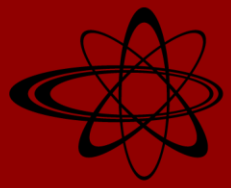

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ENHANCEMENT AND RE-IMPLEMENTATION OF THE INETVIS VISUALISATION TOOL

By: Christopher Schwagele
Supervisor: Mr Barry Irwin

Telkom
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PRESENTATION OUTLINE

Presentation Outline

1. Background

- Definitions
- InetVis Visualisation Tool
- Project Objectives

2. Main Differences

- Underlying Model

3. dotNetVis Server

- Packet Processing

4. dotNetVis Client

- Structure
- Visualisation

5. dotNetVis Communication

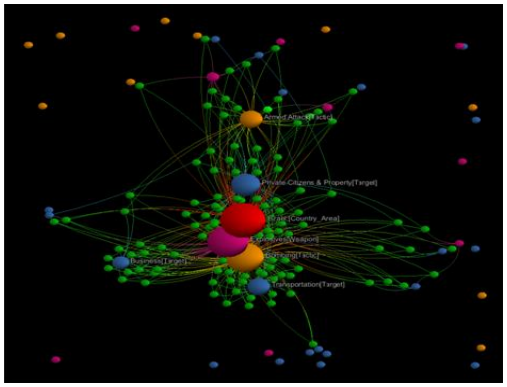
- Protocol
- Library
- API

6. Extensions

1. BACKGROUND

Definitions

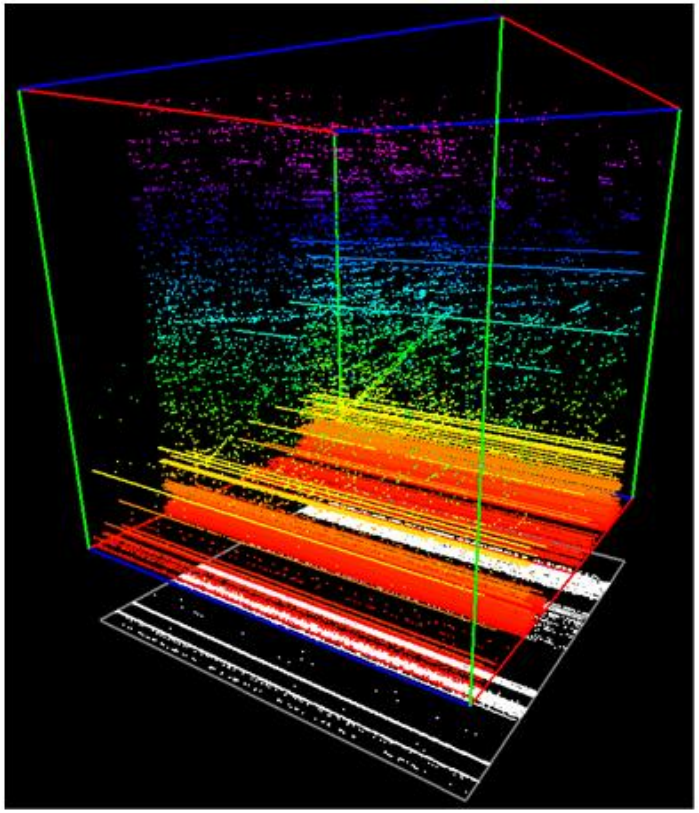
- Data Visualisation
  - Purpose
  - Process

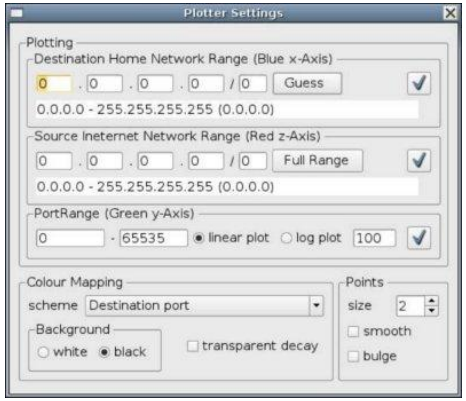


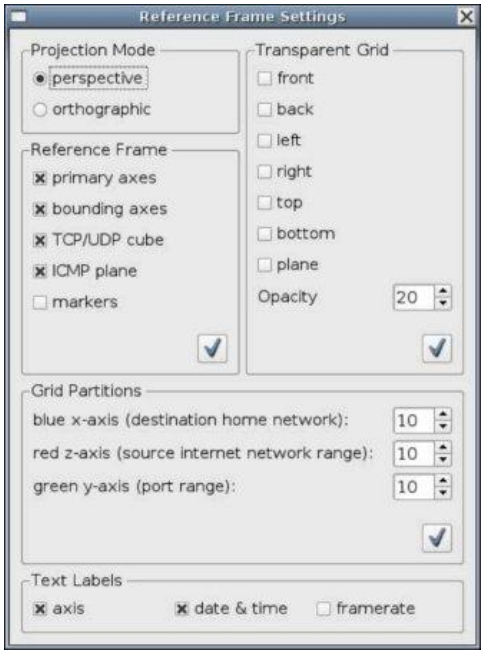
- Network Telescope
  - Purpose
  - Output

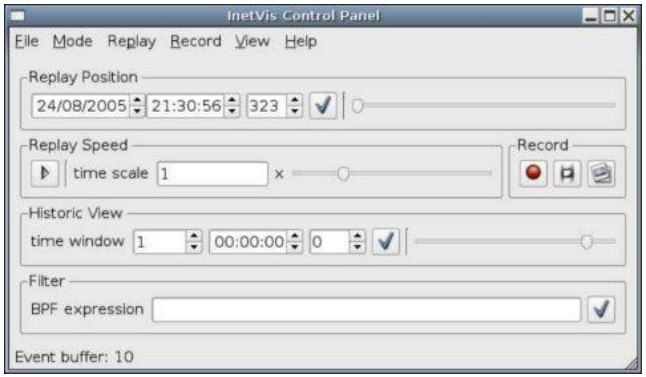
InetVis Visualisation Tool

- Master's Project – J.P. van Riel
- Underlying Architecture
- Packet Capture - libpcap
- Rendering – OpenGL
- Performance









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Project Objectives

- Problem Statement
- InetVis short-fallings
- Proposed Enhancements
  - Separating the components
  - Exploiting parallel processing
  - Enhancing the GUI
  - Immersive packet navigation
- Porting the system
  - dotNetVis

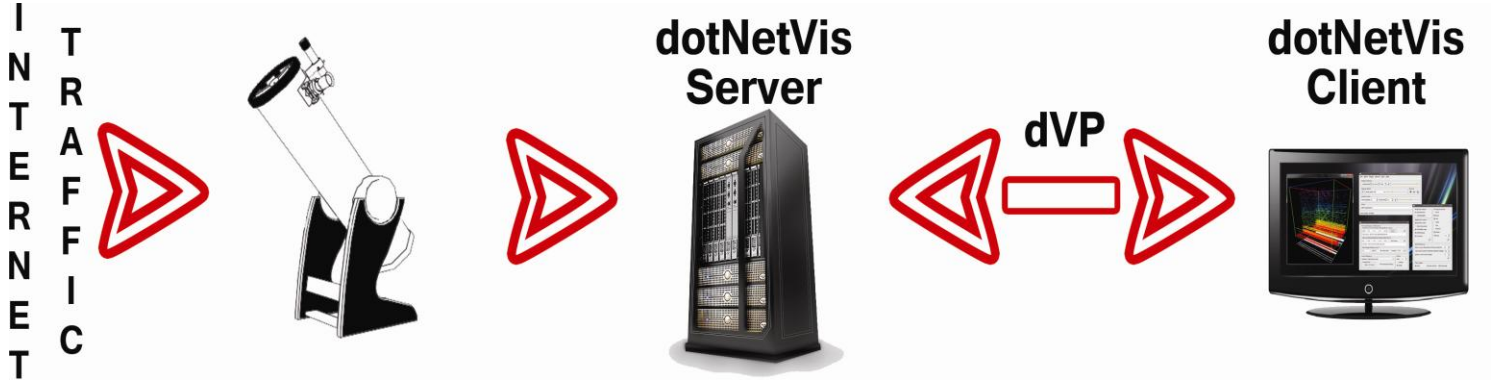
2. MAIN DIFFERENCES

Development

- Environment
  - .NET vs. C++
  - XNA, openGL, openTK??

Underlying Model

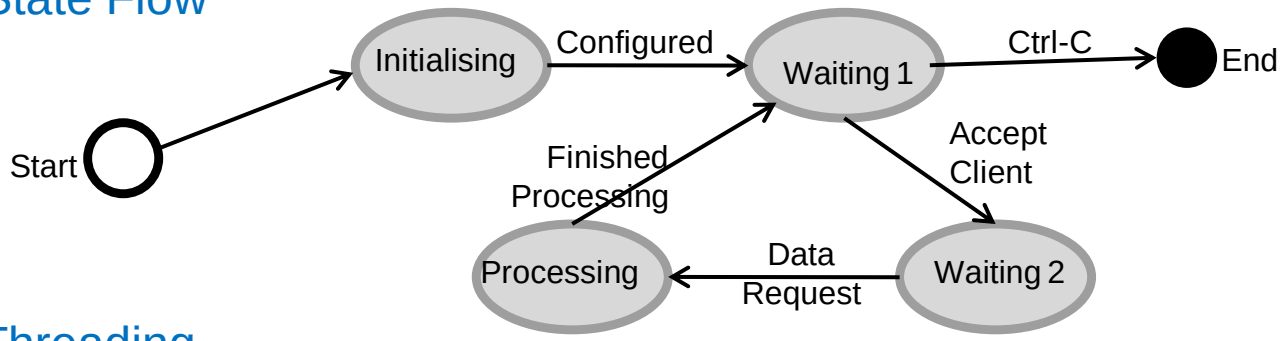
- **Client Server Model**
  - Modularization
    - Processing
    - Memory
  - Flexibility
    - Future Implementations
    - Generic Communication – dotNetVis Protocol (dVP)



3. DOTNETVIS SERVER

Structure

- Main Program
- Packet Processing Component
  - SharpPcap
- Communication Component
  - dVP (dotNetVis Protocol)
- State Flow



- Threading

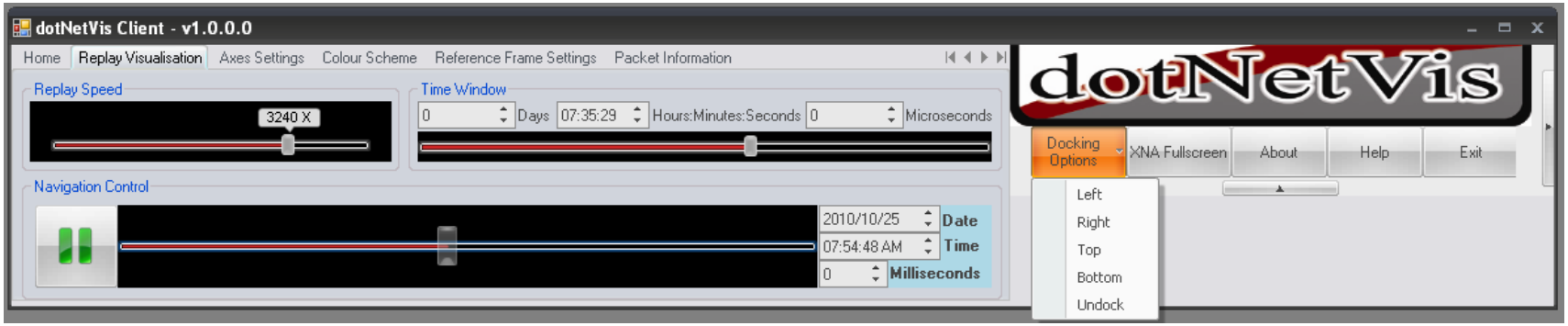
Packet Capture

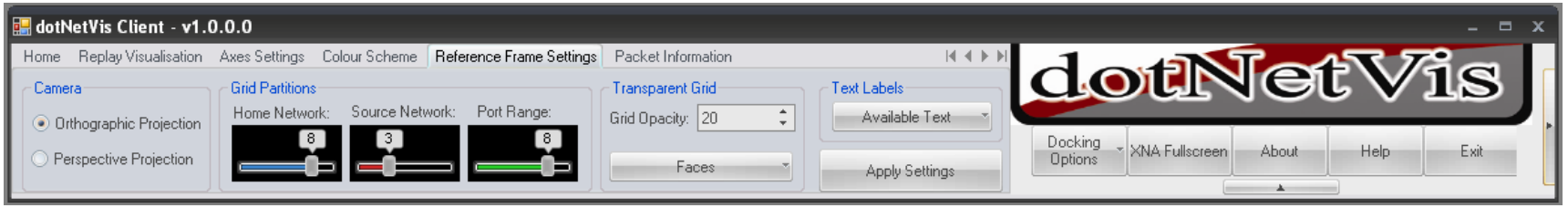
- Capture Device Selection
- Capturing packets from a Device
- Processing Packets
- Processing Termination

3. DOTNETVIS CLIENT

Structure

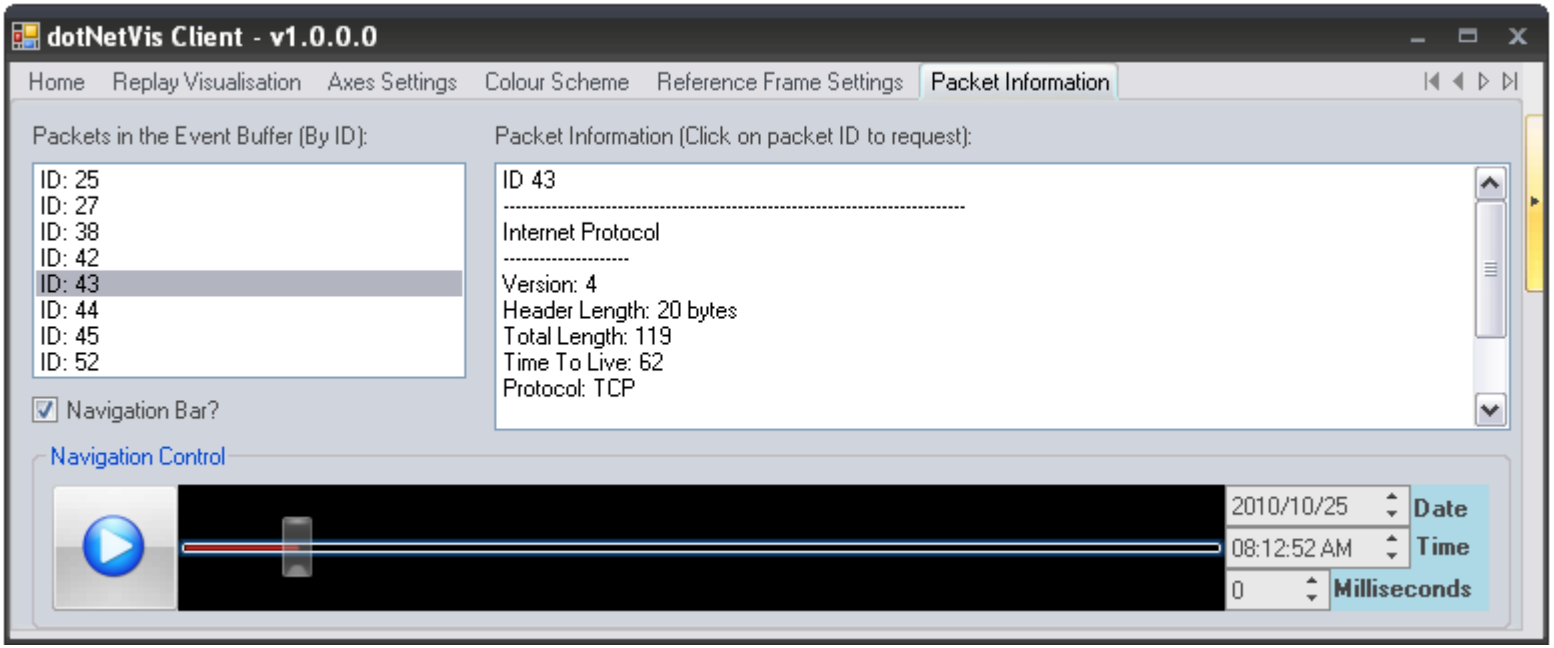
- Component Manager
  - Threading
- Visualisation Component
  - XNA and WinForms: Relationship Issues… (Can't escape them!)
  - Solution?
  - Implementation
- Settings Component



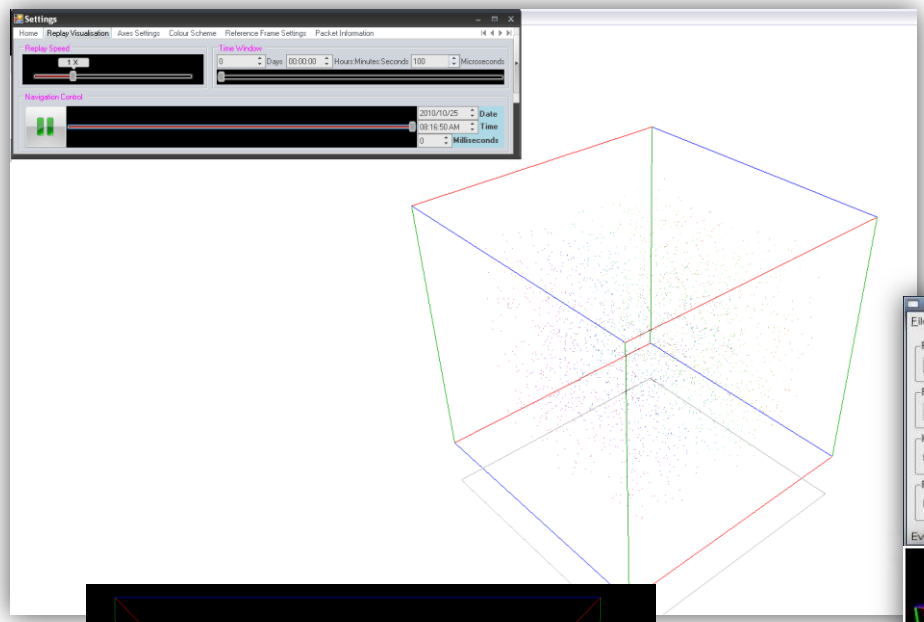


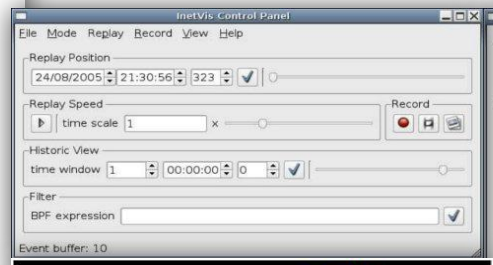
Settings (contd.)

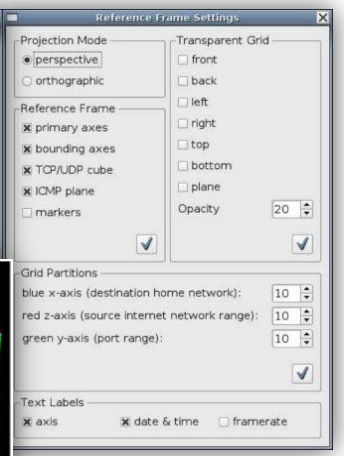
- Changing settings
- Packet Selection
  - Cube point highlighting
  - Packet Information

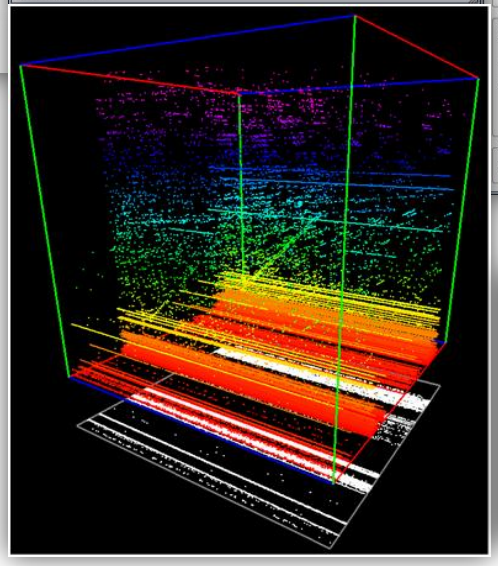


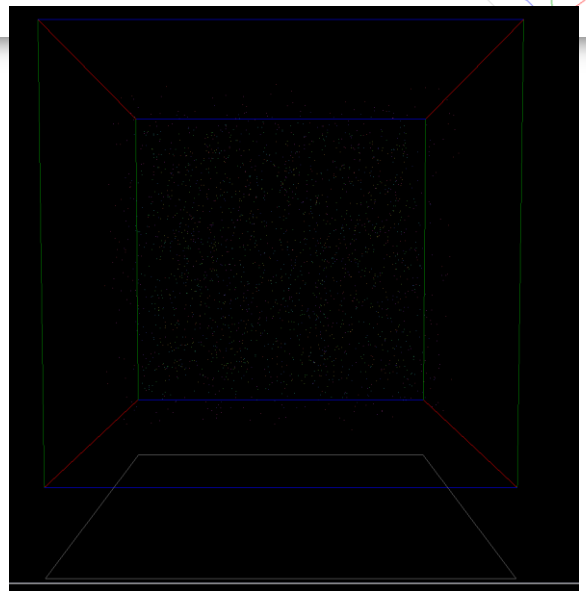
Comparison of screen consumption

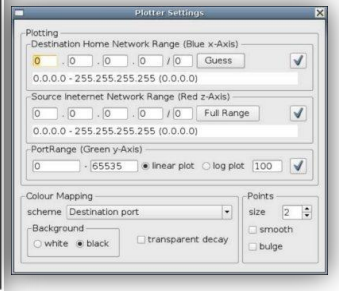










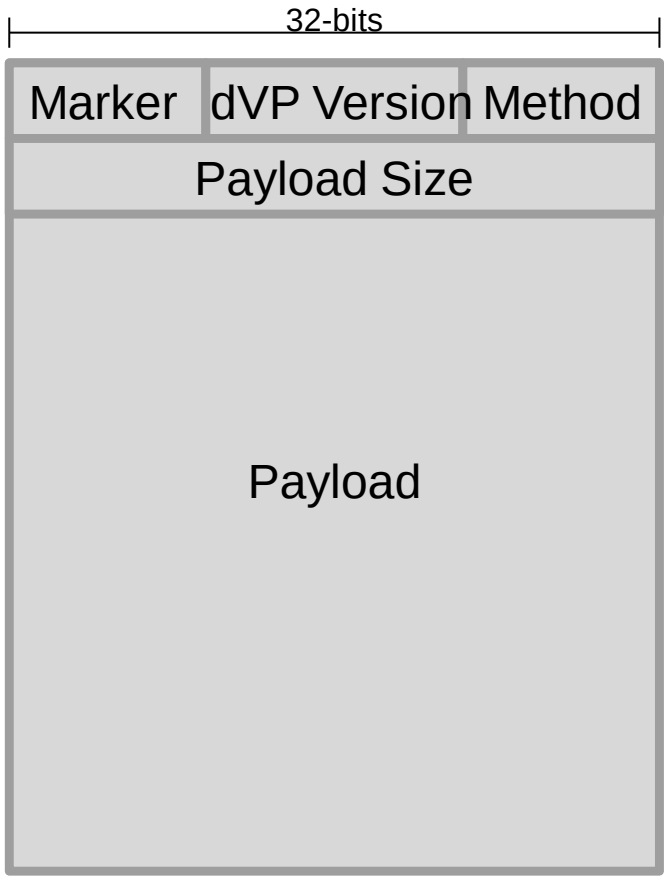


4. DOTNETVIS COMMUNICATION

Protocol (dVP)

- Necessity
- Packet transport - TCP
- Packet Structure

- Methods
  - Requests
  - Responses



Library

- **Transmitter**
- **Receiver**

- **Communication Channel Initialisation**
  - TCP connection
  - Data Streams

- **dVP Packet creation**

- **Sending data**
- **Receiving data**
  - Identification
  - Worker Thread Utilisation
  - Storage
  - List indexing

- **Point3D custom-defined struct**

API

- **Sending data**
  - Transmit()
    - Packets
    - Status messages
- **Retrieval of stored data**
  - Initial retrieval
  - Retrieval using indeces
- **Flexibility**
  - Usage of API
  - Data Types

6. EXTENSIONS

Less complex

- Colour schemes and legends
- Intelligent reference frames
- Capture file playlist with queing
- Client side packet filtering

More complex

- Intrusion detection through intelligent pattern analysis
- Range of graph types

- Evolving dVP components into a flexible visualisation framework

THE END

QUESTIONS?

Presented By: Christopher Schwagele