



# Krunch Pipeline

**AVEVA**

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# The Need for Krunch Extensibility

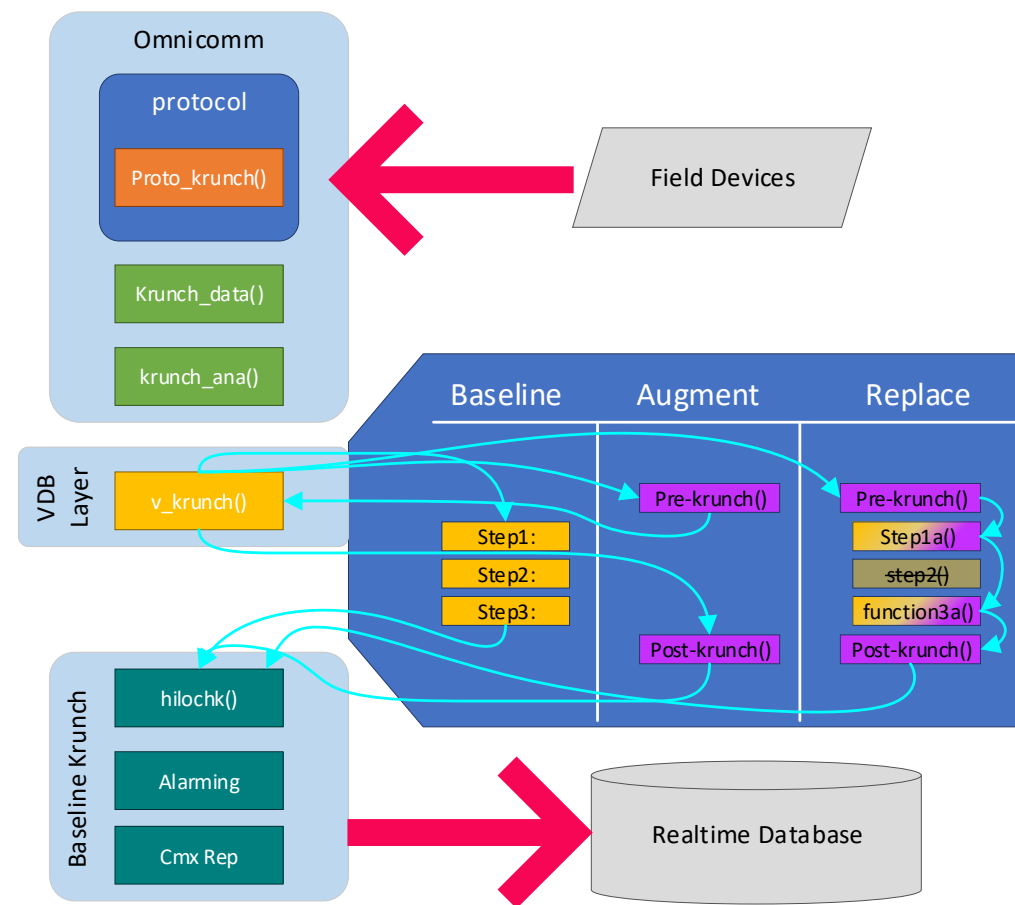
## What it is, and who needs it

- What is “Krunch”?
  - Take a buffer for bytes from the protocol
  - Turn that buffer into a number
  - Find the point in the database to update
  - Convert the number into a value
    - Eng Units, scale, range, etc
  - Smooth it, filter it
  - Assess it for alarm threshold violations
  - Calculate
    - Statistics: min/max/avg/starts/runtime
    - Higher order: volume to flow etc
  - Trigger other actions
    - ACE routines
    - Collect to historical
    - Replicate to other systems
    - PubSub publish
- Why does it need to be extensible?
  - Customers and SIs routinely require additional functionality for processing raw data on its way to the database
  - Examples
    - Point replacement: replace the value with another point
    - Custom DQ: assess additional criteria and store custom flags on the point
    - Custom Raw Data Manipulations: masking, swapping, validations that are unique to the field device/protocol

# VDB Overrides

## Today's Krunch Extensibility

- VDB Overrides
  - Well established in the product
    - Baseline makes heavy use of this everywhere as part of the fundamental design of the CMX Realtime database
  - Not well documented
    - Lots of knowledge in the senior developers however
  - Reliance on baseline source
    - Low to none: for simple overrides that add something to the start or end of the baseline process [augment]
    - High: for complex overrides that change how baseline does something today [replace]
    - Baseline source is 1 or 2 libraries, >1000 lines each + project/solution files etc.
  - When used well, greatly simplifies upgrades
    - GRT would have been far worse had they not tried to stay within the VDB override lane.
    - Shell didn't keep within this lane, and touched everything...
  - Product doesn't make it obvious when overrides are present
    - Must know to look for timestamps of binaries etc. to tell if they are not baseline
  - Only exposes a small part of the Krunch process



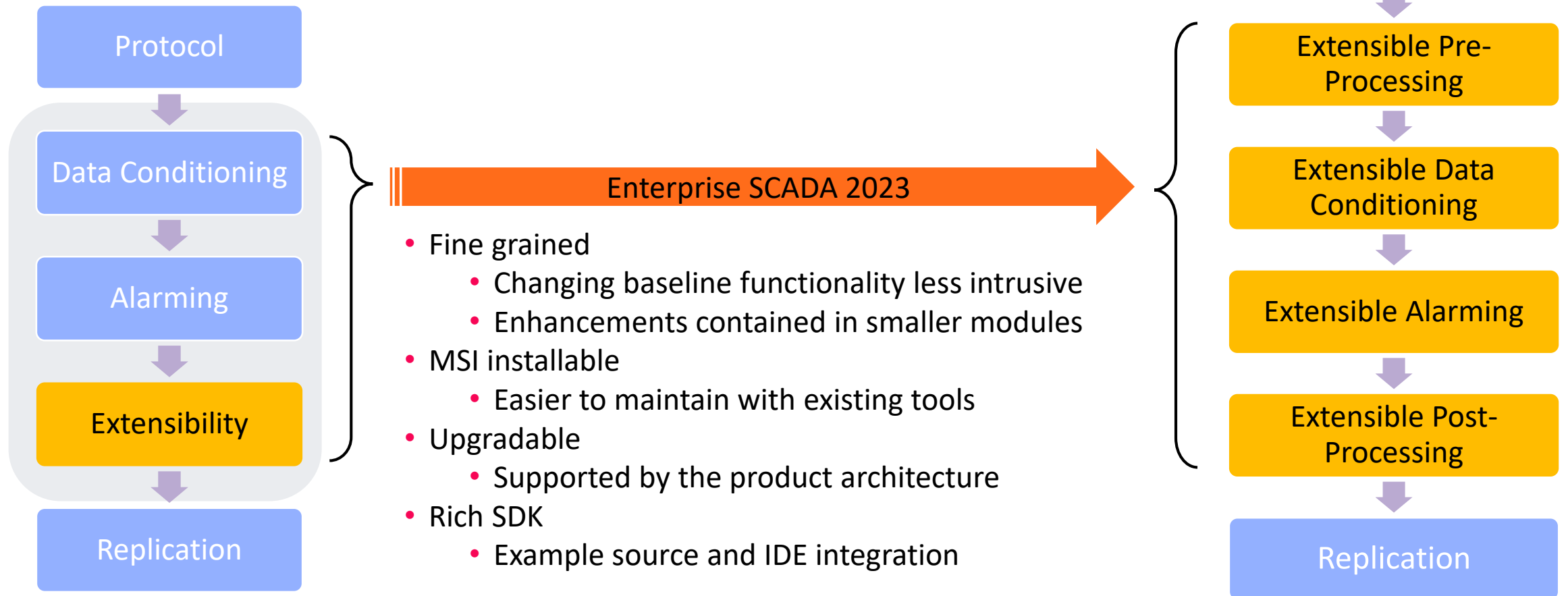
# Krunch Pipeline Value Proposition

## Tomorrow's Krunch Extensibility

- A modern design, using managed code
  - Easier to test, easier to integrate with as a developer
- Based on a new Execution Framework design
  - Framework itself will be closed source, as will most of the Krunch Pipeline itself will be closed source.
  - Framework can be used for other sub-systems in the future (alarming, other CRM, cloud hybrid)
- Pipeline Steps delivered with source
  - Each "Step" is a re-factored bit of the current krunch process
  - Steps are very small bits of functionality, ~ 30 lines of code in the whole file, of which 20 are the same for every step.
    - No need to provide the whole file, nor to pick and choose bits to hand over to projects
  - Documentation for each Step will only be to a level that compliments the source provided
  - Projects would then start with the source, and build from there
- Product ensures that overrides are obvious
  - Stores them in the DATAROOT
- Upgradability
  - Custom Steps will have to be re-evaluated as part of the upgrade
    - May no longer be required: baseline now has the desired feature
    - May need to be changed: other baseline Steps may have changed, and hence the custom Step will need to accommodate the changes
  - Any changes to baseline KP Steps will be captured in the "changes" doc, with which every FEED should start with a review
- Must I use it?
  - For new custom functionality on 2023+: yes
  - For existing VDB overrides: nice to have, will make the next upgrade easier
- Benefits to AVEVA
  - Eliminates more RED code. Easier to support. No more source code requests. Instrumentation out of the box for troubleshooting and finger pointing.
- Benefits to SI's
  - Source provided with baseline. Easier to customize. Better support for troubleshooting.
- Benefits to Customers
  - More flexibility in data gathering that can come after project commissioning. No need to recompile the world, and no forklift upgrades to add new functionality

# Krunch Pipeline – Simplified Overview

## Expanding the Extensibility of AVEVA™ Enterprise SCADA



- Enterprise SCADA 2023
  - Fine grained
    - Changing baseline functionality less intrusive
    - Enhancements contained in smaller modules
  - MSI installable
    - Easier to maintain with existing tools
  - Upgradable
    - Supported by the product architecture
  - Rich SDK
    - Example source and IDE integration

# Krunch Pipeline

## Detailed Overview

