



14. Service-Oriented Architecture for Integration

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Activity constructs include

- ▶ The BPEL language commands are called Activities
- ✓ Invoke an operation on a Web service (<invoke>).
- ✓ Wait for an external message (<receive>).
- ✓ Generate a response for input/output (<reply>).
- ✓ Wait for some time (<wait>).
- ✓ Copy data between locations (<assign>).
- ✓ Indicate that an error occurred or something went wrong (<throw>).

CONT...

- ✓ Terminate the entire service instance (<terminate>).
- ✓ Do nothing (<empty>).
- ✓ Define a sequence of steps to be executed in a specific order (<sequence>).
- ✓ Branch using a “case statement” (<switch>).
- ✓ Define a loop (<while>).

CONT...

- ✓ Execute one of several alternative paths (<pick>).
- ✓ Indicate that steps should be executed in parallel (<flow>).
- ✓ Indicate fault logic processing via <throw> and <catch>. Define compensation for error recovery; implement compensating actions for any irreversible actions in error.
- ✓ Fault handling and compensation can be supported recursively by specifying the relevant scope of execution.

In a message exchange, any Web service described by WSCI can interact with

- ▶ Other Web services, whose implementation has been derived by their WSCI description;
- ▶ “Hard-coded” software components with internally encoded mechanisms to guarantee the correct sequence of the exchange;
- ▶ Or human-controlled software agents where the human determines the sequence of interaction within the constraints of the WSCI description.

BPML includes

- ▶ action: Performs or invokes an operation involving the exchange of input and output messages.
- ▶ assign: Assigns a new value to a property.
- ▶ call: Instantiates a process and waits for it to complete.
compensate: Invokes compensation for the named processes.
delay: Expresses the passage of time.
- ▶ empty: Does nothing.

CONT...

- ▶ `fault`: Throws a fault in the current context.
- ▶ `raise`: Raises a signal.
- ▶ `spawn`: Instantiates a process without waiting for it to complete.
- ▶ `synch`: Synchronizes on a signal.

Child activities.

- ▶ all: Executes activities in parallel.
- ▶ choice: Executes activities from one of multiple sets, selected in response to an event.
- ▶ foreach: Executes activities once for each item in an item list.
- ▶ sequence: Executes activities in sequential order.

CONT....

- ▶ switch: Executes activities from one of multiple sets, selected based on the truth value of a condition.
- ▶ until: Executes activities once or more based on the truth value of a condition.
- ▶ while: Executes activities zero or more times based on the truth value of a condition