



CAD Workflow Editor

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November 2019

Introduction

- Trainer and Student Introductions
- Logistics
 - Daily Schedule
 - Luncheons
 - Restrooms
 - Hardware
- Training Material
- Credentials for Login

Agenda

- Introduction
 - Macros shortcoming
 - What is workflow foundation
 - Architecture and core concepts
 - Real life examples
- CAD Workflow Editor
- Introduction to Client Workflows
 - Location for client workflow files
 - Client workflow components
 - Variables and arguments
 - Workstation command demos
 - Choose and build new workflows
- Custom UI Workflows
 - Location for UI workflow files
 - New commands
 - Build new UI workflow.
- IFCADDirect
 - History of Interoperability Framework for CAD
- Introduction to IFCADDirect Workflows
 - Why IFCADDirect
 - Location for IFCADDirect workflow files
 - IFCADDirect components
 - IFCADDirect demo
 - Build New IFCADDirect workflows

Macros

Macros

- Execute multiple tasks with a single command
- Works for command line, right-clicks and buttons
- For example,
 - Logon Unit, Assist Unit, Logoff Unit

Macros

Create Macro

Macro Name: Macro Scope: Agency Common

Command List:

```
LOGON UNIT -U $2
ASSIST UNIT -A $1 -U $2
LOGOFF UNIT -U $2
```

Command Parameters:

ID	Description	Required
\$1	UNIT	No
\$2	UNIT	No

Set Value

Source Value: Variable Name Parameter Destination: Variable Name

Dialog

Control ID: Row: Column: Control ID:

Cancel Macro Execution If Source Blank

Buttons: OK, Apply, Reset, Delete, Cancel, Print

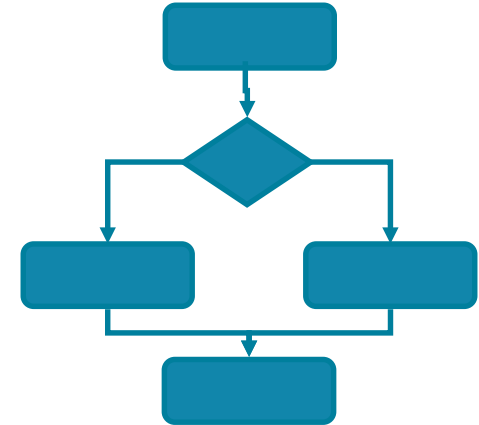
Parameter Description: ID: Parameter Description: Required Optional

Position	Configuration Name	Cmdkey	Cmdclass	Params	Keyins	description
1184	CAD	EMACRO	51	-	DU -\$1 -\$2 +N LOGGED_OFF_ASSIST	Assist a unit with a logged off unit

Workflow Foundation

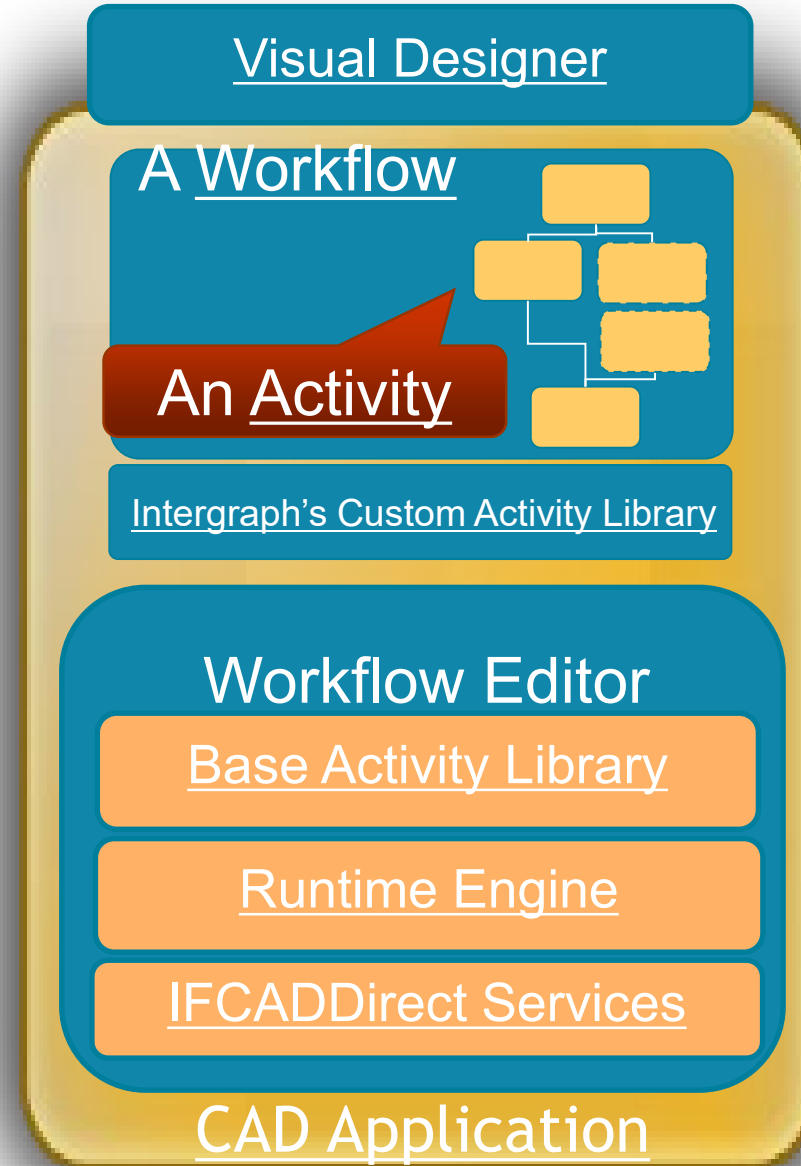
Workflow Foundation

- What is Workflow Foundation
 - Visualize steps
 - Predefined steps executed
 - A framework for building workflow
 - Built declaratively in xaml that can be executed as code
 - Defined workflows rather than building conventional codes

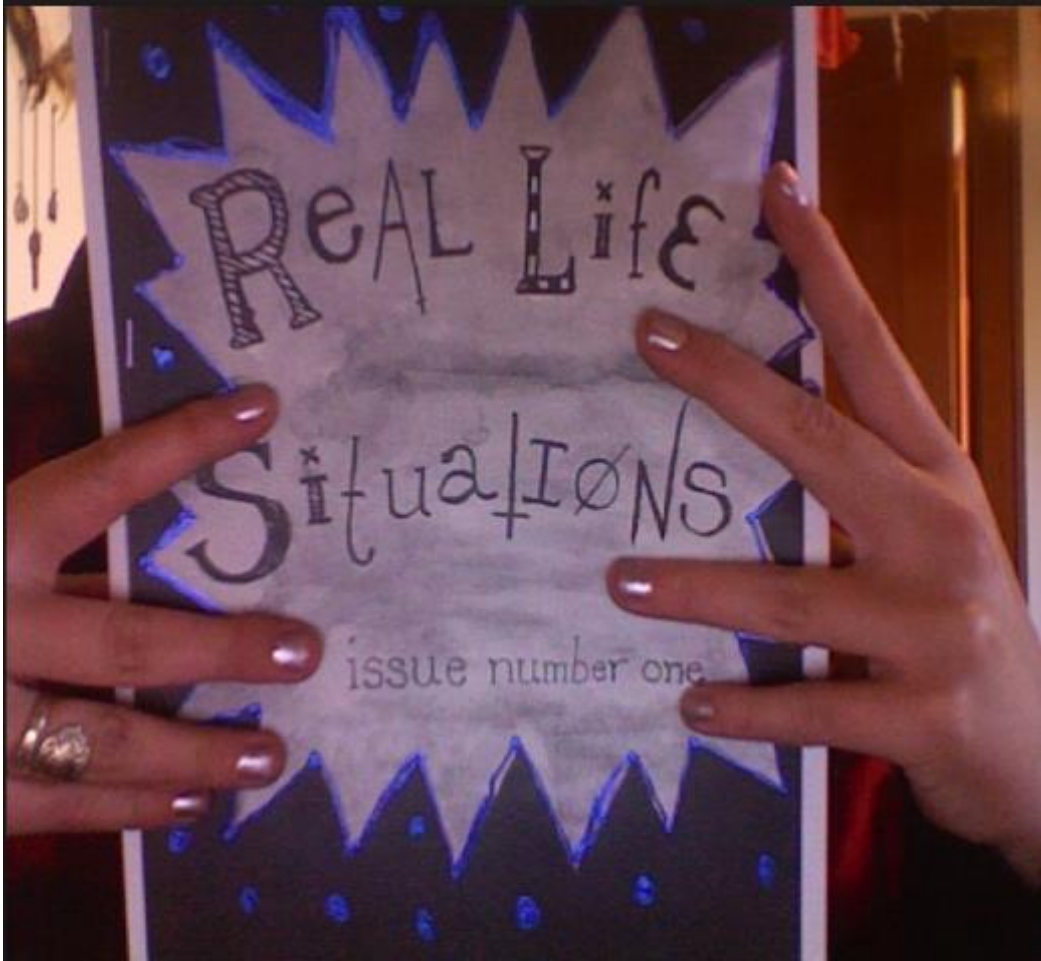


Workflow Architecture

- Architecture & Core
 - Key Concepts
 - Workflows are a set of activities
 - Components created for activities
 - Can have custom activity libraries

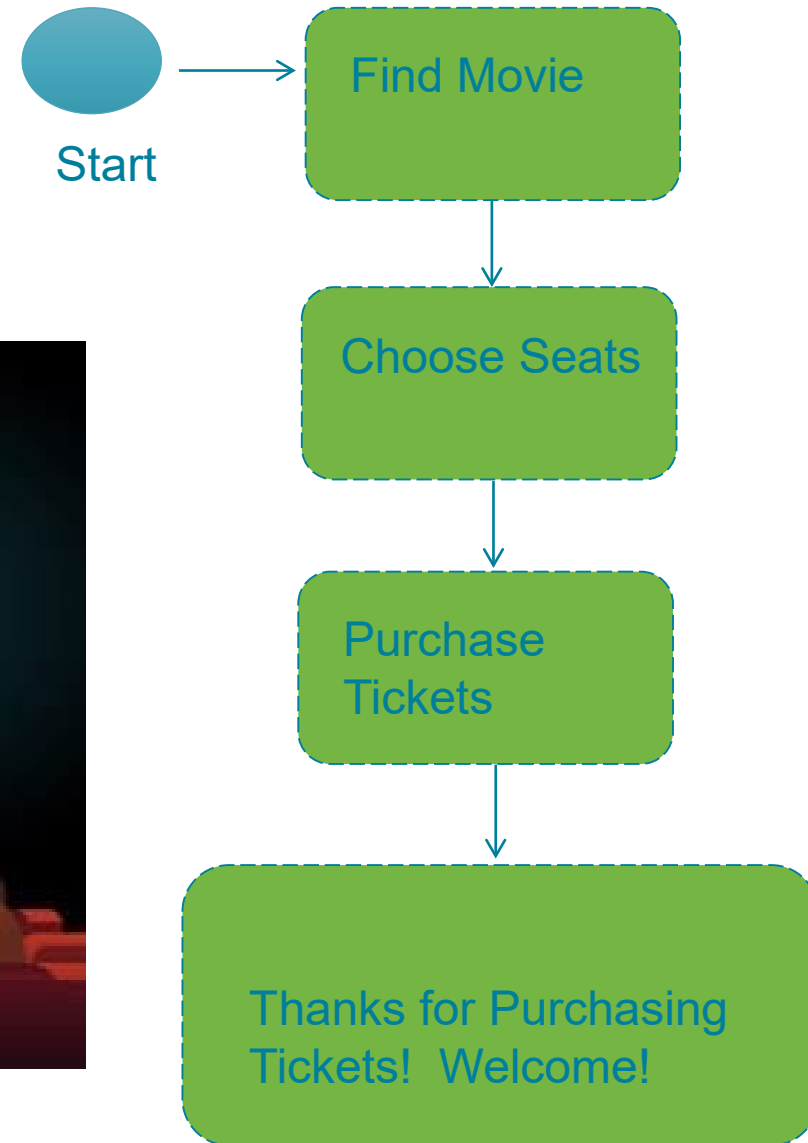
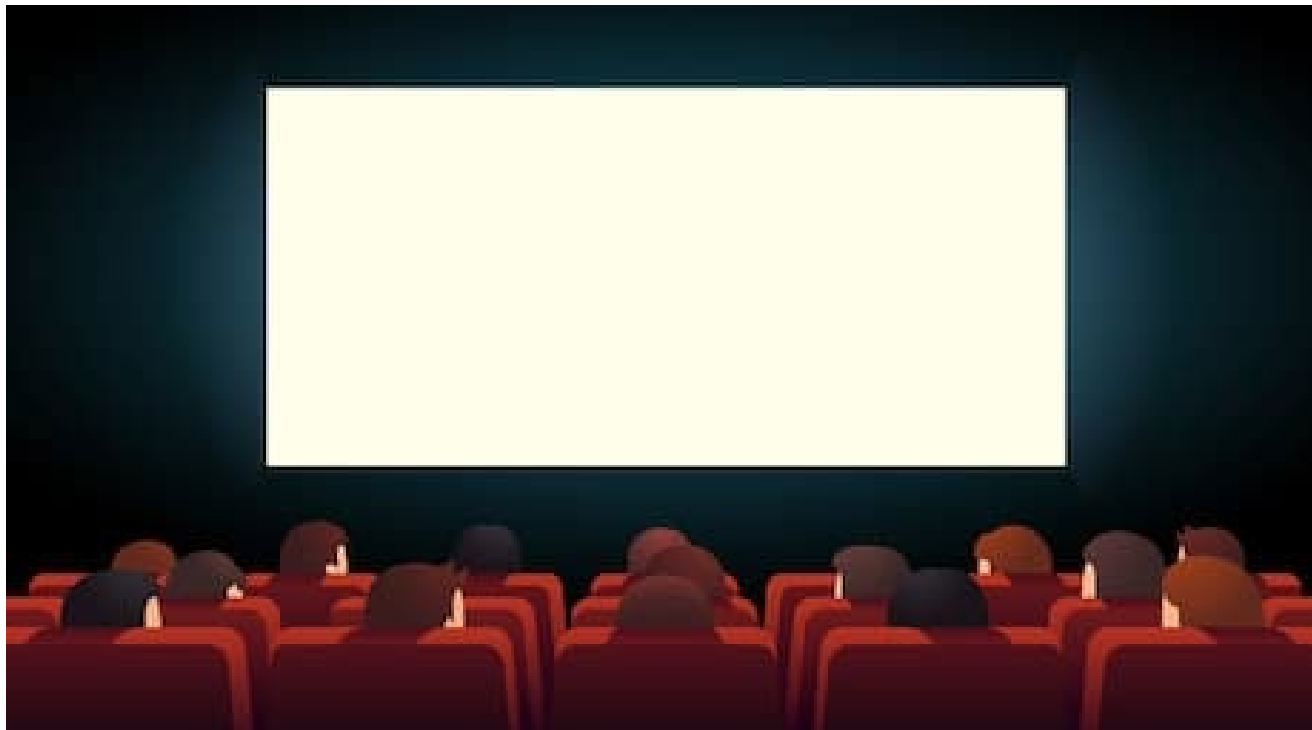


Workflow – Life Example



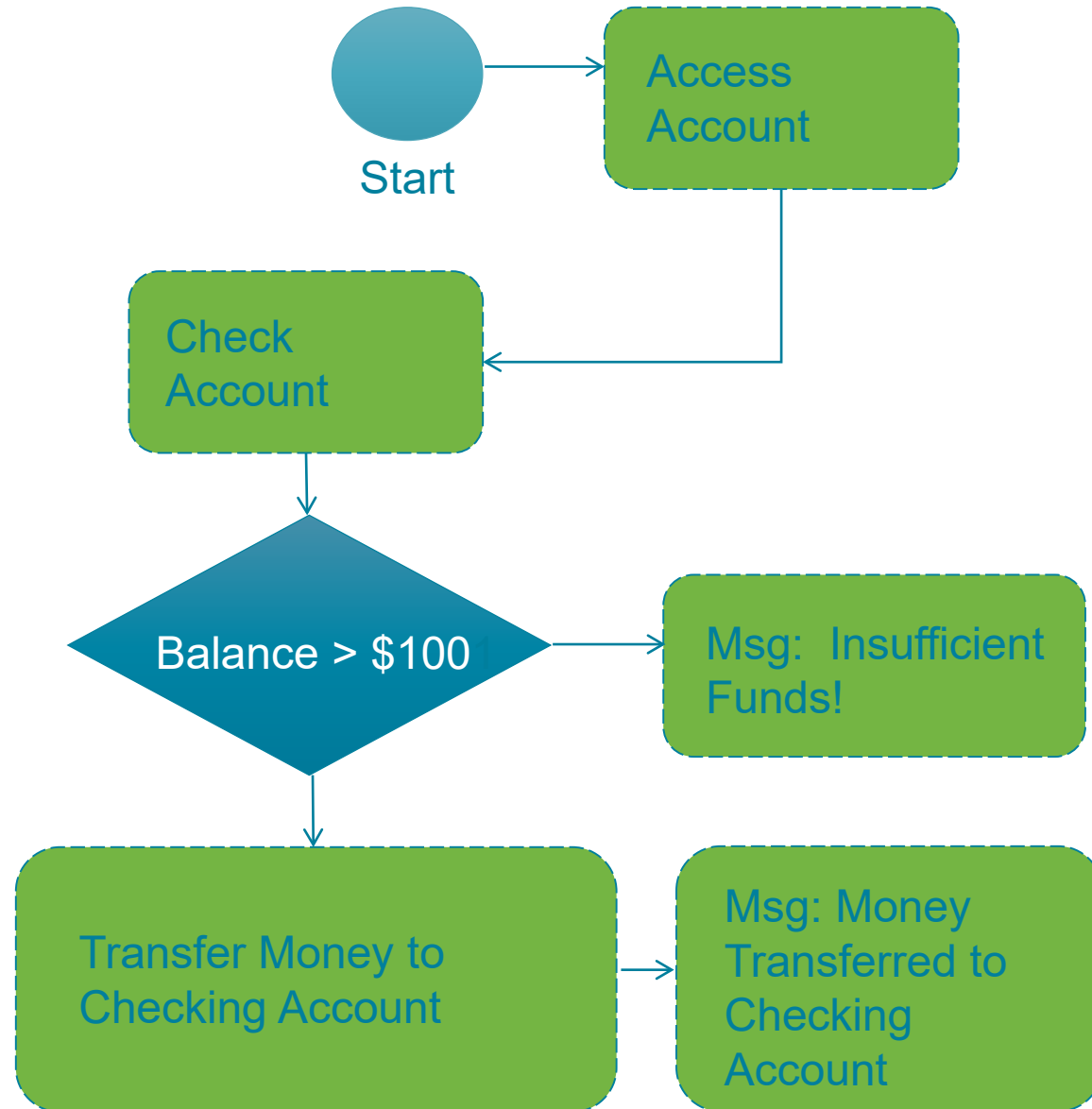
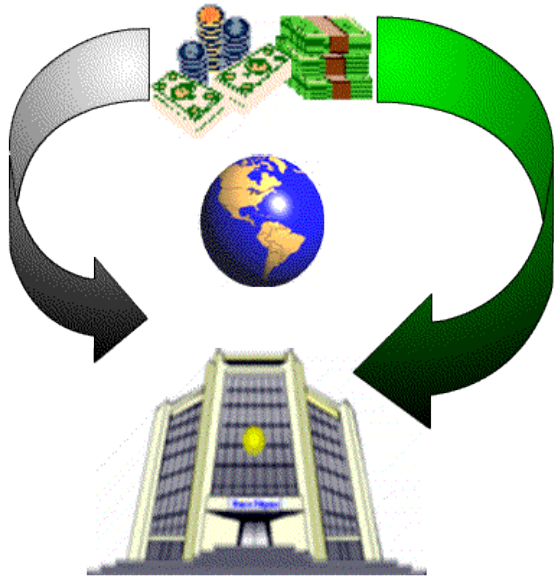
Workflow – Life Example

- Movies –M Joker -Seat 2 -C 555



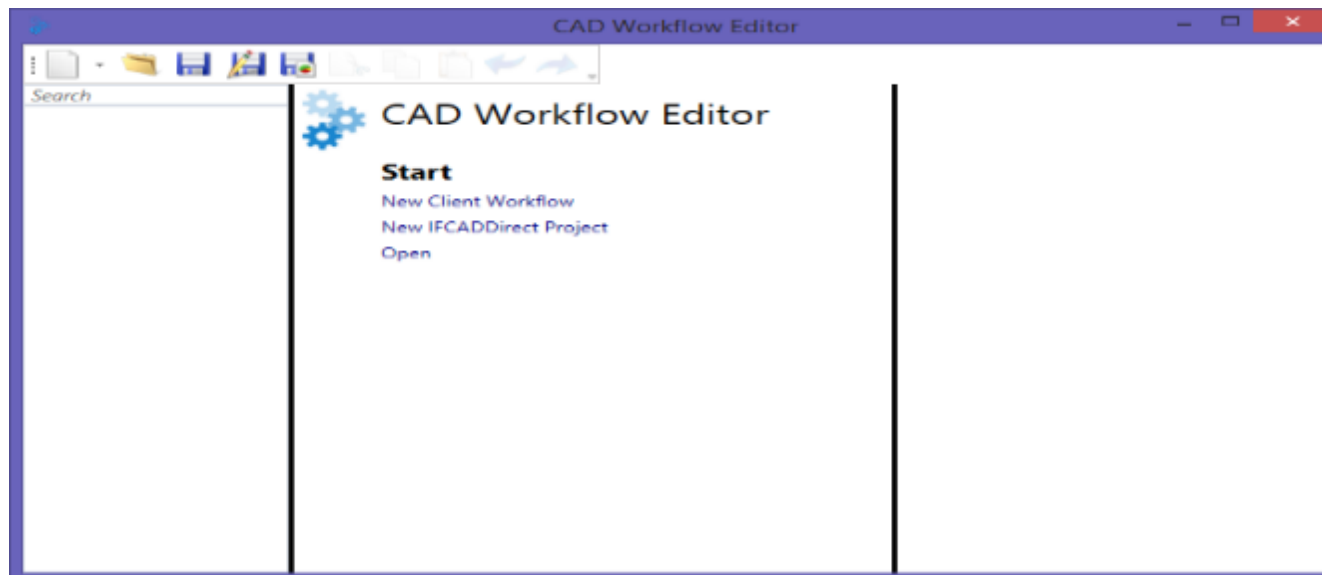
Workflow – Life Example

- BOA –A 555 -AM 100



Workflow Editor - CADDDBM

- CAD Workflow Editor
 - Introduced in 9.2 MR1
 - Allows flowchart logic with activities used to define actions
 - First used in I/Dispatcher as macro alternative
 - In 9.3 MR1, CWE supports IFCADDirect
 - Now in 9.4, CWE supports building custom UI



Workflow Editor – Client Workflow

- New Name – Client Workflow
 - For workflows used in I/Dispatcher and I/Calltaker
 - Macro alternative
- New Activities in 9.3
 - Available to client workflows
- New UI Commands in 9.4
 - Available to client workflows



The screenshot shows a software window titled "Add Prisoner" with a blue header bar. The window contains a form with the following fields and labels:

Last Name	<input type="text"/>
First Name	<input type="text"/>
Id	<input type="text"/>
Gender	<input type="text"/>
Race	<input type="text"/>
Height	<input type="text"/>
Weight	<input type="text"/>
Hair Color	<input type="text"/>
Eye Color	<input type="text"/>
Prison	<input type="text"/>
Incarceration Date	<input type="text"/>
Release Date	<input type="text"/>
Release Reason	<input type="text"/>

At the bottom right of the form is a button labeled "Add".

Client Workflow – Basic

- Basic

- Control Flows

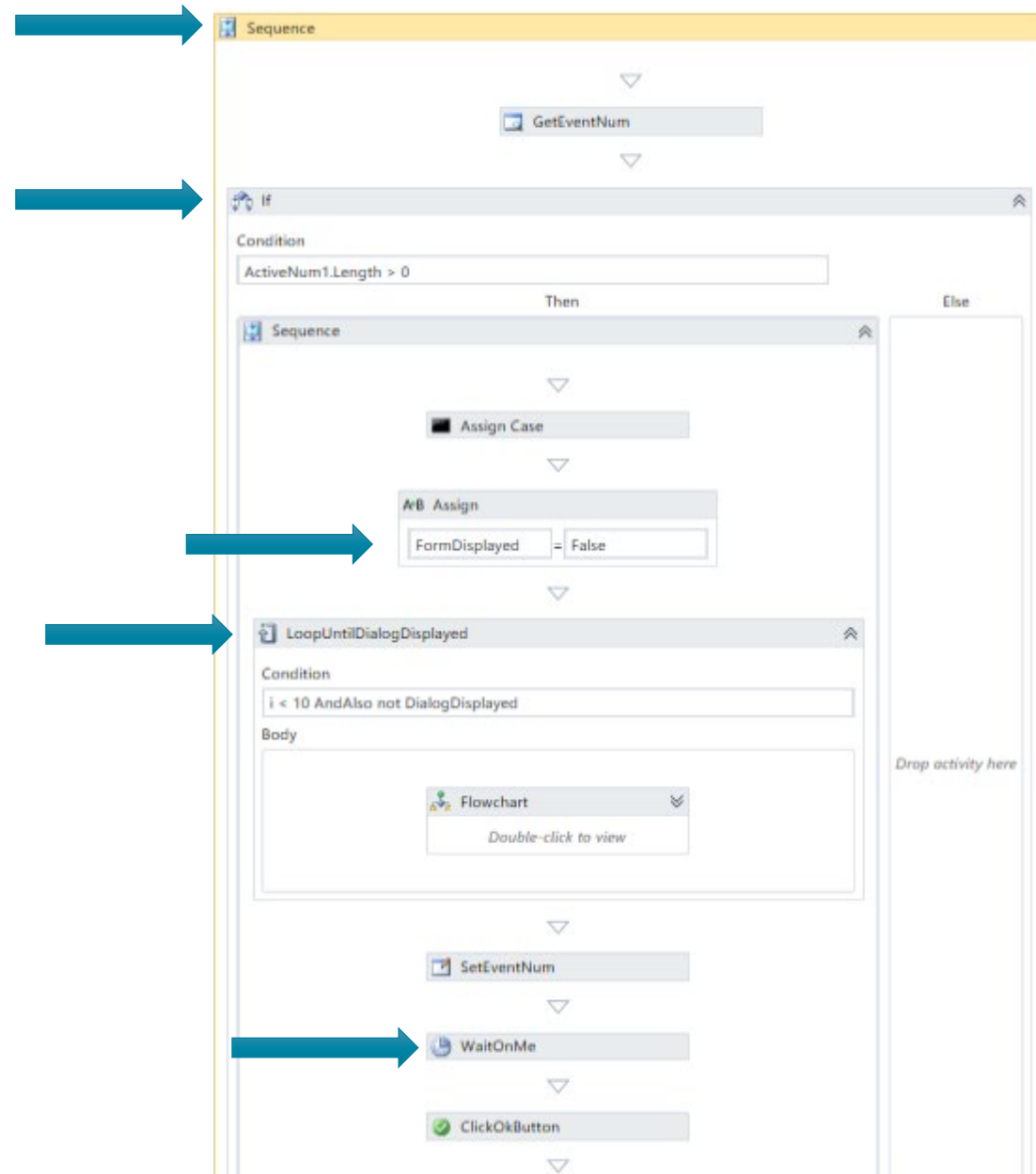
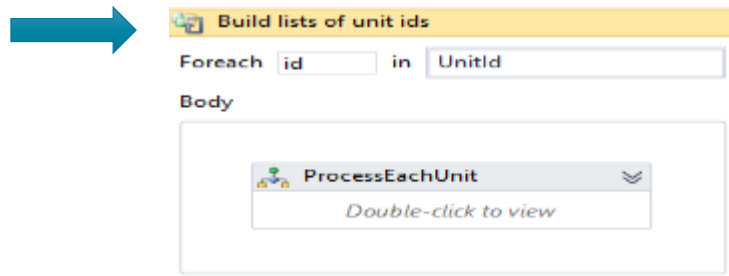
- Sequence
- If
- ForEach<>
- While

- Primitives

- A<=B Assign
- Delay

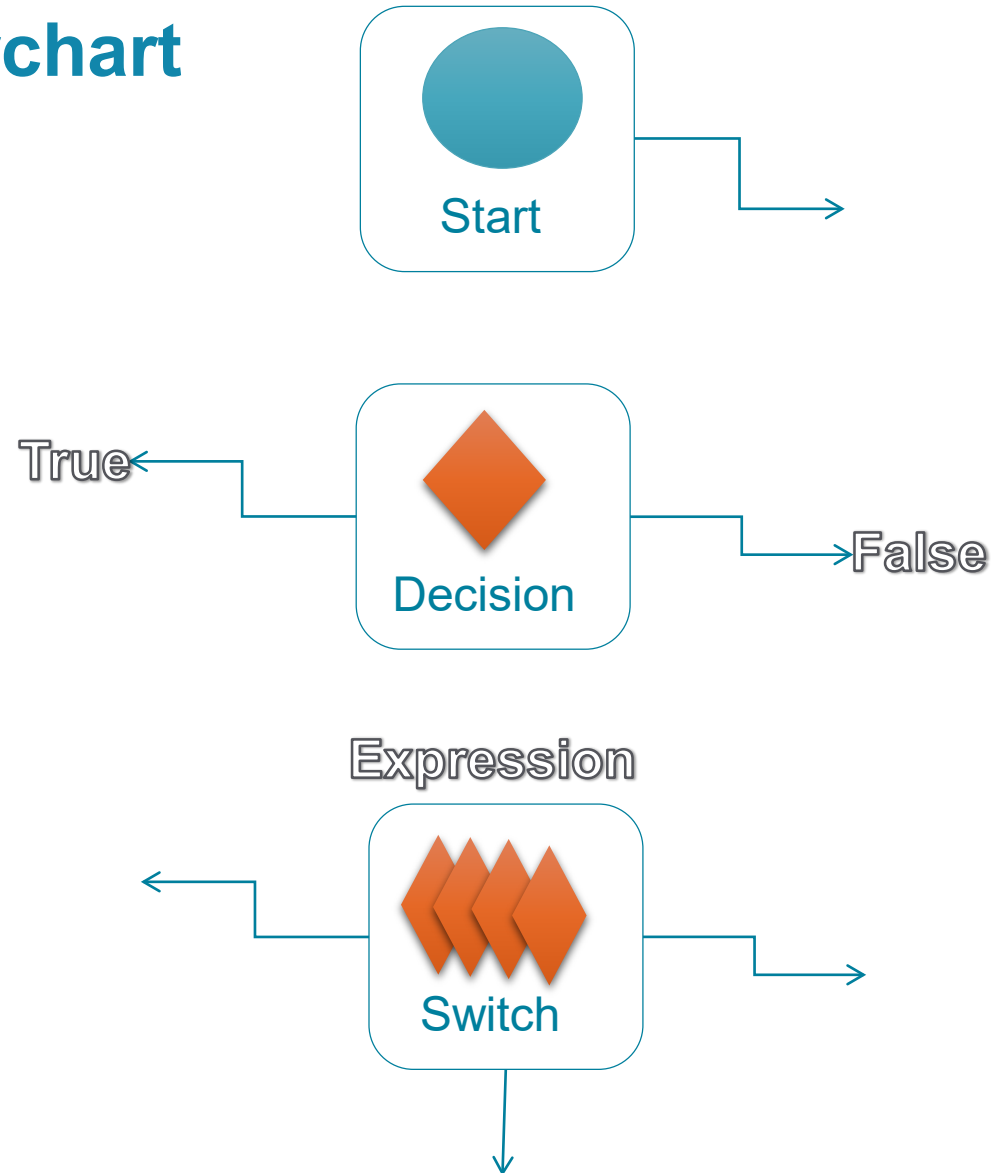
- Runtime Activities

- TerminateWorkflow



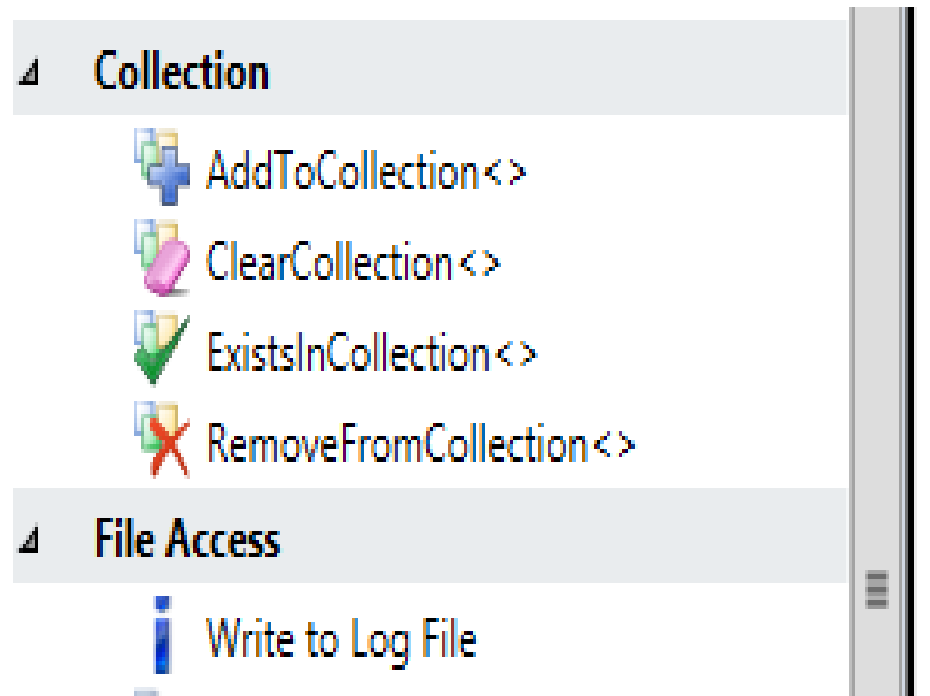
Client Workflow – Flowchart

- Flowchart
 - Flowchart
 - FlowDecision
 - FlowSwitch<>



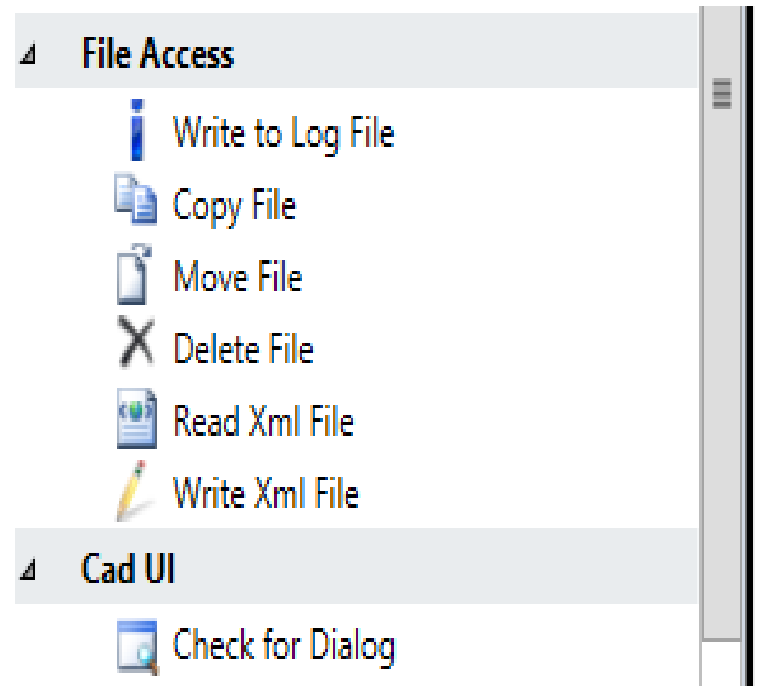
Client Workflow – Collection

- Collection



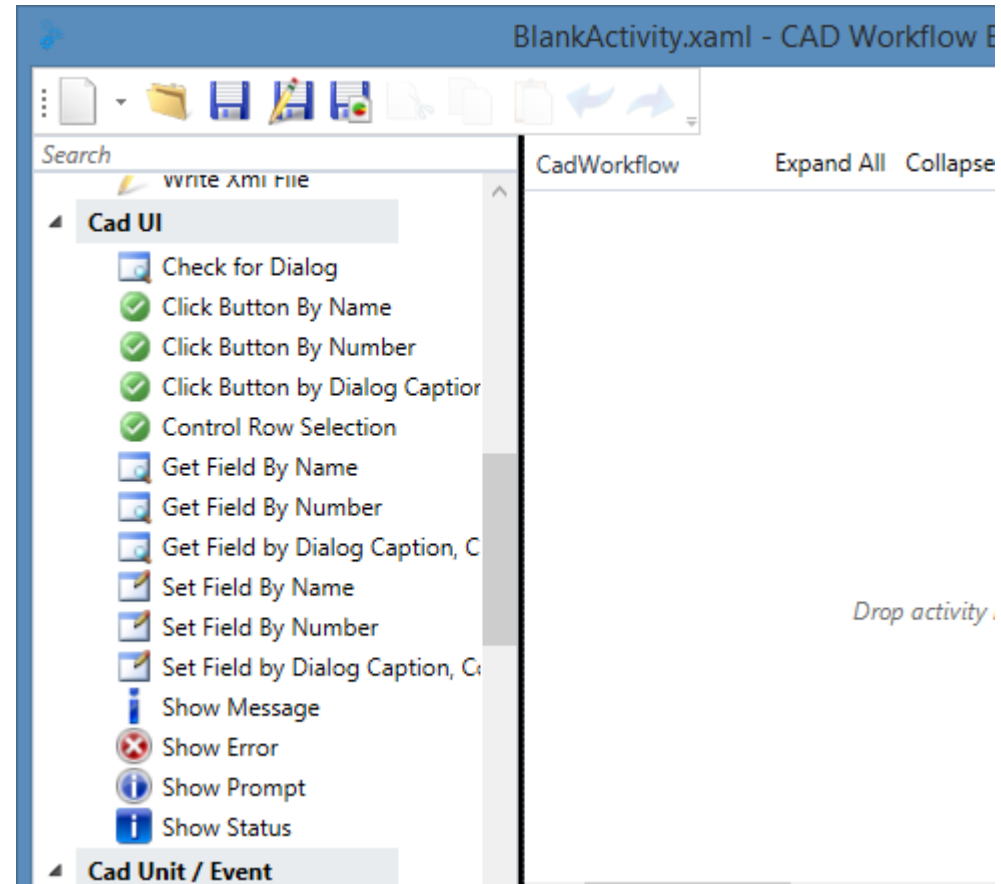
Client Workflow – File Access

- File Access



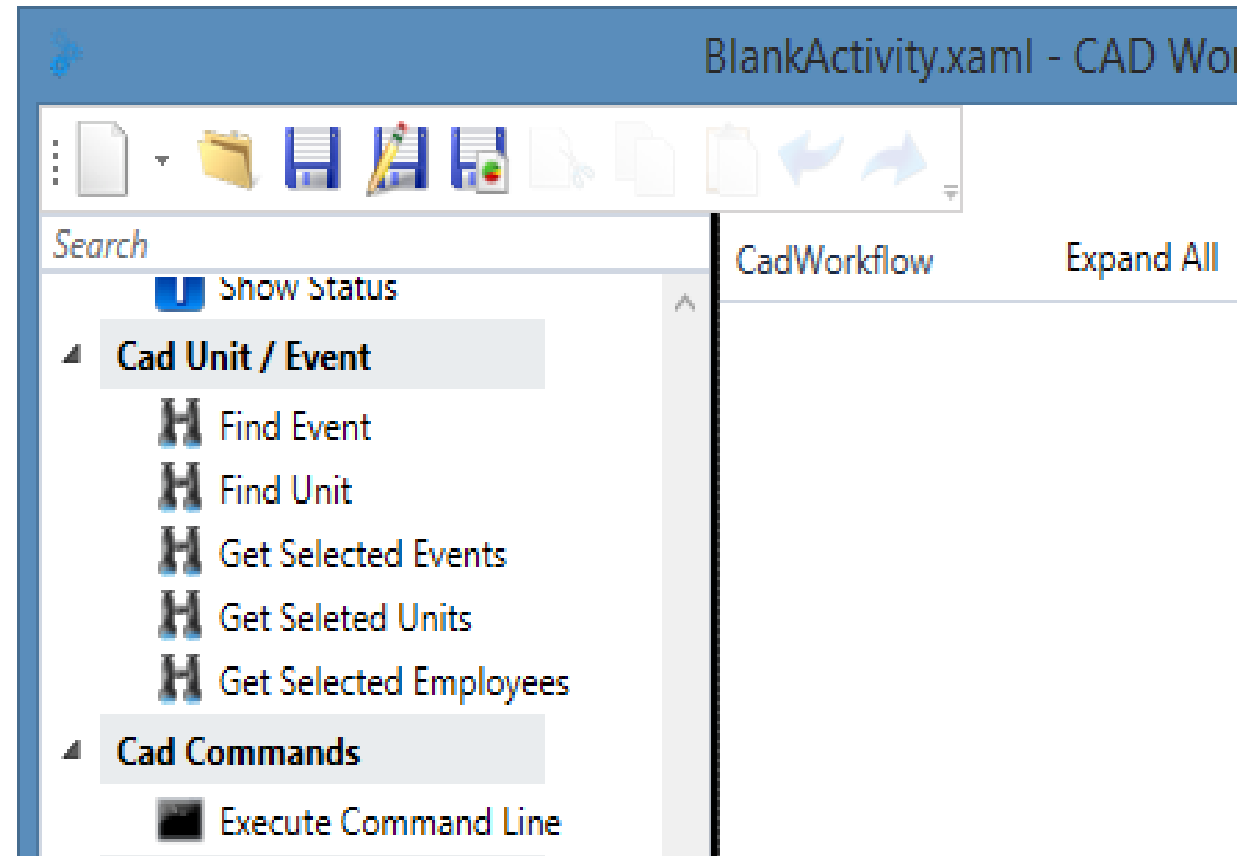
Client Workflow – CAD UI

- UI Automation
 - Click Button by Dialog Caption, Button ID
 - Get Field by Dialog Caption, Control ID
 - Set Field by Dialog Caption, Control ID



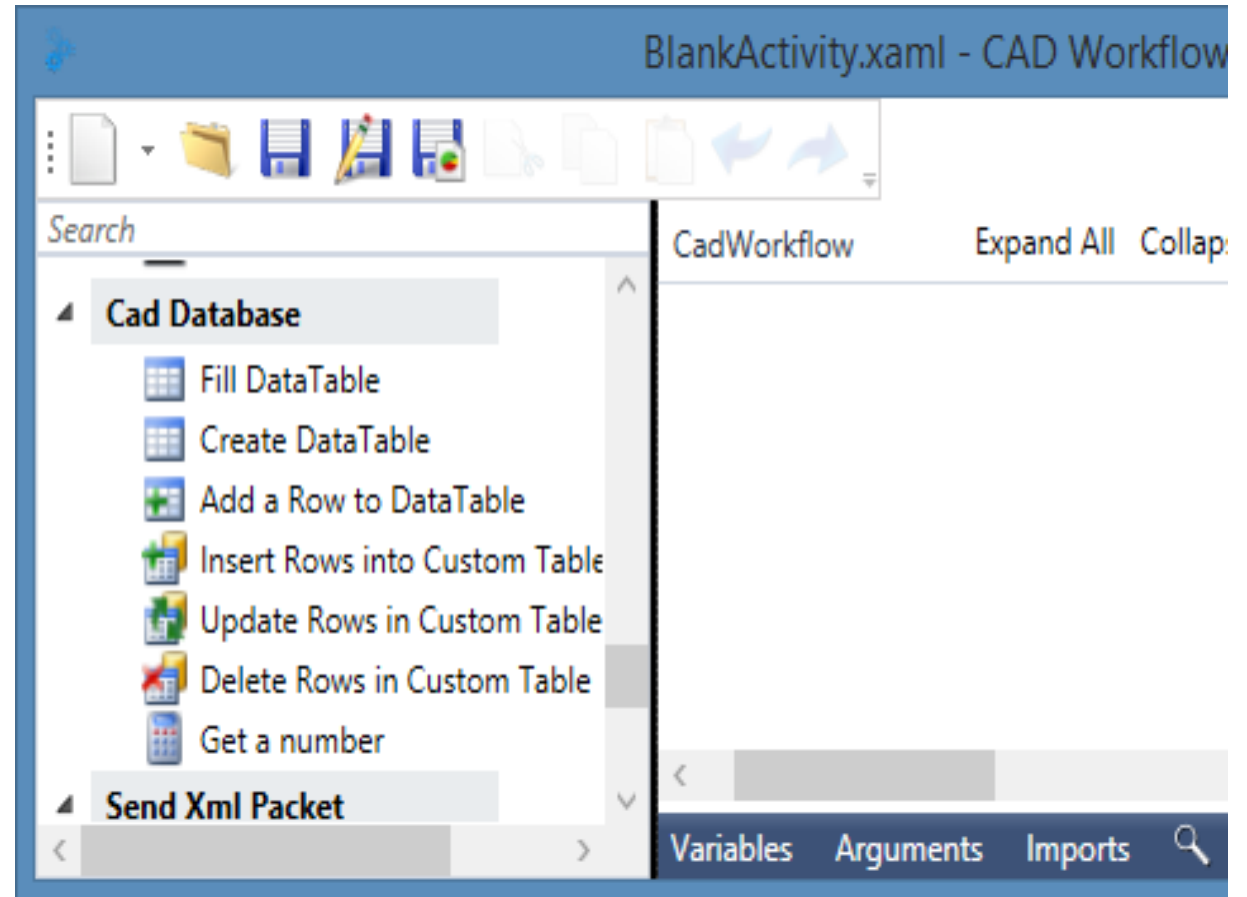
Client Workflow – Cache Access

- Cache Access
 - Get Selected Events
 - Get Selected Units
 - Get Selected Employees



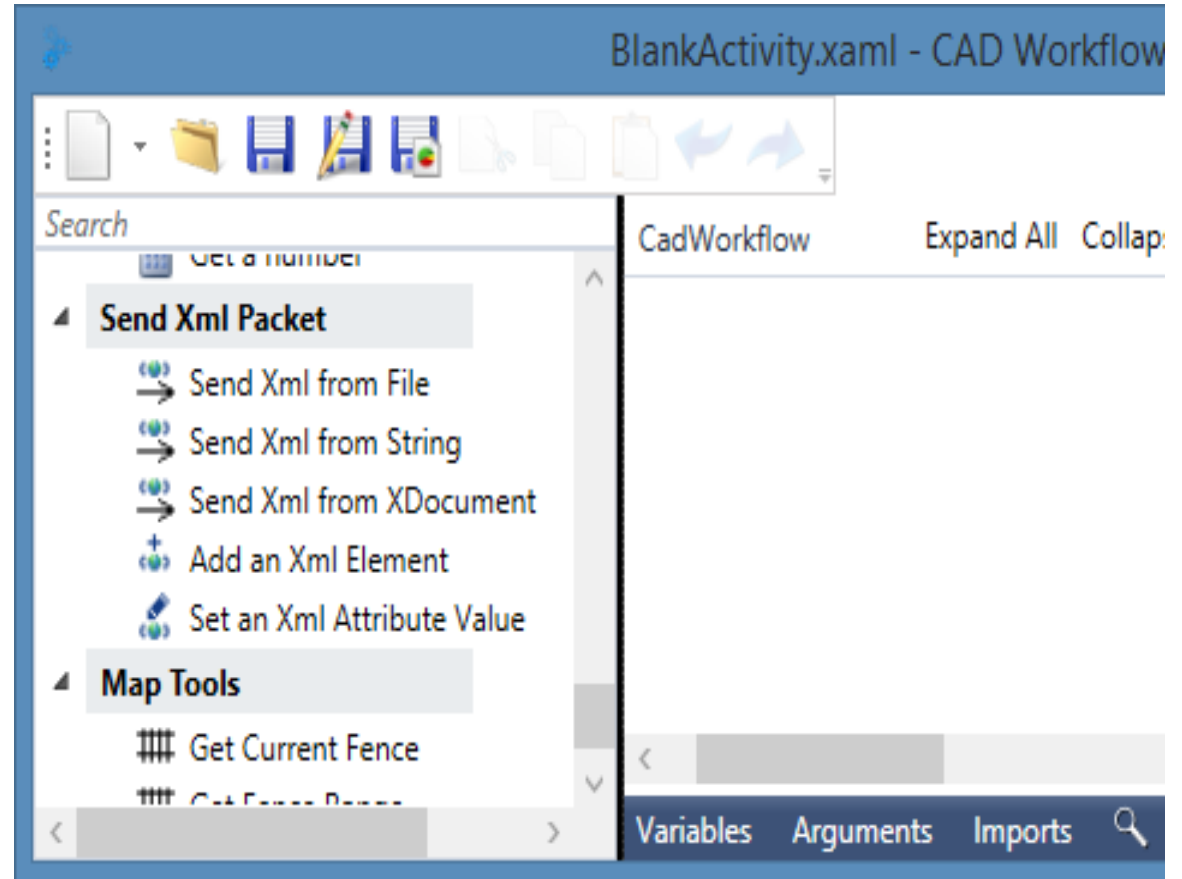
Client Workflow – Data Access

- Data Access
 - Create DataTable
 - Add a Row to DataTable
 - Insert Rows into Custom Table
 - Update Rows in Custom Table
 - Delete Rows in Custom Table



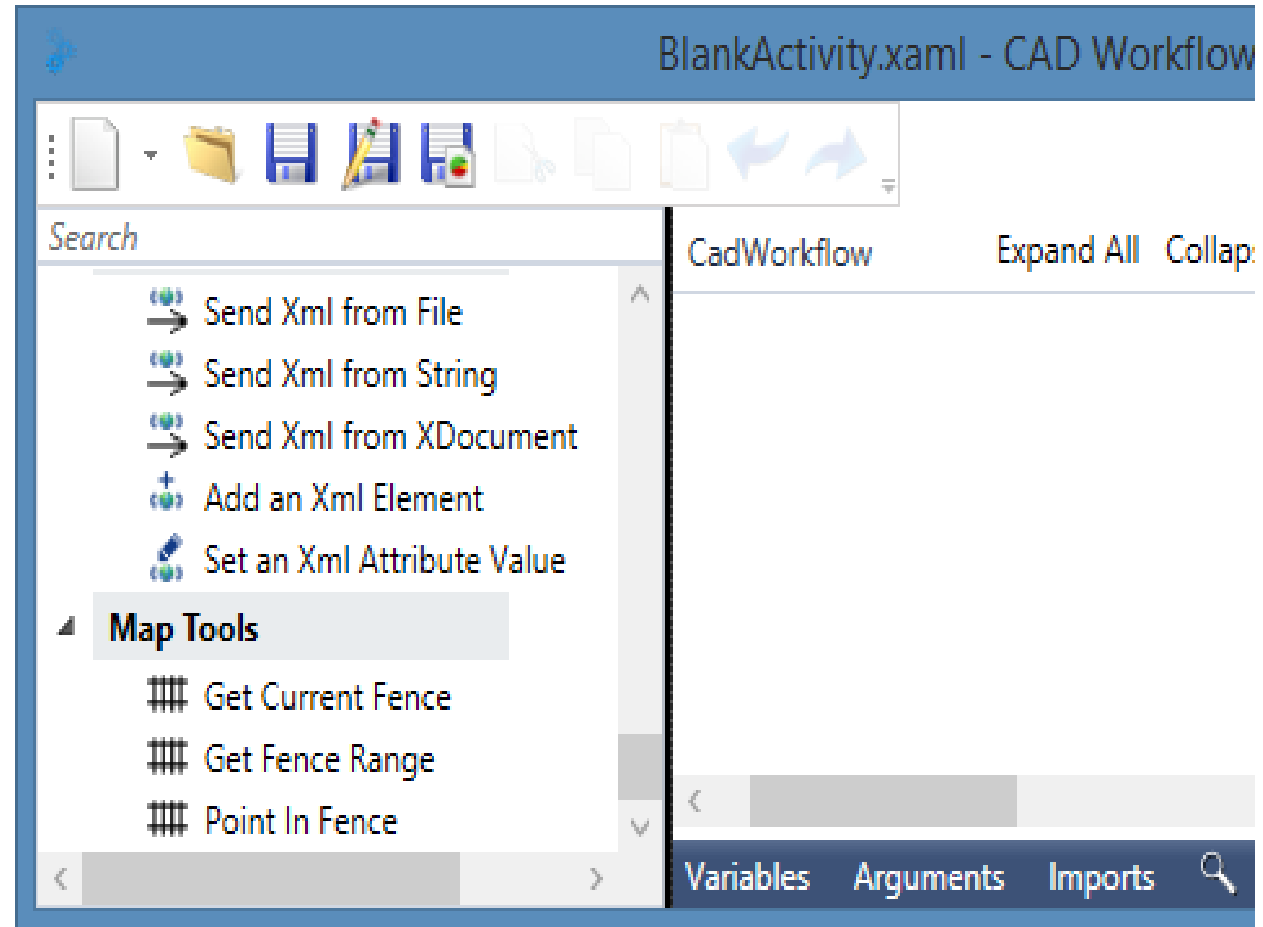
Client Workflow – XML

- XML Packets
 - Send Xml from File
 - Send Xml from String
 - Send Xml from XDocument
- XML Documents
 - Add an Xml Element
 - Set an Xml Attribute Value



Client Workflow - Map

- Map
 - Get Current Fence
 - Get Fence Range
 - Point In Fence



Client Workflow – Variables/Arguments/Expression

- Variables
 - Holds output/input value resulting from an activity
- Arguments
 - Used to create custom command line options
- Expression
 - Specify the execution of logic that an activity will perform

Name	Variable type	Scope	Default
localUnit	ILocalUnit	ProcessEachUnit	<i>Enter a VB expression</i>
localEvent	String	main	Nothing
dispatchUnitIds	String	main	""
logOffLocalUnits	List<ILocalUnit>	main	New List(Of ILocalUnit)
logOffUnitIds	String	main	""
notFoundUnits	String	main	""
<i>Create Variable</i>			

Variables Arguments Imports

Name	Direction	Argument type	Default value
UnitId	In	String[]	<i>Enter a VB expression</i>
<i>Create Argument</i>			

Variables Arguments Imports

Client Workflow Demo

Client Workflow Exercises

Custom UI for Client Workflows Introduction

UI components

- XAML – file to represent the custom UI in WPF. The WPF declares how the UI should look
- XML – file to reference the GUI template and query results
- Workflow XAML – file process the logic for querying and displaying the GUI
- Commands – commands to insert or retrieve GUI results

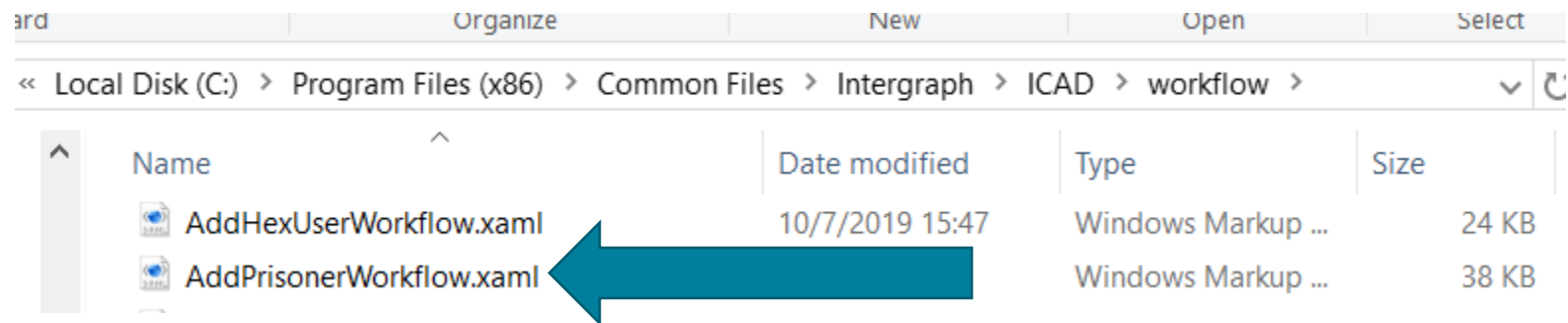
UI XAML

- The location for the GUI formatting xaml and template reference is
 - C:\Program Files (x86)\Common Files\Intergraph\ICAD\workflow\gui

Name	Date modified	Type	Size
CheckCoverSearch.xaml	1/12/2018 18:46	Windows Markup ...	2 KB
CheckCoverSearchResults.xaml	1/12/2018 16:44	Windows Markup ...	2 KB
CheckCoverSearchTemplate.xml	1/12/2018 16:38	XML Document	1 KB
DefineWordSearchTemplate.xml	10/5/2016 13:48	XML Document	1 KB
DefineWordSearch.xaml	10/5/2016 13:46	Windows Markup ...	3 KB
AddPrisoner.xaml	5/3/2016 03:51	Windows Markup ...	5 KB
AddPrisonerTemplate.xml	5/3/2016 03:51	XML Document	1 KB

UI Workflow

- The location for the GUI workflow xml is
 - C:\Program Files (x86)\Common Files\Intergraph\ICAD\workflow



ard Organize New Open Select

<< Local Disk (C:) > Program Files (x86) > Common Files > Intergraph > ICAD > workflow >

Name	Date modified	Type	Size
AddHexUserWorkflow.xml	10/7/2019 15:47	Windows Markup ...	24 KB
AddPrisonerWorkflow.xml		Windows Markup ...	38 KB

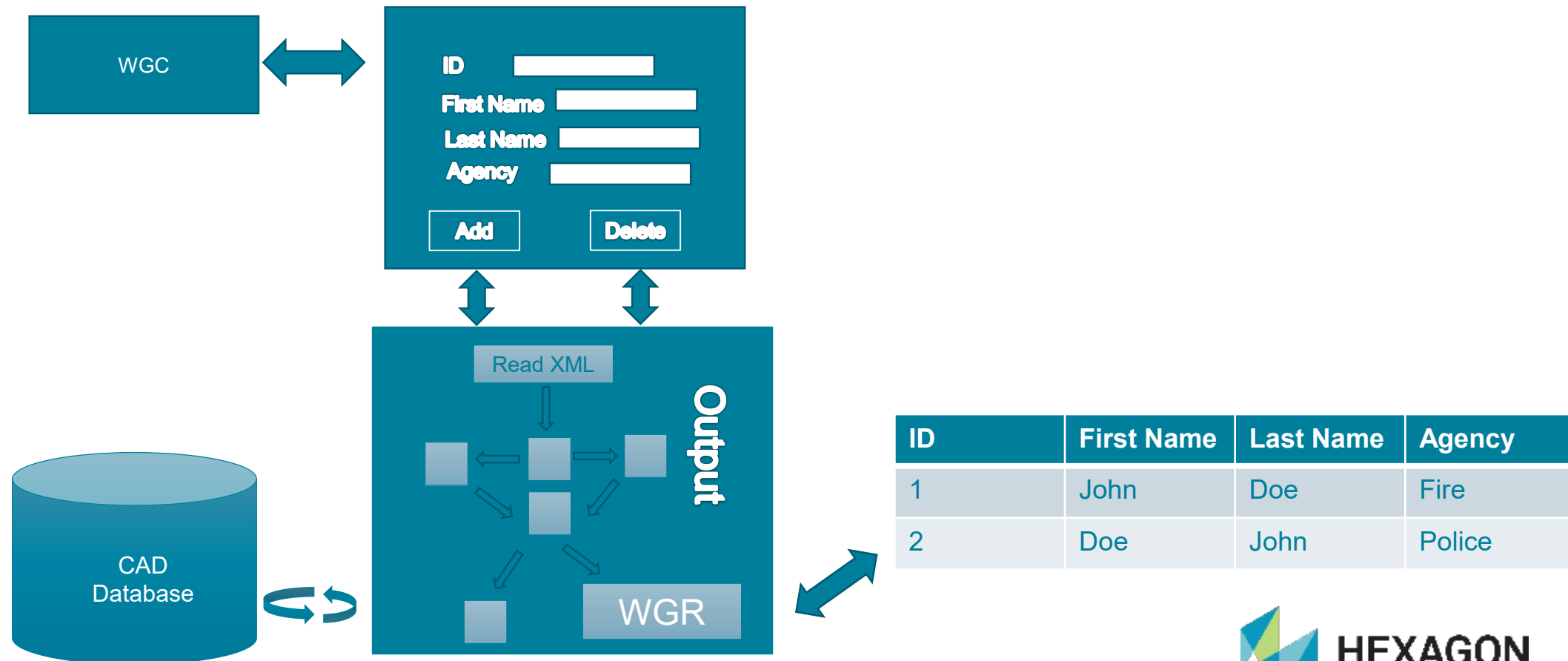
UI Commands

- There are two command lines in I/CAD that support custom UI:
 - Workflow GUI Report (WGR)
 - Command is intended strictly for displaying data in a report to the end user.
 - Workflow GUI Command (WGC)
 - Command supports displaying data, as well as running workflows in response to lose focus events and button clicks.

UI Commands – Continued

- WGR command format
 - WGR -F <file name> -H <Dialog Title to display> -R <full path to XML results file>
- WGC command format
 - WGC -F <file name> -D <full path to XML template file>" -H <Dialog Title to display>

Architecture for custom UI workflows



Custom UI for Client Workflows Demo

Custom UI for Client Workflows Exercise

Interoperability Framework For CAD

Implementation of Interoperability Framework

- “Interoperability Framework For CAD”
- Developed service-oriented interfaces to mechanisms within the I/CAD public safety system
 - “Command” execution
 - Data retrieval
 - Notification of changes to units, events, etc

IFCADDirect Workflows

- What is IFCADDirect?
 - It is a part of the Interoperability Framework
 - Runs as a service under ISM
 - Runs workflows in response to packets and other xml documents
 - These are called Routes
- Why IFCADDirect?
 - Needed server based workflows
 - IFCADDirect supports workflows and has the required activities

IFCADDirect Workflow Projects

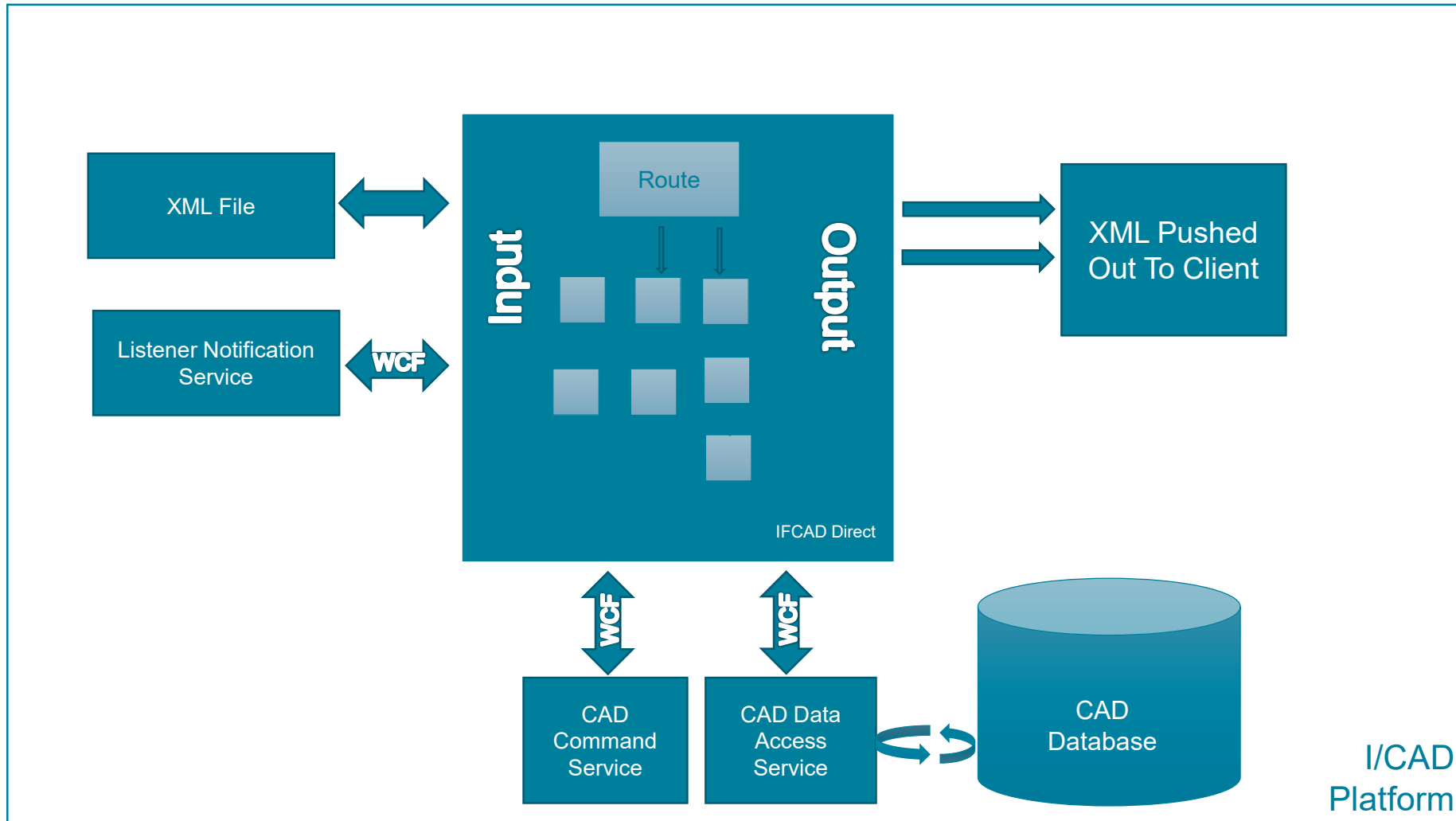
Workflow Editor – IFCADDirect Project

- New extensive set of activities focused on IFCADDirect
- Report types that support report based activities
- Workflow responds to packets and xml documents
- Builds to dll in support of the IFCADDirect design
 - Found in project output directory
 - Drop dll in route folder under IFCADDirect installation
- Documented in CADDDBM Help

Workflow Editor – IFCADDirect Activities

The screenshot displays the 'CAD Workflow Editor' window titled 'StartStopTracking.xifml'. The interface includes a search bar at the top left, a toolbar with standard file operations, and a left-hand navigation pane. The navigation pane is expanded to the 'IFCAD' category, listing various activities such as 'Acknowledge Unit', 'Add Event Comments', and 'Check Row Exists'. The main workspace shows a workflow diagram for 'Track Units'. The diagram starts with an 'Enabled' start node, followed by a 'Check Row Exists' activity. This leads to a yellow diamond-shaped 'Decision' node. From the decision node, two paths emerge: 'Need Update' and 'Need Insert'. The right-hand pane shows the 'System.Activities.ActivityBuilder' with a tree view containing 'Project StartStopTracking' and 'StartStopTracking.xifml'.

Architecture for customer-developed workflows



I/CAD
Platform



HEXAGON
SAFETY & INFRASTRUCTURE

How to check packet structure

- Boost the logging for NotifyLevel4 to All in IFCADDirect.exe.config
- View packet detail IFCADDirect.html log

```
<?xml version="1.0"?>
<CadEventNew xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://schemas.datacontract.org/2004/07/Intergraph.IPS.PacketTypes">
  <Header>
    <AckRequest>1</AckRequest>
    <Destination>call/disp</Destination>
    <DestinationProcessId>0</DestinationProcessId>
    <DestinationType>3</DestinationType>
    <Filter>Police,METRO</Filter>
    <MessageNumber>604</MessageNumber>
    <MessageType>3</MessageType>
    <PacketType>1</PacketType>
    <Sender>svr16sq16dk</Sender>
    <SourceProcessId>5432</SourceProcessId>
    <SourceType>0</SourceType>
  </Header>
  <NetworkEvent>
    <AERevNum>1</AERevNum>
    <AddTime>1562277837</AddTime>
    <Agency>Police</Agency>
    <AgencyEventId>P1900003</AgencyEventId>
    <Alarm>false</Alarm>
    <AppointmentAlarm>false</AppointmentAlarm>
    <AppointmentAlarmSnooze/>
    <AppointmentEndTime/>
    <AppointmentStartTime/>
    <Arrived>false</Arrived>
    <AssignedCaseState>0</AssignedCaseState>
    <Beat>4</Beat>
    <CallbackRepeatInterval>0</CallbackRepeatInterval>
    <CallbackTime/>
    <CancelRequest>false</CancelRequest>
    <CaseNumberId>4</CaseNumberId>
    <ClearAlarm>15</ClearAlarm>
    <CommonEventId>4235</CommonEventId>
    <CreationTerminal>floyd</CreationTerminal>
    <DispatchAssignedUnitId/>
    <DispatchGroup>METRO</DispatchGroup>
    <Display>true</Display>
    <DisplayClosedOnMonitor>true</DisplayClosedOnMonitor>
    <DispositionCodeFlag>false</DispositionCodeFlag>
    <DispositionCodeRequired>false</DispositionCodeRequired>
    <DueTime/>
    <Enroute>false</Enroute>
    <EnrouteAlarm>2</EnrouteAlarm>
    <EtaFlag>false</EtaFlag>
    <EventAlarm>2</EventAlarm>
  </NetworkEvent>
</CadEventNew>
```

IFCADDirect Workflow Demo

Workflow Editor – IFCADDirect Project Demo

- Demo
 - Watch for unit arrive (CadUnitOnScene)
 - Get event report
 - Send message to creating calltaker or dispatcher

IFCADDirect Workflow Exercise

IFCADDirect or Client Workflows

- When does the workflow run?
 - IFCADDirect is a server process triggered by a route which is often a listener packet
 - Client Workflow is run manually through CAD command line
- What can it run?
 - IFCADDirect has activities that use CadDataService and CadCommandService to perform actions
 - Client Workflow has activities that use forms, caches, command lines, direct db access, packets, and the map to perform actions
- Why use one over the other?
 - IFCADDirect provides full system automation through packets
 - Client Workflows extends the capabilities of a CAD workstation

Thank You