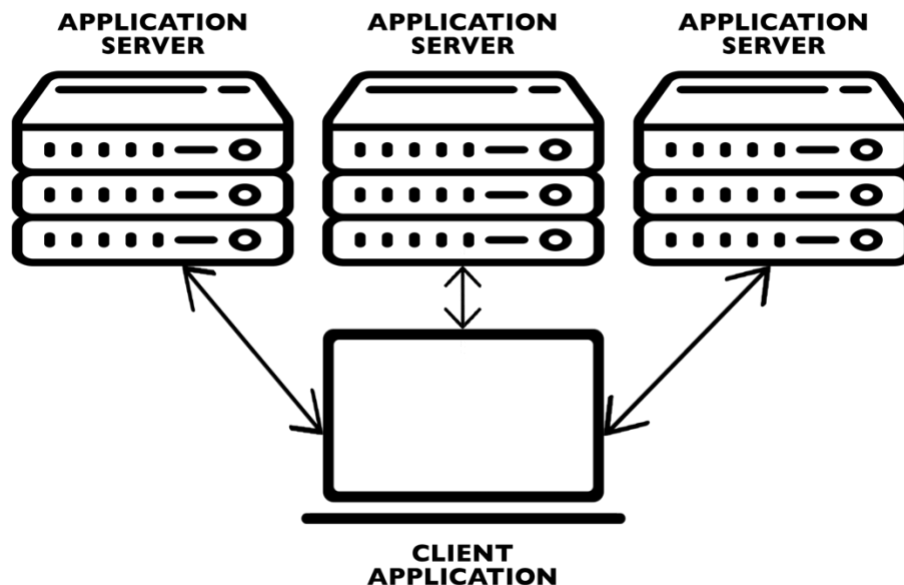


Integrating TANGO with Client CMMS

At 24/7 Systems, information integration is a pillar of successful reliability programs. One barrier for any program is the integration of outside asset health systems like TANGO™ with client's in-house work management systems, like a CMMS.

As the reliability information documented in TANGO grows and matures, clients may increase the value of this information and eliminate double-entry work by automatically integrating collected information from distributed sources with various in-house systems that support the client's overall reliability program.



Web Services

To initiate this integration, TANGO uses Web services to provide a secure and trustworthy link between TANGO and the client CMMS. TANGO's Web services are prebuilt and designed for simple and customizable integration links with a client's Web service. These Web service links are easy to build and hard to break, ensuring data transmission is reliable and, more importantly, secure.

We want to protect TANGO as much as clients want to protect their CMMS. When transmitting data, TANGO and CMMS Web services act as intermediaries between the host's endpoint systems providing an additional layer of security for all communication. Though these end points are foreign, the intermediaries speak the same language and only requests and responds with vetted and translated data. No more, no less.

Most CMMS already have a Web service available to help integrate the CMMS data with outside systems. This Web service can simply be formatted to request and receive TANGO data. If a client Web service is not available or a new Web service is preferred, 24/7 Systems can help design and build a new Web service suitable to the client's needs.



SOAP Messages

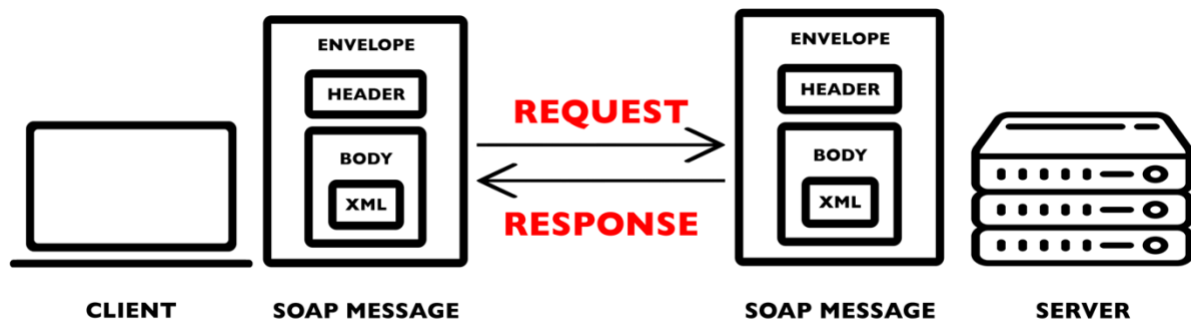
When a request is made to a Web service, the Web service automatically generates and sends a response back. There are several ways to handle these communications. For TANGO Web services, these requests and responses are SOAP messages.

SOAP (Simple Object Access Protocol) defines how Web services communicate. SOAP ensures universal and easy integration for server (TANGO) to client (CMMS) and is best used in decentralized distributed environments.

All SOAP messages are written in XML (Extensible Markup Language). XML uses simple text files designed to be both human and machine-readable. XML is universally accepted like HTML, can easily format server-to-client data, and is an optimal way to store and transport data over the web.

Each SOAP message:

- Sets formatting rules for the message.
- Encapsulates the message in an envelope.
- Defines what the message will contain.
- Adds rules for translating the content.
- Defines how the message will be sent.
- Sends the message.



Concert API

Concert API is a TANGO designed SOAP protocol used for communication between Web services. Concert API was designed to allow user systems to, automatically or manually, connect with TANGO to request and/or return data. Concert offers dozens of connection options that, once built, work perpetually. Single build... endless usage... minimal labor.

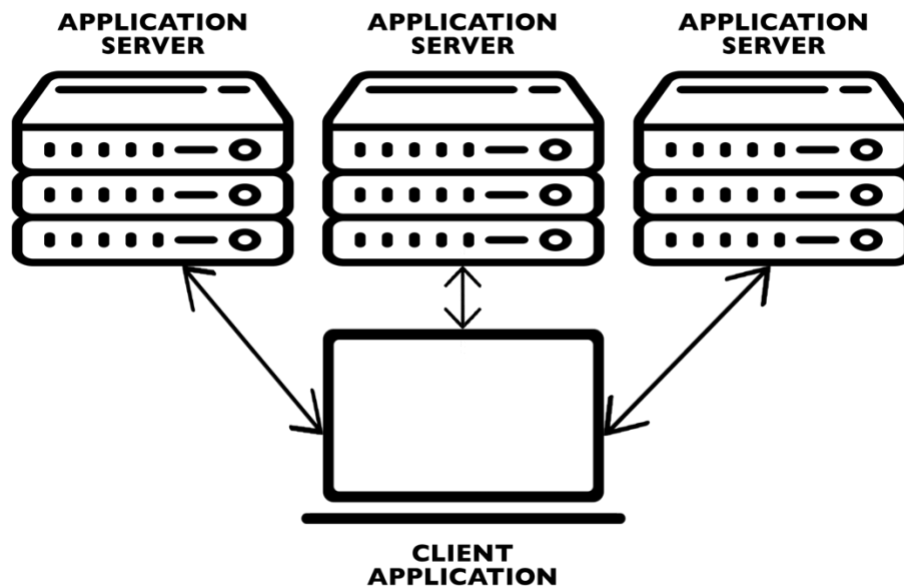
Most clients use the Concert API to:

- Create, in their CMMS, work orders from condition problems documented in TANGO.
- Request, from TANGO, work order numbers which are returned by their CMMS.
- Receive, from TANGO, condition problem status updates.
- Import, from oil labs, oil testing results to Oilography.

Others use Concert API to:

- Create, from 3rd-party software, condition problem entries in TANGO.
- Report, from TANGO, collected data to their custom applications.
- Export, from TANGO, equipment and location structure information for CMMS audits.
- Import, from their CMMS into TANGO, component hours for remaining life calculations.

As each user's needs are unique to their program, Concert API connections to/from TANGO must be set up with 24/7 Systems. We will work with the user's IT professionals to properly integrate and test the requested connections.



Example: Creating Work Orders

In response to condition problems, users can reference CMMS work orders which may be entered manually or automatically.

For manual entries, maintenance planners use their CMMS to initiate work orders:

1. Generate work orders in their CMMS
2. Copy the reference numbers into TANGO.
3. When works are completed, planners will 'Checkoff' in TANGO and paste summary information into their CMMS.
4. The CMMS work orders will be closed by an authorized CMMS user.

For automatic entries, maintenance planners use TANGO's CMMS links to initiate work orders:

1. Click the 'CMMS' button for the appropriate action. This will send the condition information to the CMMS. Depending on customization, this will generate CMMS work requests or post the information to the CMMS' work orders till an authorized CMMS user completes and approves the transactions.
2. Once the work orders are generated in the CMMS, the reference numbers will be automatically sent back to the TANGO work order number field for each condition problem.
3. When work is complete, work orders closed in the CMMS will automatically send the updated condition information back to TANGO and complete 'Checkoff'.

Concert API Documentation

Support

- [XML Import Instructions](#)
- [WSDL Style Sheet](#)

Asset Health

- [Get Asset Health](#)
- [Get Asset Health Data](#)

Condition Entries

- [Check Off](#)
- [Check Off by Condition Entry GUID](#)
- [Condition Entries by Modification Time Range](#)
- [Condition Entries by Modification Timestamp](#)
- [Fetch Condition Entry Attribute Values](#)
- [Get Condition Entry Attribute Type Names](#)
- [Get Open Condition Entries](#)
- [Get Open Condition Entry Info Without Work Order Number](#)
- [Set Condition Entry Attribute](#)
- [Set Condition Entry Attribute by Work Order](#)
- [Set Condition Entry Value](#)
- [Set Work Order by Work Request](#)

Oil Data Submission

- [Add Oil Data Set Comments](#)
- [Fetch Comment Type List](#)
- [Fetch Linked Document Type List](#)
- [Fetch Oil Data Set Status List](#)
- [Fetch Oil Test List](#)
- [Fetch Oil Value Lab Status List](#)
- [Move Sample to Another Sample Point](#)
- [Send Sample Data to Partner Service](#)
- [Submit Oil Sample Points](#)
- [Submit Oil Test Data](#)
- [Swap Oil Data Set Location](#)
- [Update TF7 Sample Code with Lab Sample Code](#)

Concert API Documentation (continued)

TANGO Locations

- [Close Open Equipment Location History Entry](#)
- [Get Active Alias Mappings](#)
- [Get Alias Locations](#)
- [Get Attribute Type Definitions](#)
- [Get Location Info](#)
- [Save Tango Item Attribute](#)

TANGO Equipment

- [Add Equipment](#)
- [Close Open History Entry](#)
- [Current Equipment History Item](#)
- [Get Equipment Info](#)
- [Get Equipment Type Property Mapping](#)
- [Get Equipment Types](#)
- [Get Property Units](#)
- [Get Vendor List](#)
- [Save Vendor](#)
- [Transfer Equipment to Location](#)

TANGO User

- [Add User](#)
- [Add User Session](#)
- [Fetch Uri Type List](#)
- [Get Customer Info](#)
- [Update User](#)
- [Uri](#)
- [User List](#)