



Niagara Developer Basics

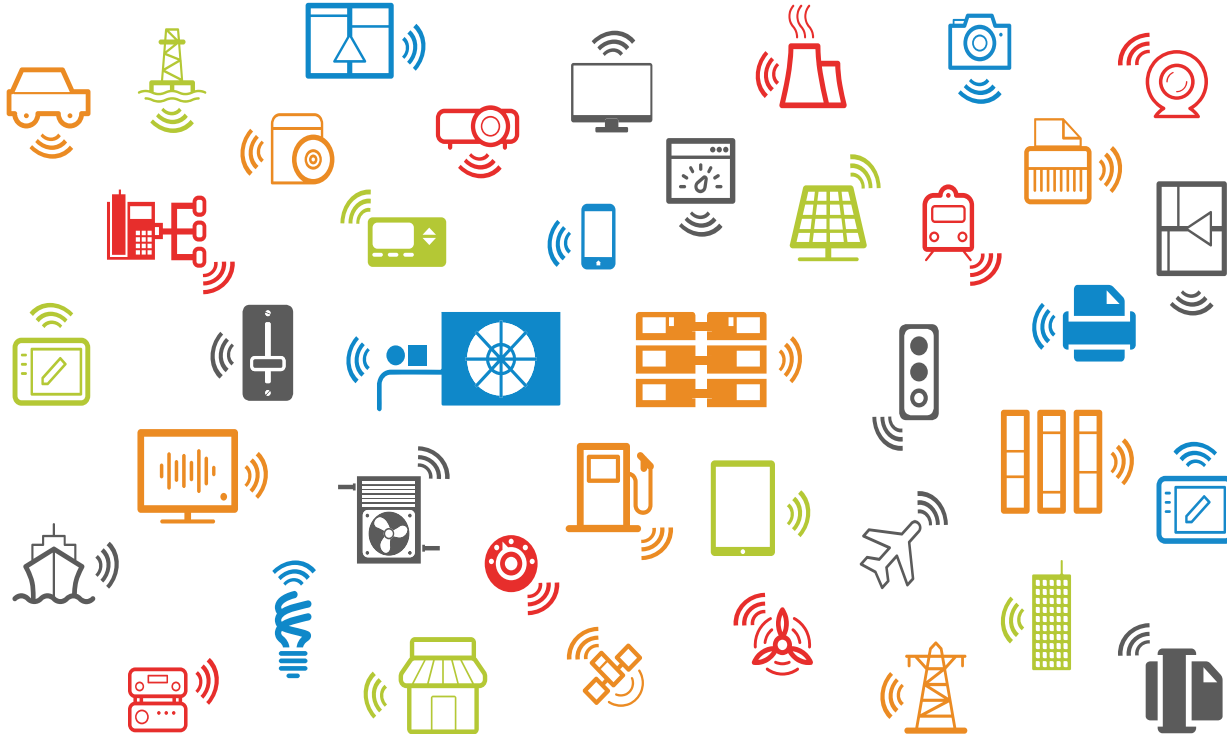
Scott Hoyer

Tridium Software Engineer

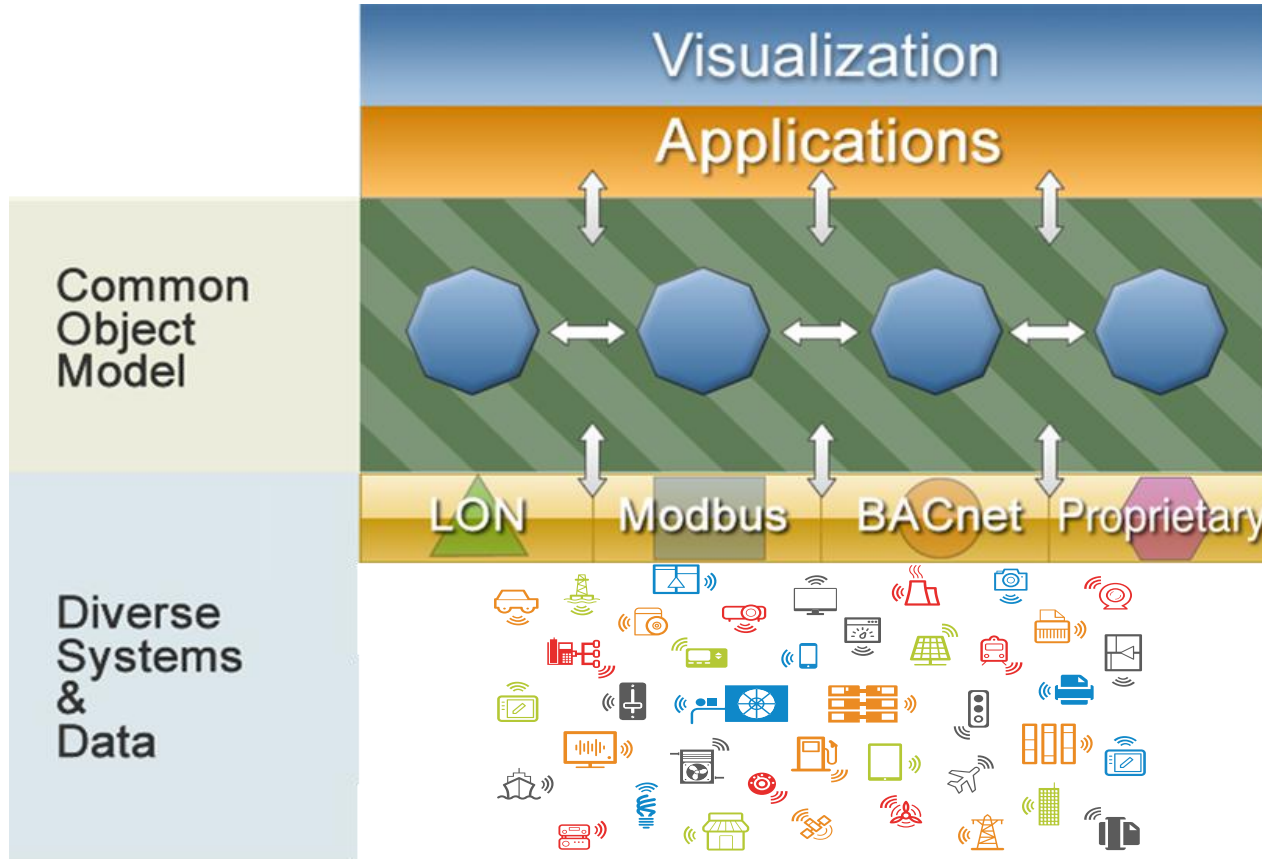
Agenda

- Problem Space
- Architecture
- Object/Component Model
- Demo
- Driver Framework Intro

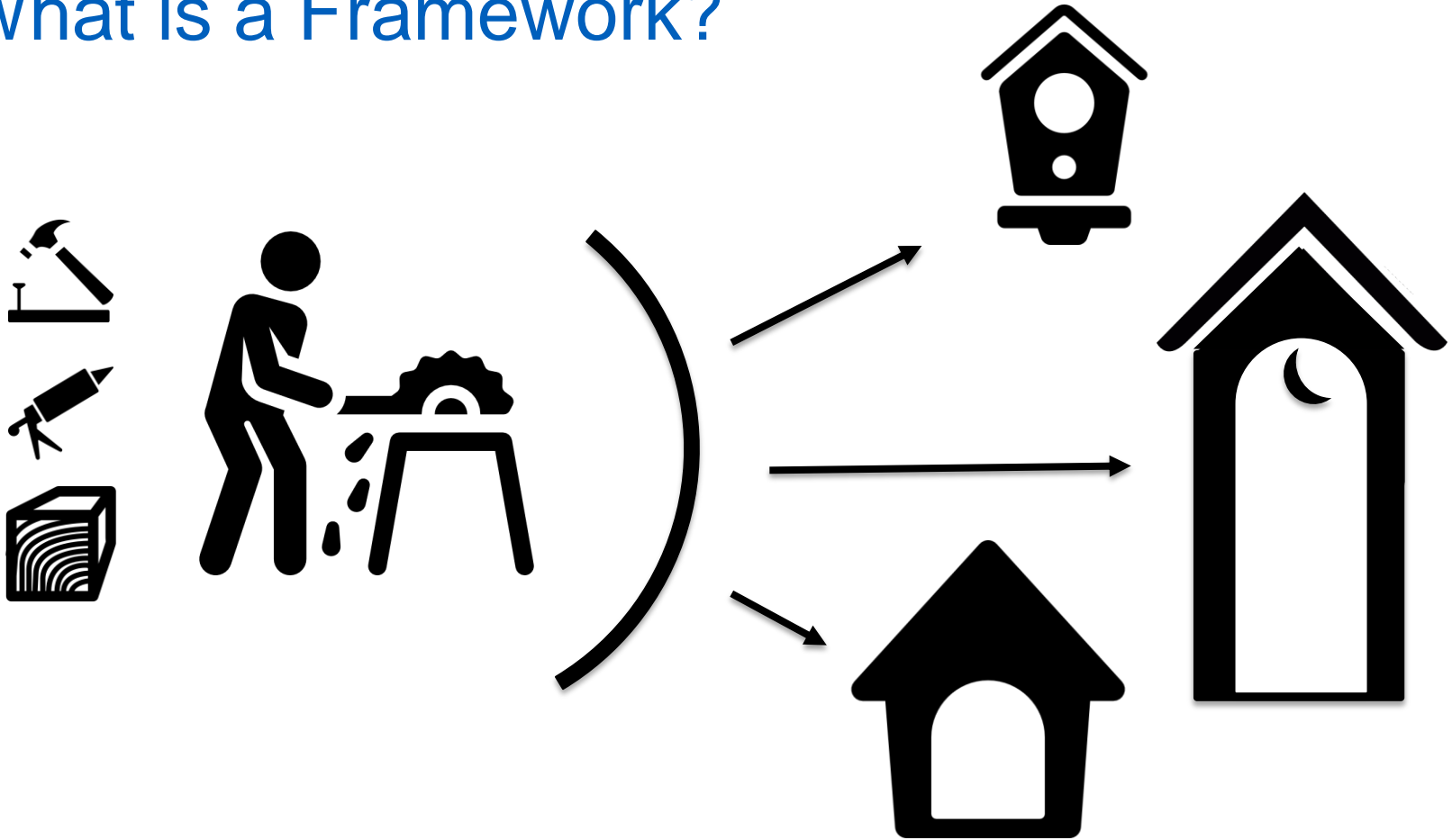
Niagara Problem Space



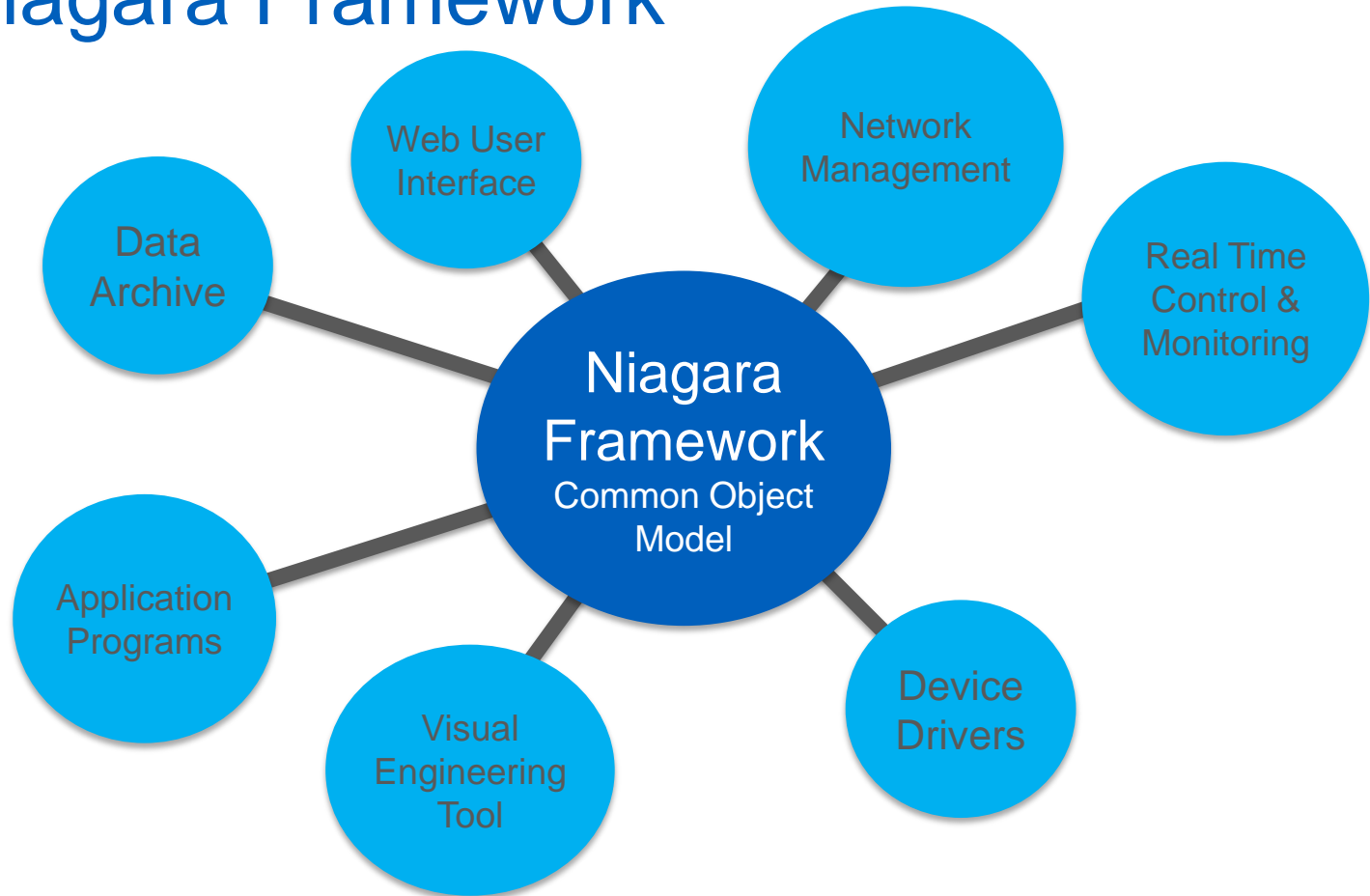
Niagara Problem Space



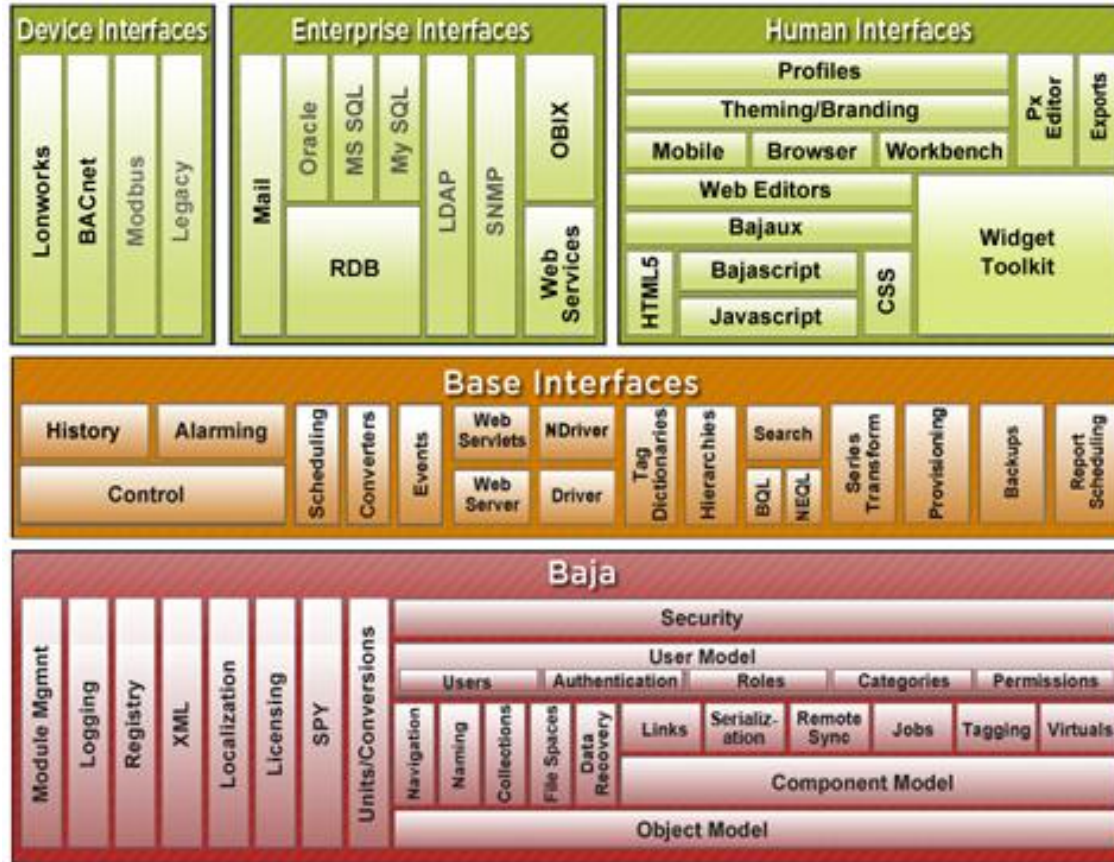
What is a Framework?



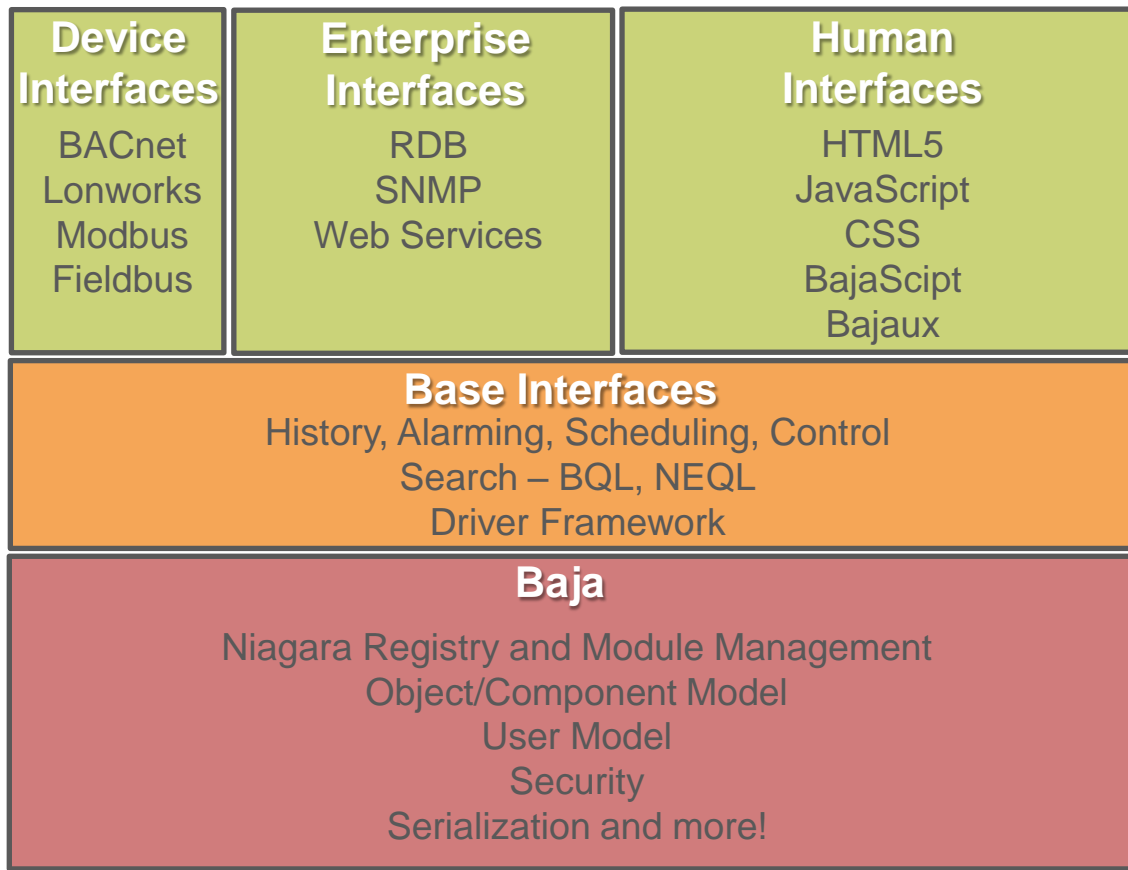
The Niagara Framework



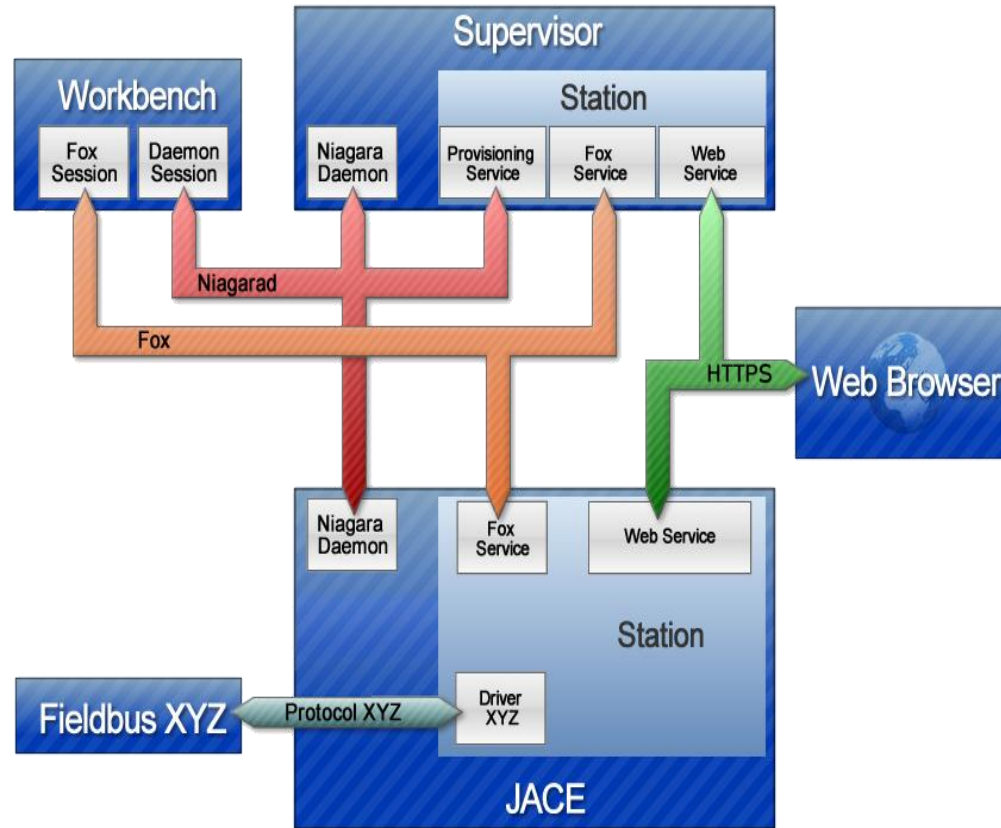
Niagara Software Stack



Niagara Software Stack



Niagara System Architecture



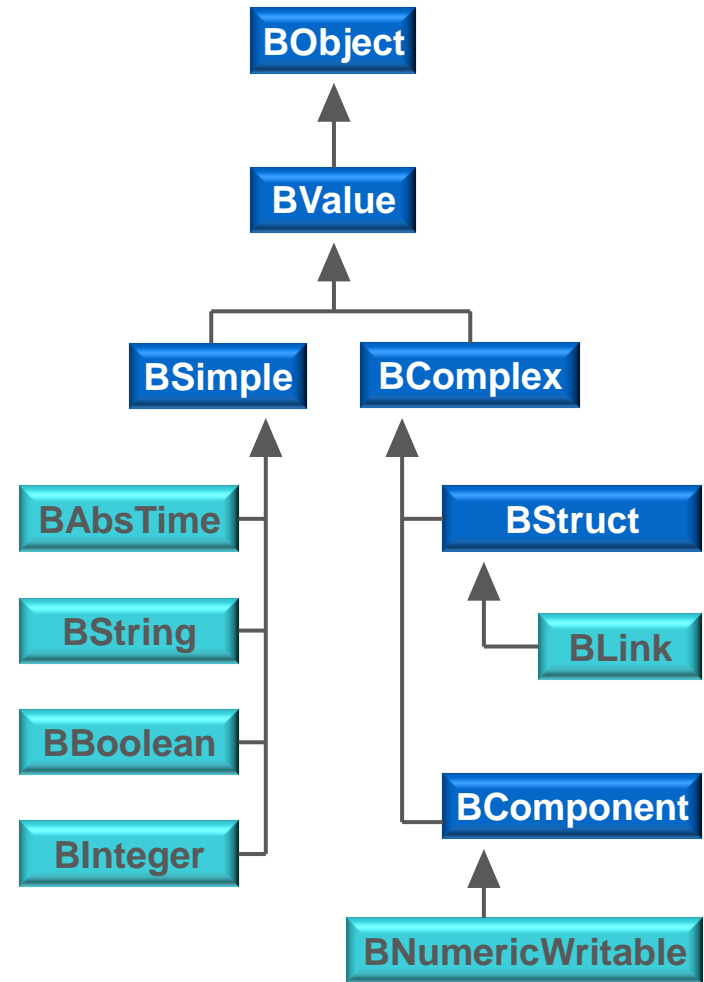
Niagara
Software
Stack



The Niagara Object Model

Niagara Types provide global identification and allow for relationships between Types

All Niagara Types are stored in the **Niagara Registry**



The Niagara Component Model

BComponent is a collection of **Slots**:

- **Property** – storage of another Niagara object (BValue)
- **Action** – behavior that can be invoked by a user or event
- **Topic** – the subject of an event (event source)

Frozen vs. **Dynamic** Properties

BComponent

BComponents mounted in a Station “tree” and **linked** together to form logic

BComponent Benefits

Normalization - Seamless integration with other BComponents

Application - Assembled using graphical tools (Workbench)

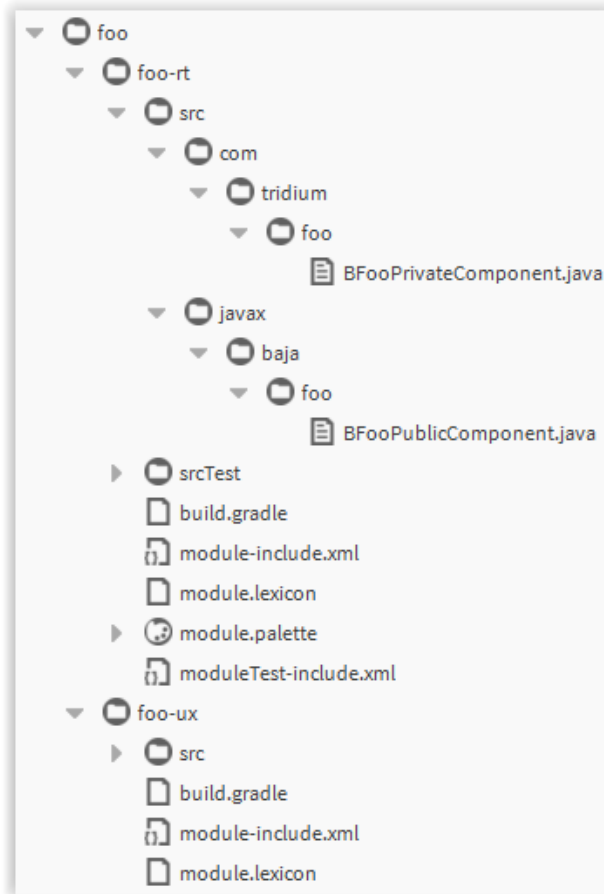
Visualization - Support for standard and custom views (Web accessible)



Plug into Niagara with Modules

Modules (.jar files) allow you to distribute your code using common tools

Build modules using **Gradle**



Demo

Blackjack Game

You Win!

Your Total: 21	
♥	3 of Hearts
♣	Queen of Clubs
♠	8 of Spades

...

Dealer Total: 19	
♠	2 of Spades
♦	9 of Diamonds
♦	8 of Diamonds

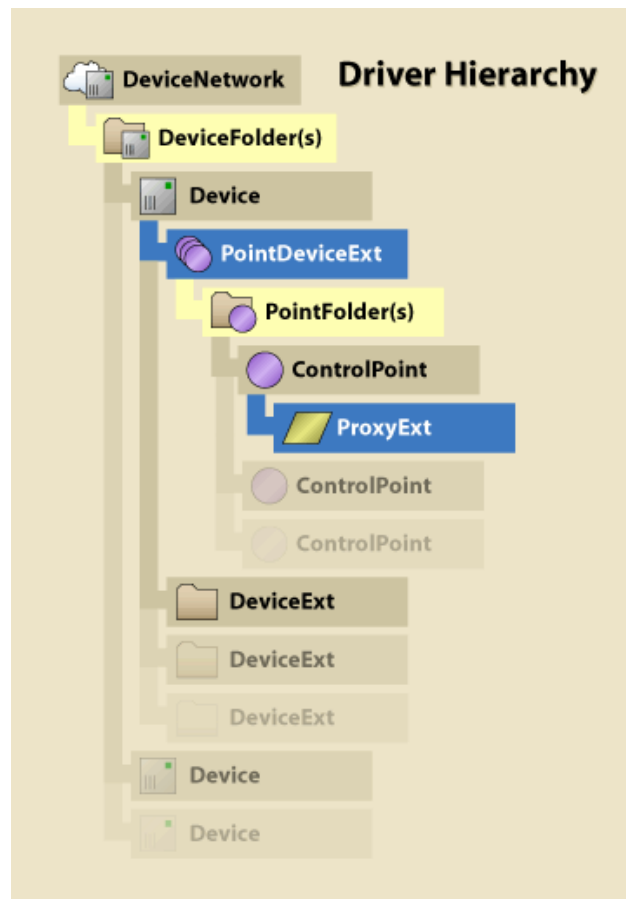
⚡ New Game ⚡ Hit ⚡ Stand

Driver Framework Architecture

Network/Device centric

Normalize data to Niagara **points, histories, schedules, alarms**, etc.

All drivers have the same **look and feel**



Proxy Points to Normalize Driver Data

Standard control points with a custom
Proxy Ext

Property Sheet

N Numeric Point (Modbus Register 30001) (Numeric Point)

Facets units=°F,precision=1 °F,min=-inf °F,max=+inf °F >> ⌚

Proxy Ext Modbus Client Numeric Proxy Ext

Status {ok}

Fault Cause

Enabled ☒ true

Device Facets units=°F,precision=1 °F,min=-inf °F,max=+inf °F >> ⌚

Conversion Default

Tuning Policy Name Default Policy

Read Value 72.0 °F {ok}

Write Value 0.0 °F {ok}

Poll Frequency Normal

Data Address Modbus 30001

Absolute Address Modbus 30001

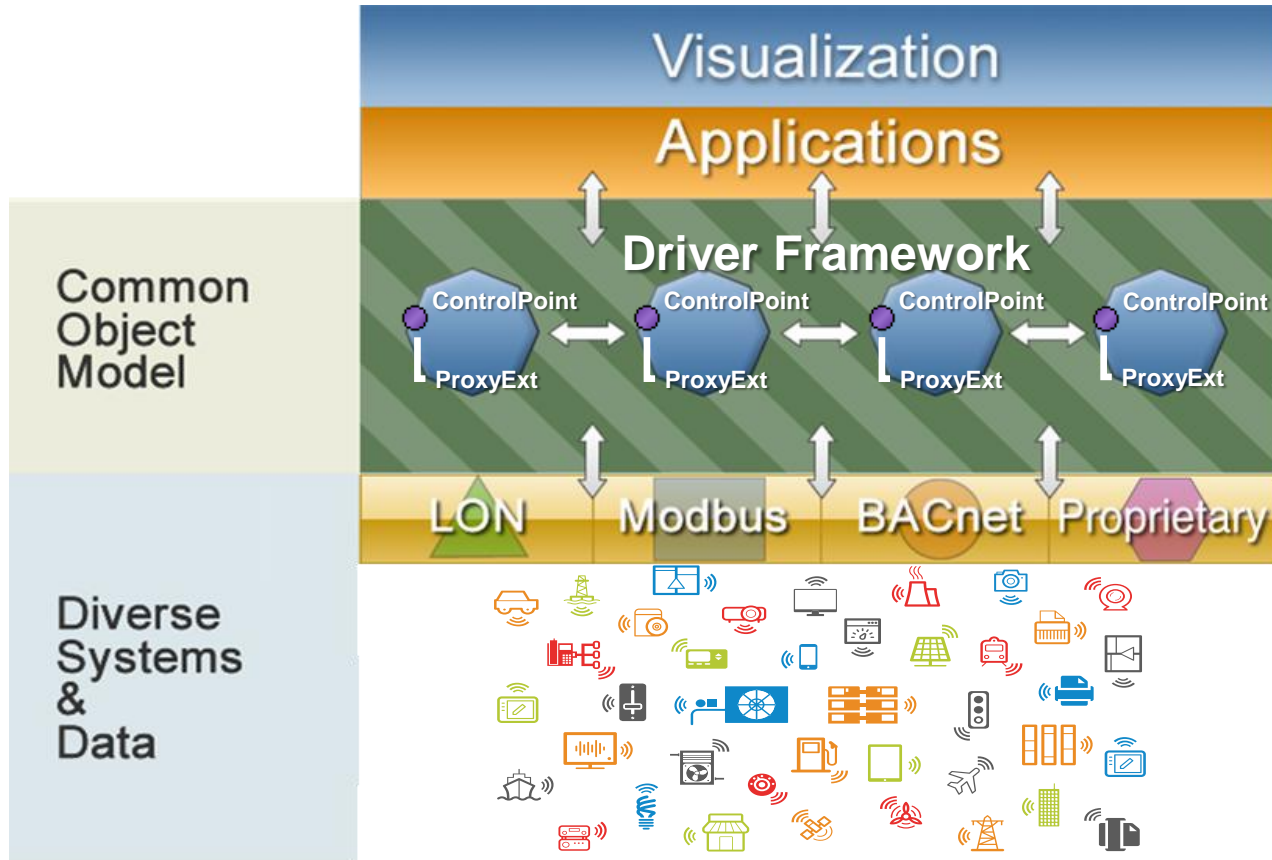
Data Source Point Poll

Reg Type Input

Data Type Integer Type

Out 72.0 °F {ok}

Niagara Problem Space



Questions?

For more information, please visit

niagara-central.com