



## ***What is SyDat and how can it help improve systems design, development, integration and testing?***

**SyDat** is a through life system interface design and integration tool that can be used from inception of a project into maintenance. **SyDat** supports the capture, design, testing and intelligent monitoring of system interfaces, providing off the shelf test equipment and intelligent black box recorders that can be deployed to ensure that integration and 'in service' faults are analysed and corrected in the shortest possible time.

The **SyDat** project team at Hawkgrove understand the following risks with systems development:

- English descriptions of communications interfaces and other data providing interfaces are often ambiguous. Even minor ambiguities can cause major problems.
- In a multi component system where there is more than one supplier, misinterpretation of ambiguities in specifications is often the cause of problems during system integration
- System builders need representative interfaces and data to help them design and test their systems
- System builders create simulators based on their "understanding" of the specifications, hiding faults until late in the project. They need these to prove their system.
- Project development costs and timescales must include bespoke supplier test equipment, the ambiguities in the specifications compound the risk.
- Through life costs are impacted by all of the above

**SyDat** provides the vital information required by project personnel to support the process of design, test and integration of control and communication systems.

**SyDat** creates computer based descriptions of data exchanged between systems, these descriptions are used to automatically configure data monitoring and generation facilities, minimising the need for bespoke test and simulation equipment.

**SyDat** uses an open interface enabling project personnel to produce custom, project specific, data access points (agents) removing reliance on the SyDat project team.

**SyDat** can easily be customised to interpret legacy code or non standard client interface specifications, or display data in a bespoke format.

Using **SyDat** adds software-assisted rigour to interface development and testing, thereby reducing the common systems integration risks.

Using **SyDat** provides organisations the opportunity to improve their business bottom line, reduce risks and improve the overall efficiency of system development, integration and testing.

How can **SyDat** do this?

Imagine a system or collection of systems, communicating using various types of interface (LAN, serial, discrete etc.). This could be an aircraft mission system, naval weapon system, vehicle engine management system, rail signalling system, air traffic management system. In fact SyDat is designed to support systems development in any vertical market.

Each system relies on data received from other system components to fulfil its purpose. There are three basic components of a system:-

1. Functional – what this system does
2. Logical Interface – the data exchanged between this and the other systems
3. Physical Interface – the mechanisms used to transfer data between this and the other systems

What end-users see and experience is the overall function of the system as a whole, yet only 1 out of the 3 components above is related to function. It is fair to say that the data exchanged between systems and how that data is physically transferred are a critical part of the process of producing a working overall system.

Effective testing and integration of the interfaces will clearly have a large impact on the probability that the project will succeed. Especially if these interfaces are shared across many suppliers, all of whom require a means of testing these interfaces, but as yet do not have a common, supplier independent and generic way of testing.

Traditionally, safety related or critical developed projects employ as many as 20 testers for every 30 engineers; the cost of bespoke test equipment can be as much as 10% of the overall cost of the product itself depending on the type of the project. For projects these are significant overheads, as much as 40% of the total project budget can be allocated for component, integration and system testing. There is plenty of scope for cost saving in the testing phases of the project if it is looked at carefully and improved, reusable, methods of testing are used.

### What does **SyDat** do?

**SyDat** uses an innovative approach for systems interface design, allowing the end user to electronically specify the system interconnections and data formats.

This information is used by **SyDat** to seamlessly support the generation of test data, in the form of scripts, and provide the capability to display, log and playback data in Real-Time, whilst providing Human Readable, Intelligent, Monitoring Information in an intuitive way.

**SyDat** treats interface testing as its primary role, whilst it can also be used as part of an effective, scripted, solution to black box test components on the target system. This allows users to easily perform regression testing and post delivery fault finding.

### How does **SyDat** do this?

#### *Imagine this...*

Take the worst case project; a collection of systems communicating with many different bespoke interfaces, each one being designed and delivered by different suppliers.

Simply put, this can be a project development nightmare which is only realised when each of the components are delivered for system/integration testing.

Finding problems at the end of a project is the worst time, as there is little time left to correct them and the cost of correcting them is at its most expensive.

#### *Now Imagine this...*

All of the system component suppliers use **SyDat** and are supplied with a common set of system interface and data definitions and data agents to connect to or replace the system interfaces as required by each supplier.

All of your suppliers will now be using the same electronic interface definitions, supported by common agents and tools allowing them to generate and monitor data using common components of the **SyDat** suite. The testing infrastructure

is now common across the project and all suppliers are performing “early integration”, even when those other systems are not complete.

When the system components are delivered for systems integration, the problems traditionally experienced will be considerably diminished or removed completely.

Using **SyDat**, inter-system communications will be achieved immediately allowing the system specifier/integrator to analyse system behaviour from the outset using the same tools already being used to prove the operation of the individual components by the suppliers.

*So, to summarise...*

An integrated **SyDat** approach to interface design and testing really does work, it really does provide “the path to successful system integration”. The cost savings could be as much as 20% of the overall testing budget.

A brief benefit summary of the different **SyDat** components shows how **SyDat** can deliver...

- **SySpec**
  - Facilitates the formal definition of technical interfaces between systems
  - Enables the sharing of formal definitions across and between suppliers
  - Guarantees consistent definitions are used throughout system development, testing and integration
  - Automatic reuse of existing specifications and test data
  - Open system through the use of import/export, add-in components and customisation
  - Intuitive use of system graphics improves identification of real-world components
- **SyStim**
  - Significant time saving when generating large amounts of test data
  - Automated regression testing saves time and improves quality
  - Flexibility enables automated or manual testing as required by the user
  - Facilitates integration testing even if supplier/system components are missing
  - Playback SyMon logs as scripts allowing captured failures to be swiftly corrected
- **SyMon**
  - Rapid identification of incompatibility issues
  - Simple verification of the solutions to issues
  - Intuitive use of system graphics improves identification of real-world components
  - Optimised use of resources by performing fault diagnosis offline
- **SyRule**
  - Automated pass fail testing, delivering significant time savings and improved accuracy
  - Efficient approach to the resolution of system errors
- **Summary**
  - Enhanced through life cycle support as systems evolve
  - Reduced overall timescales
  - Reduced cost of developing, testing and maintaining systems
  - Reduced project risk
  - Mitigated risk improves profits
  - Improves performance and competitive position
  - Customers are satisfied and may choose you over other suppliers
  - Helps organisations become leaders in their markets

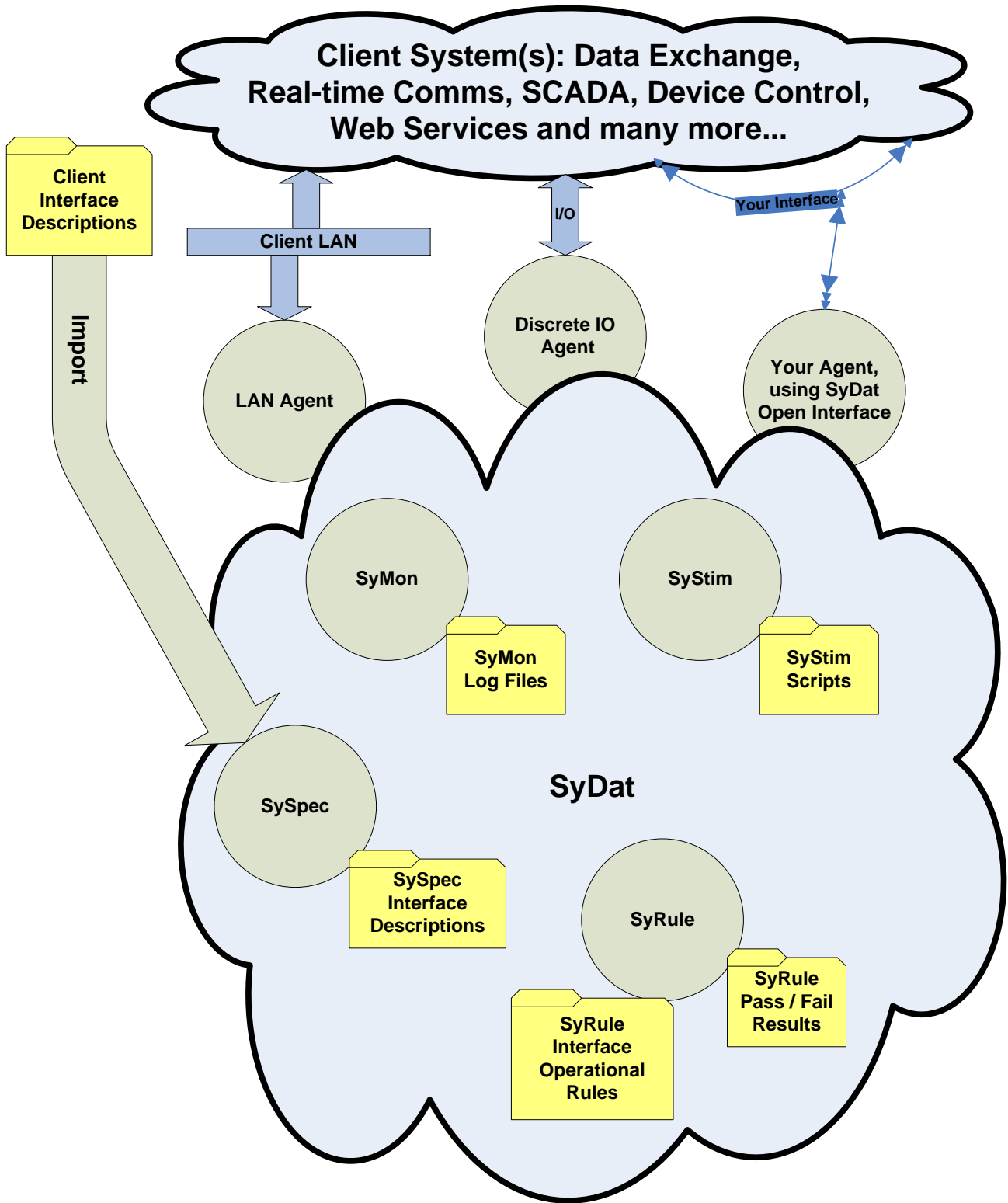


Figure 1 - SyDat Context Diagram