: Open the Streamlit app in your browser

**2.** Configure Filters: Use the sidebar form to select desired filter criteria

**3.** Apply Filters: Click "Apply Filters" to update the dashboard

**4.** Analyze Data: Review the three visualizations:

**•** Browse detailed device inventory in the data grid

**•** Analyze department-wise modern desktop adoption in the bar chart

**•** Compare modern vs non-modern desktop counts in the summary metrics

**5.** Export Data: Use browser functionality to export visible data

# Future Enhancements

Potential areas for future development:

**1. Additional Visualizations:**

**•** Time series analysis of device trends

**•** Geographic distribution mapping

**•** Hardware age and lifecycle analysis

**2. Export Functionality:** Direct CSV/Excel export capabilities

**3. Advanced Filtering:**

**•** Date range comparisons

**•** Custom filter combinations

**•** Saved filter presets

**4. Alerting:** Automated alerts for device inventory thresholds

**5. Mobile Optimization:** Enhanced mobile device support

**6. Real-time Updates:** Live data refresh capabilities

**7. Advanced Analytics:** Predictive analytics for device replacement planning