iX 2.20 - Performance improved
Objectives for the iX 2.20 upgrade

1. Improve performance
2. Introduce new architecture
3. Introduce new database support
4. Add new functionality
5. Add Windows 8.1/10 support
1. Improve performance

- Performance improvement has been the most urgent request by our customers
- We have based our priorities and efforts on analysis of the most common problems in customer projects
1.1 Performance - Screen switch time

▶ Screen cache
  - Number of screens depended of panel memory
    (iX TxA ~30-60 screens)
    - Pop up screens will not be cached
  - Intelligent handling. Least used screen will be disposed when cache is full

▶ Changed behavior
  - Script should use open/close event. Not just iX to dispose
    - Timers etc. will keep value, startup screen always cached, reduced garbage collection
    - Default cached screens, property to disable
  - Removed pre load screen
    - The total startup time will not be higher than 2.10

▶ Benefit
  - 2-10 times faster depending of screen complexity
    (more complex -> faster)
    - First screen switch there is no improvement
1.2 Performance - Value update

- Value update
  - UI refresh limit removed

- More efficient use of CPU power
  - Objects and bindings are optimized to reduce CPU load
  - Dynamic load limit to prevent system from choking
    - General higher CPU load

- Benefit
  - Faster graphic update on screen
1.3 Performance - Value update

- Value update optimization
  - iX 2.10: Value was not updated until after read back from PLC
  - iX 2.20: Value is written immediately in HMI before written to PLC

- Same behavior as many other competitors HMIs and as in Exter

- Benefit: Faster value update on screen
  - Test iX 2.10: 4 sec
  - Test iX 2.20: 0 sec
1.4 Performance - Transparency removal

- Objects with built-in bitmaps will render without transparency
  - Styled buttons
  - Circular meter
  - Linear meter
  - Trend viewer
  - Certain conditions must be fulfilled, e.g. no dynamics

- Conditions are determined in design mode
  - Optional property to force transparency (iX 2.10 behavior)

- Benefit
  - Significant faster screen refresh/screen switch
  - Better graphic appearance, smoother edges
1.5 Performance - Reuse of bitmaps

- **Button**
  - Most common object
- **Duplicates of button picture removed**
  - 3 styles (Up, Down & Disable)
  - iX 2.10: 3 x 1000 identical buttons -> 3000 pictures
  - iX 2.20: 3 x 1000 identical buttons -> 3 pictures
- **Test project**
  - iX 2.10: 4600 bitmaps, file size 4.6MB
  - iX 2.20: 1300 bitmaps, file size 1.3MB
- **Benefit**
  - Screen switch time reduced
  - Memory size reduced
  - Project transfer time reduced
1.6 Performance - XML file generation

- Optimized XML file generation
- Tags.neo and Controller.neo
  - In iX 2.10 the files could be gigabytes. i.e. exceed the limit of 32 bit Windows system
- Test project
  - iX 2.10: 600 000 lines of XML, 60MB
  - iX 2.20: 170 000 lines of XML, 13 MB
- Benefit
  - Design mode: Better performance on 32 bit Windows system
  - Runtime: Decreased screen switch time
1.7 Performance - Function keys

- Optimized Function key code generation
  - iX 2.10: If one single function key was used, it generated code for all keys on all screens
  - iX 2.20: Code is only generated for just the key on the screens where it is used

- Test project
  - iX 2.10: 140 000 lines of C# code, 7MB, 25 sec added startup time
  - iX 2.20: 100 lines of C# code, ~0 MB, ~0s added startup time

- Benefit
  - Faster boot up time
1.8 Performance - Lightweight tag

- Lightweight tag
  - Include only the most common tag properties
    - For properties that affect, see separate doc
  - Automatic switch to standard tag if needed
    - Cross reference in script

- Benefit
  - Decreased memory consumption. Reduce 3KB/tag (12 MB for 4000 tags)
  - Reduced CPU load
  - Decreased screen switch time
  - Reduced start up time
1.9 Performance - Start up time

- Report
  - Updated report component
  - iX 2.10: 30-60 sec
  - iX 2.20: 1-3 sec

- General improvements
  - Removed JIT heap-cleaning
  - Suppressed “Notify property change” --> No sorting of list until runtime have started
  - Hashkey optimization
  - Will generate performance improvement proportional to project size
1.10 Key beep

- Change of behavior
  - iX 2.10: Always beep when screen was touched
  - iX 2.20: Only beep when pressing objects that initiates an action
1.11 Installation

- Only one setup file
  - Larger installation file due to support for new products
- New look during installation
- Windows 8.1/10 requires reboot
  - 32 and 64 bit
  - Microsoft require framework 4.5 downloaded from web (if not already on target)
2.1 Database

- New database: SQLite
  - Implemented according with alignment of Microsoft strategy. SQL CE will go EOL in future products
  - SQLite is default database in new and converted projects (possible to switch between SQL CE vs SQLite)
  - Extended life time on SSD
  - SQLite is the recommended database to use

- Improved functionality
  - No erasure of existing data when downloading recipes or logger (unless structure is changed), e.g. only the changed recipes.
    A warning will be shown if data will be deleted
  - Database size adapted to panel disc size
  - New system tags
    - Database Error Active
    - Database Error Message
    - Database Max Size Exceeded (Setting in Project group)
  - New Action: Back up all databases for recovery
    - Easy to schedule full database backup to be used if recovery is needed
  - User setting: Max size of db
2.2 Database

- New Storage provider (API)
  - Intended for future use
  - Usage of DLL files for external database connectivity is not supported by SQLite
  - Supports REST API for communication
    Requires web server on external data base

- Increased startup time first time after download
  - First time a converted project startup a update process needs run
3. Operating system

- **Windows 8.1 support**
  - Metro startup menu is suppressed in startup when running iX PC Runtime
  - Desktop is shown

- **Windows 10 support**

- **Windows XP**
  - No longer supported due to Microsoft EOL

- **Windows Vista**
  - No longer supported on iX PC Runtime
  - Supported on iX Developer, will be removed in future versions

- **Windows 7 support**
  - Continue as previous versions
4.1 New functionality

- New object
  - Tag monitor
  - Monitor and edit all tags from project in Runtime

- Support for read/write Expressions on tags

- Support for foreground screen
  - Previously only background screen

- Updated panel wizard

- Support for passive value change events
  - The passive event will only trigger when the tag is active

- Reduced info in output window during build

- Info at startup about changes
  iX 2.10 -> iX 2.20
  - Project upgrade guide
4.2 New functionality

- Added backup functionality during project conversions
- Updated components
  - Report generator
  - Media player
  - PDF viewer
- New Chinese virtual keyboard
- Improved Security handling
  - Possible to change “AutomaticLogoutMinutes” and “AutomaticLogoutEnabled” via script
5. Bug fix

- ~20 bug fixes
  - See Release notes
6. Introduce new architecture

- Module based architecture
- Start of API structure for 3rd part development
- Will enable faster development and streamlined testing
- ... and lead to better quality
Summary

- 2-10 time faster on existing products
  - Dependent of type of project
  - Larger project will gain more improvement

- What’s improved in iX 2.20?
  - Boot up time ....................... Shorter
  - Screen switch time ............... Shorter
  - Value update rate on screen .... Faster
  - Project size ....................... Smaller
  - Transfer time ..................... Shorter
  - Memory usage ..................... More efficient
  - CPU usage .......................... More efficient

- Preparing for future products
  - Cloud solution, Client/Server
  - 3rd part development
iX 2.20 - Release package

- Press release
- PPT
- Documentation
  - iX User Guide
  - iX Reference manual
  - iX 2.10 -> iX 2.20 Project upgrade guide
  - Script update
- iX 2.20 releases
  - iX Developer 2.20
  - iX Runtime 2.20
  - New demo project
- Video tutorials
  - Following the steps will create project equal to new demo project
Looks good, works great
The combination that adds wow to work

- The iX HMI solution combines stable and intuitive software with reliable, industrial-grade hardware

- The perfect choice for any industrial application:
  - Easier to operate
  - Easier to make it your own
  - Easier to engineer

- One tool for all platforms
  - iX TxA, iX TxB, iX TxC
  - iX TxA-SC, iX TxB-SC, iX TxB SM
  - iX TxAM, iX TxBR
  - Q-Term
  - iX PC RT

- Functionality level
  - Advanced HMI / SCADA lite