

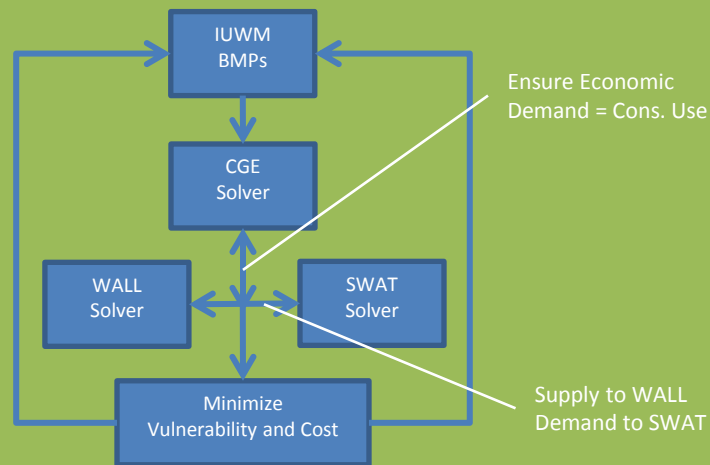
Model Integration with SWAT

A publish-subscribe type system

June 24, 2013

André Dozier and Olaf David

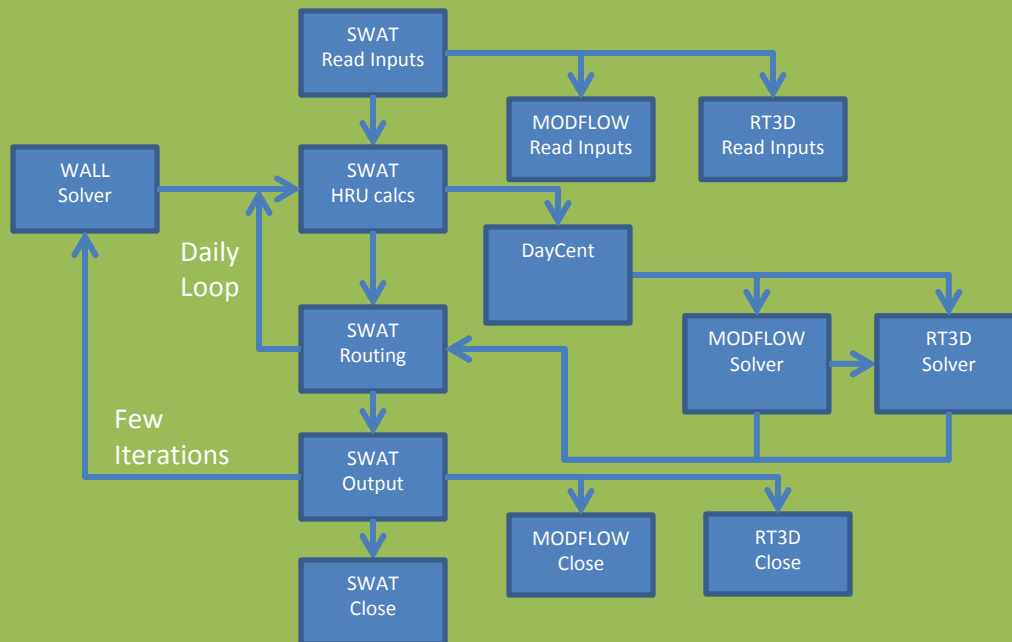
Optimization – yearly (or 2-5 year) and 30-50km resolution



Pareto optimal
curve of
management
solutions

Manually
add model
detail

Detailed Assessment Model – daily and 1-5km resolution



Linkages

- Need to add two linking components

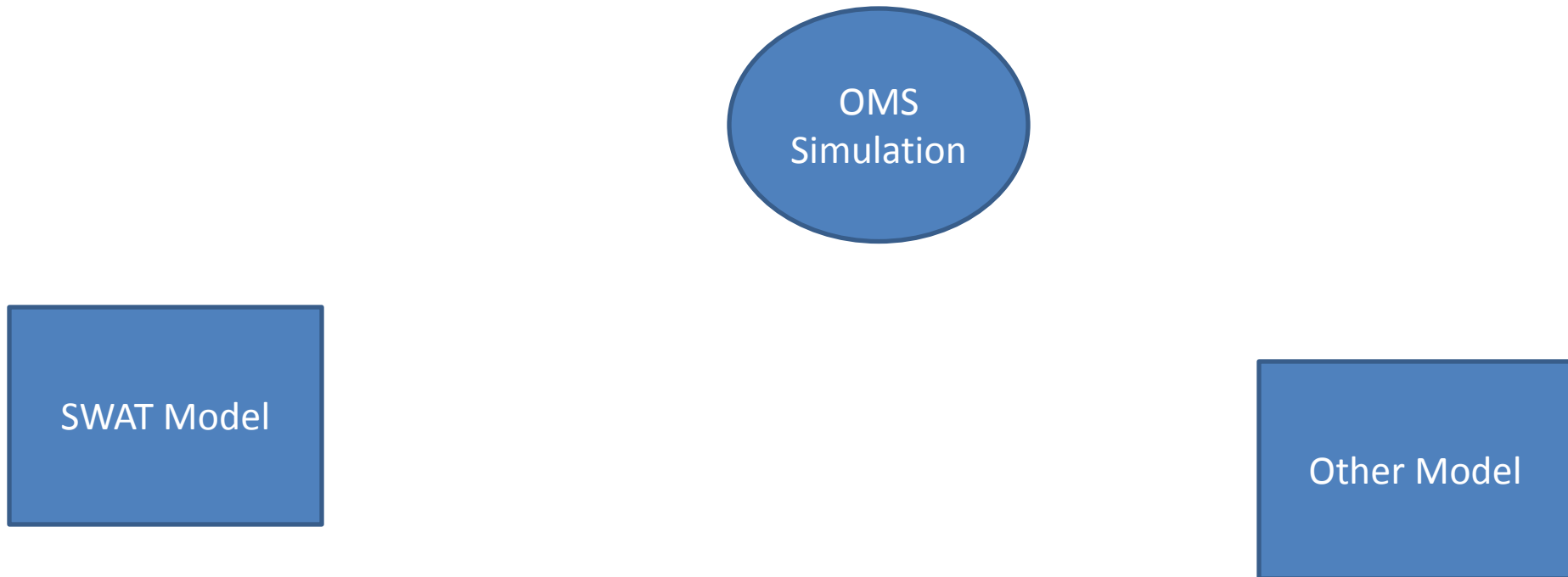


SWAT Model

Other Model

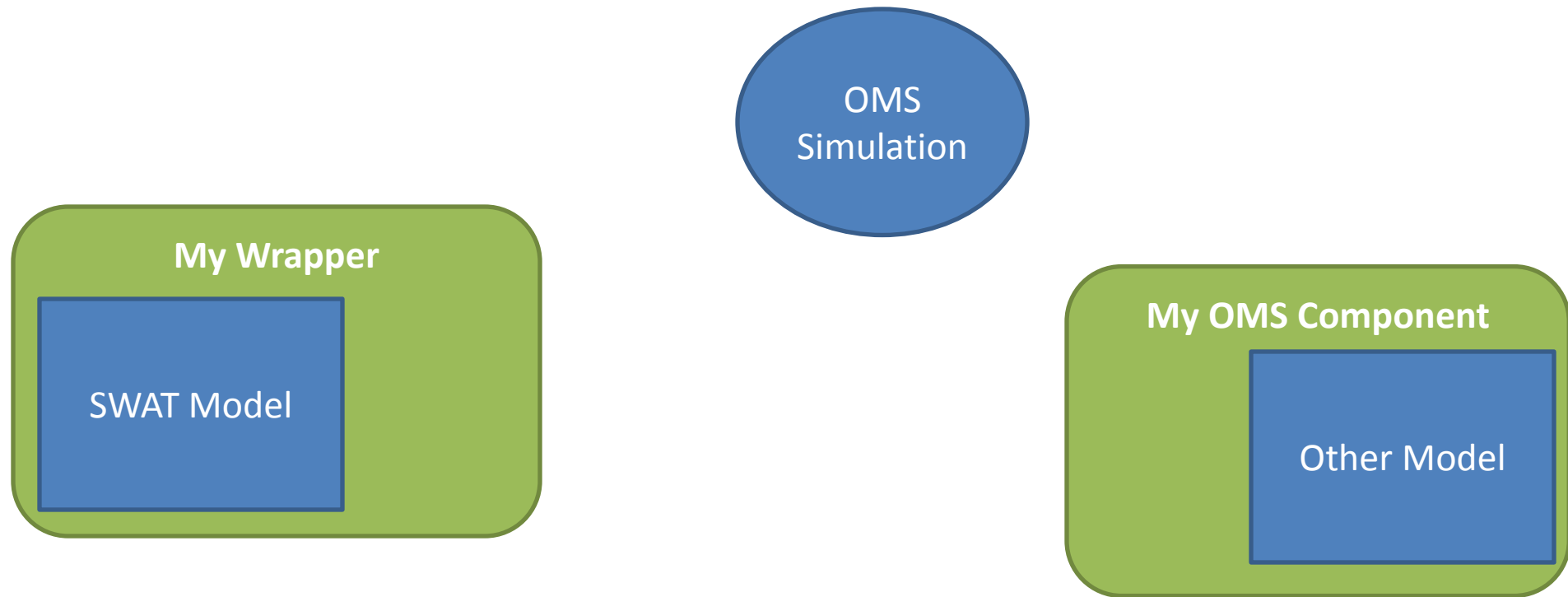
Linkages

- Need to add two linking components



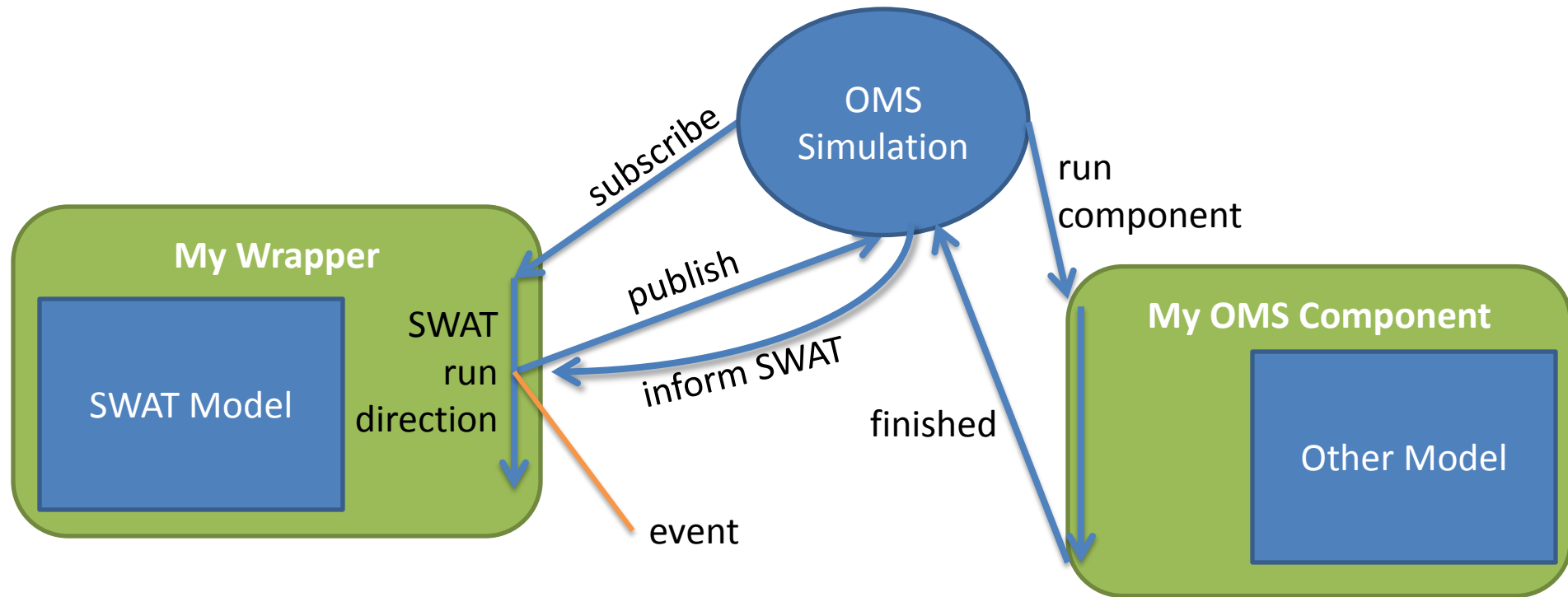
Linkages

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Linkages

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My Wrapper

Special OMS Component

- Event names
- Event inputs
- Event outputs
- Communication via MPI
(use blocking sends)

My OMS Component

Other Model

Linkages

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My Wrapper

Special OMS Component

- Event names
- Event inputs
- Event outputs
- Communication via MPI
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My OMS Component

Normal (or special if desired) OMS component

- Inputs
- Outputs
- Execution subroutine

Linkages

- Need to add two linking components



Simulation specifications

- location(s) or NULL
- Native or managed?

My Wrapper

Special OMS Component

- Event names
- Event inputs
- Event outputs
- Communication via MPI
(use blocking sends)

My OMS Component

Normal (or special if desired) OMS component

- Inputs
- Outputs
- Execution subroutine

“Events” in SWAT

SWAT

Start

Read Inputs

Year Loop

Month Loop

Daily Loop

End

End

End

“Events” in SWAT

SWAT

Start

Read Inputs

Year Loop

Month Loop

Daily Loop

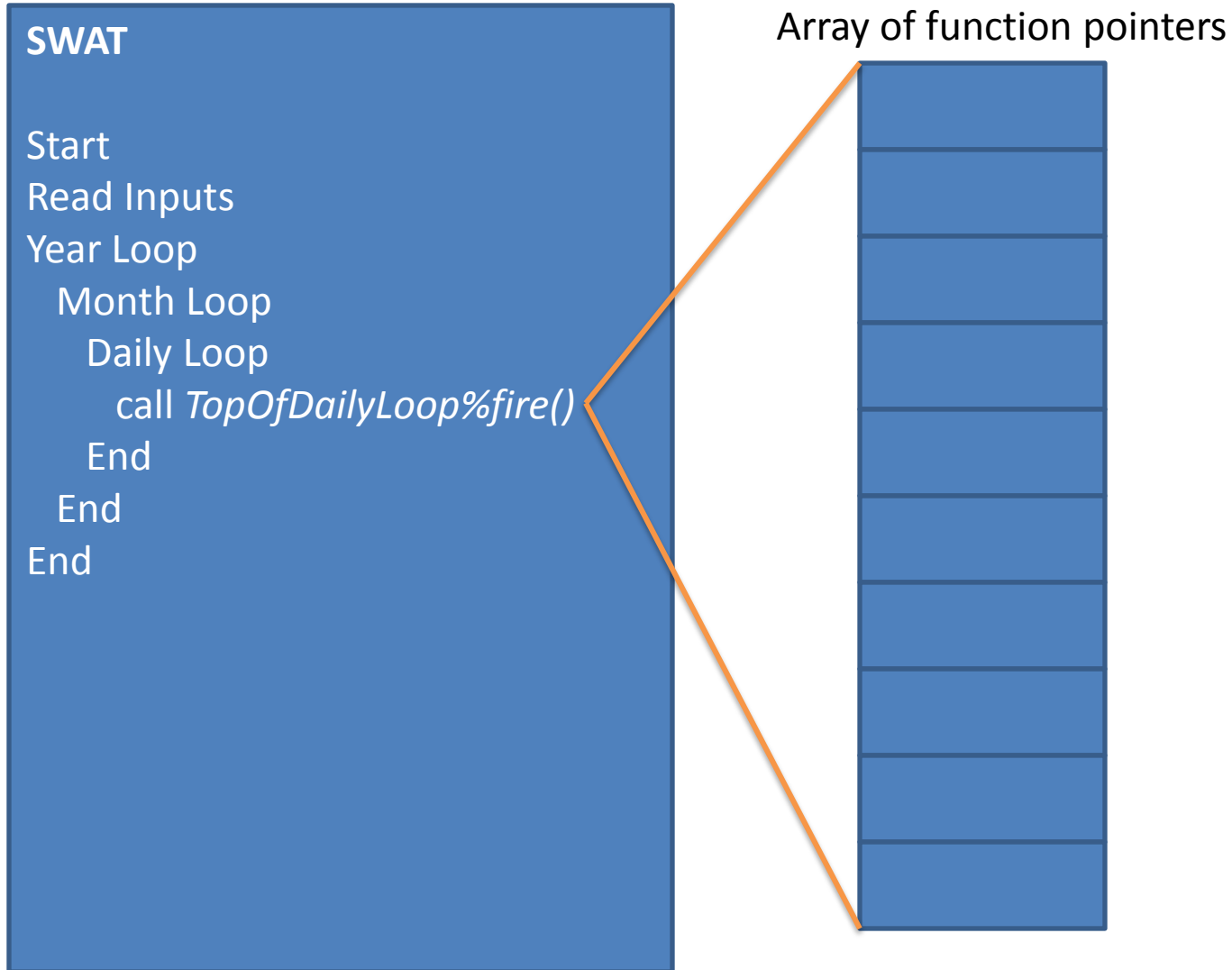
call *TopOfDailyLoop%fire()*

End

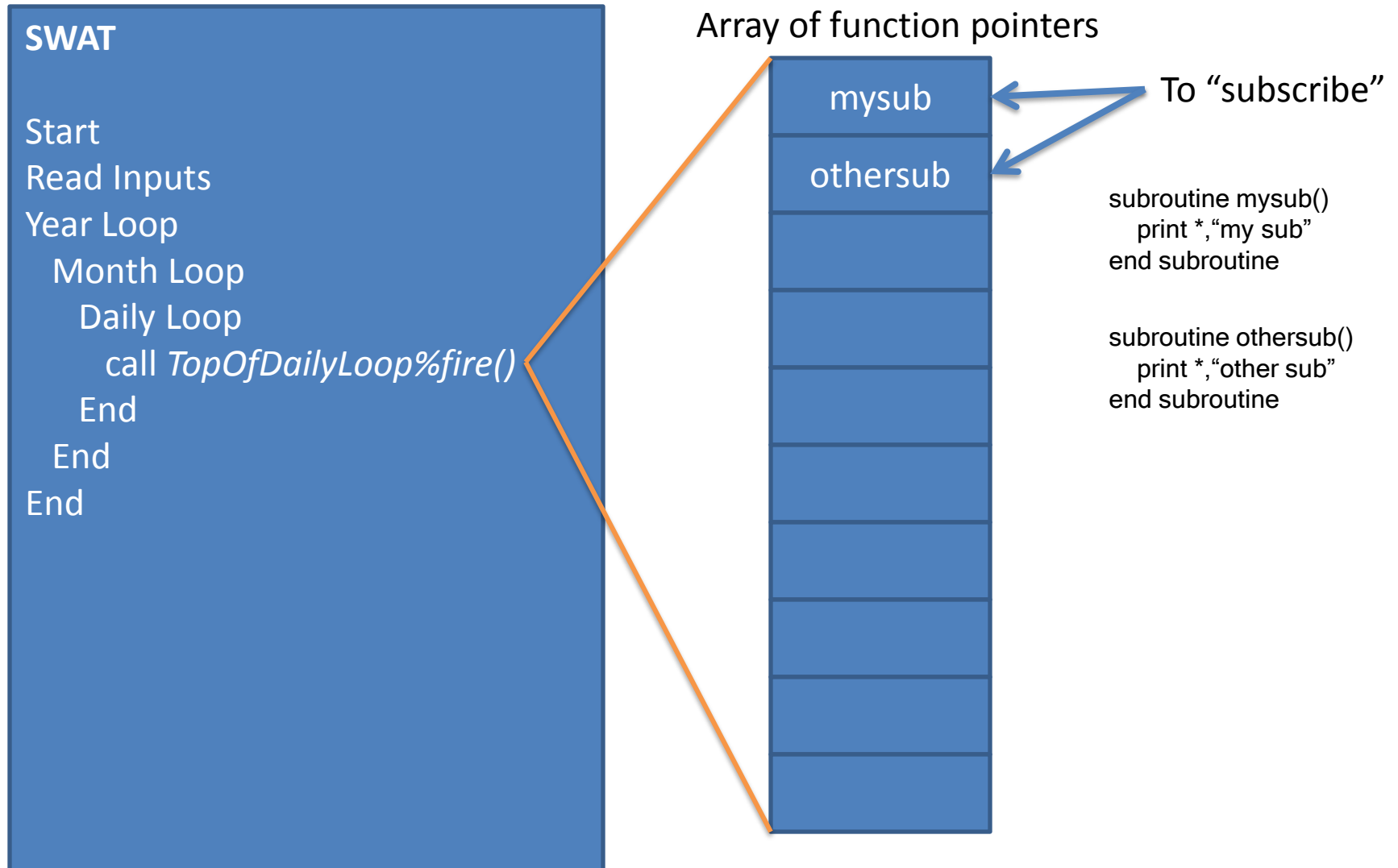
End

End

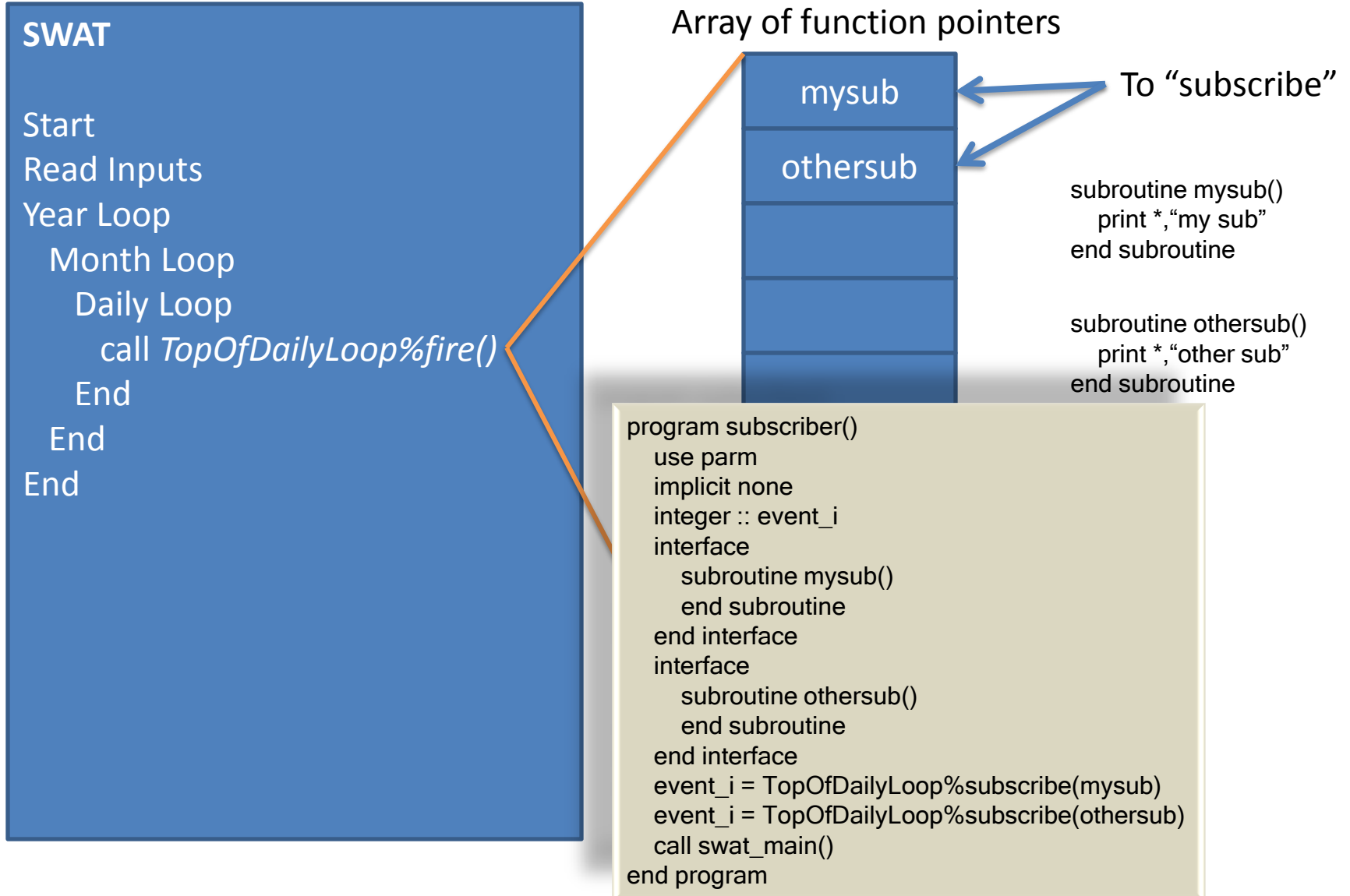
“Events” in SWAT



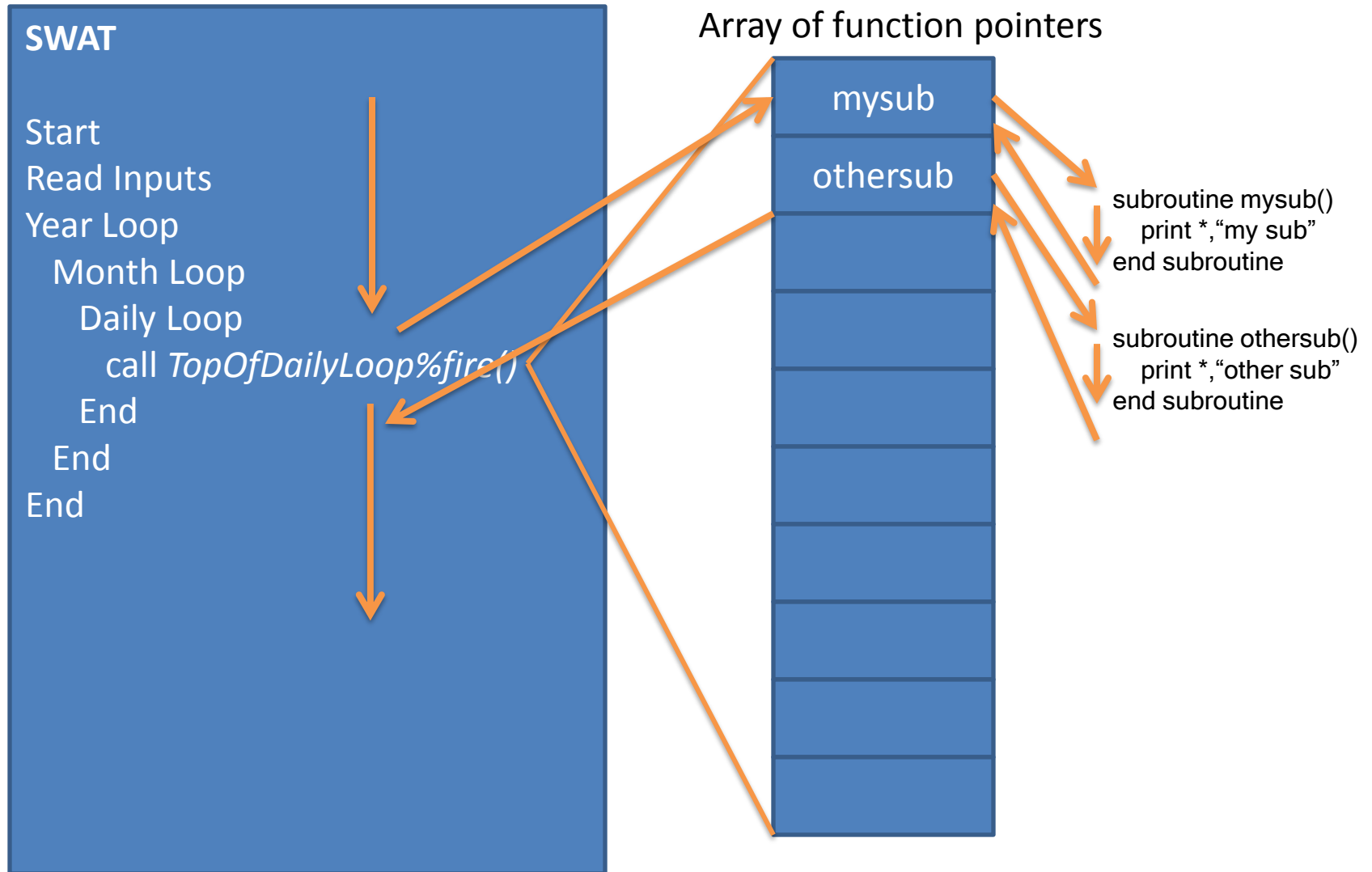
“Events” in SWAT



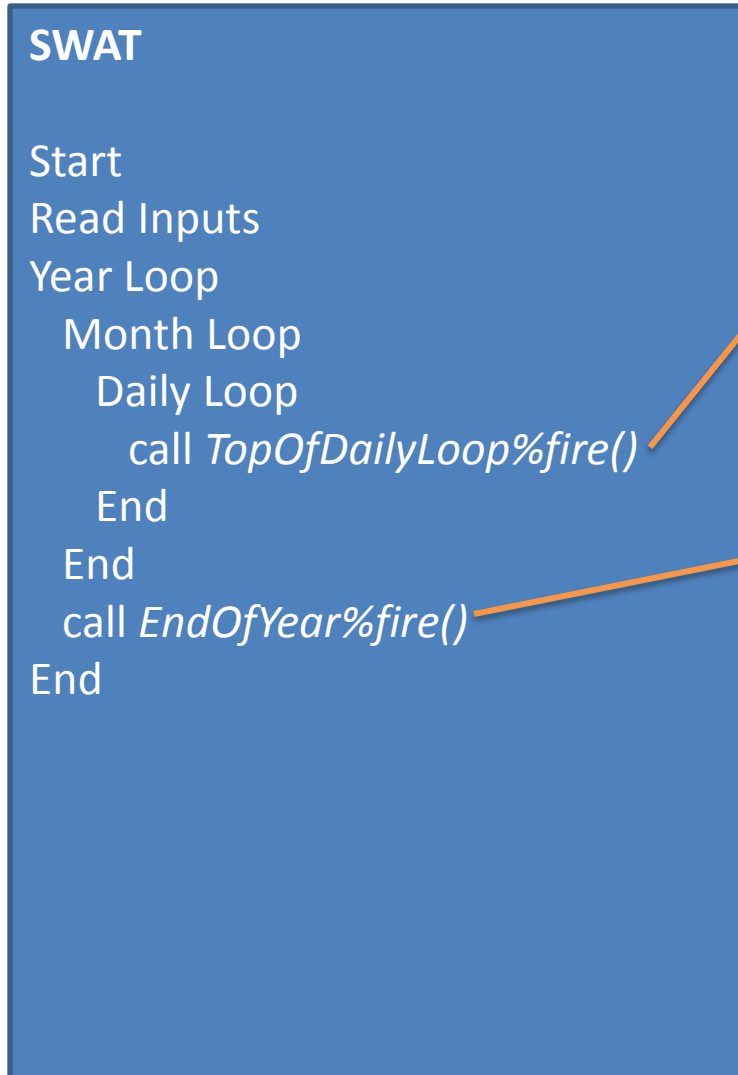
“Events” in SWAT



“Events” in SWAT



Special OMS-SWAT Component



mpi_input

```
subroutine mpi_input()
  use parm

  ! Variable initialization

  ! MPI inputs
  call MPI_RECEIVE(buf, ...)

  ! Variable dereferencing

end subroutine
```

mpi_output

```
subroutine mpi_output()
  use parm

  ! Variable initialization

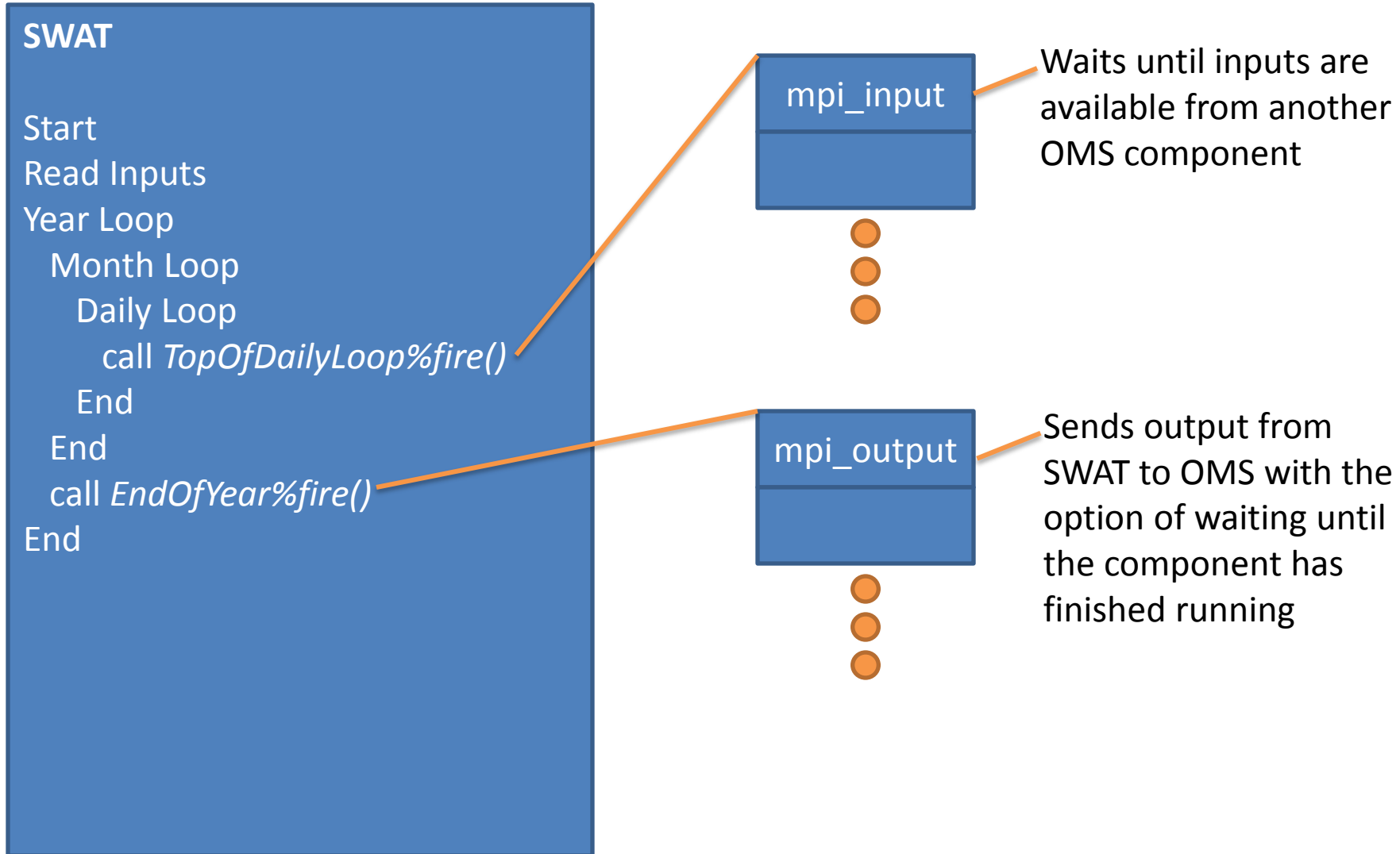
  ! MPI outputs
  call MPI_SEND(buf, ...)

  ! MPI wait until finished
  call MPI_RECEIVE(buf, ...)

  ! Variable dereferencing

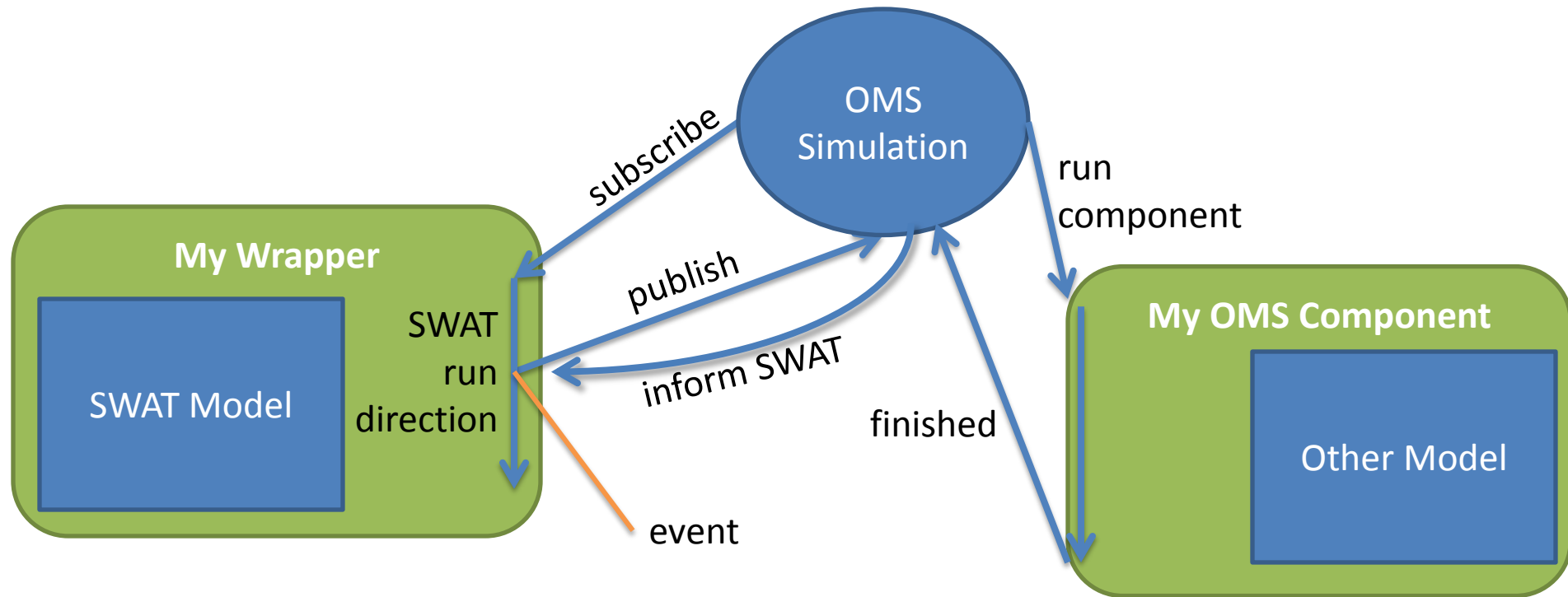
end subroutine
```

Special OMS-SWAT Component

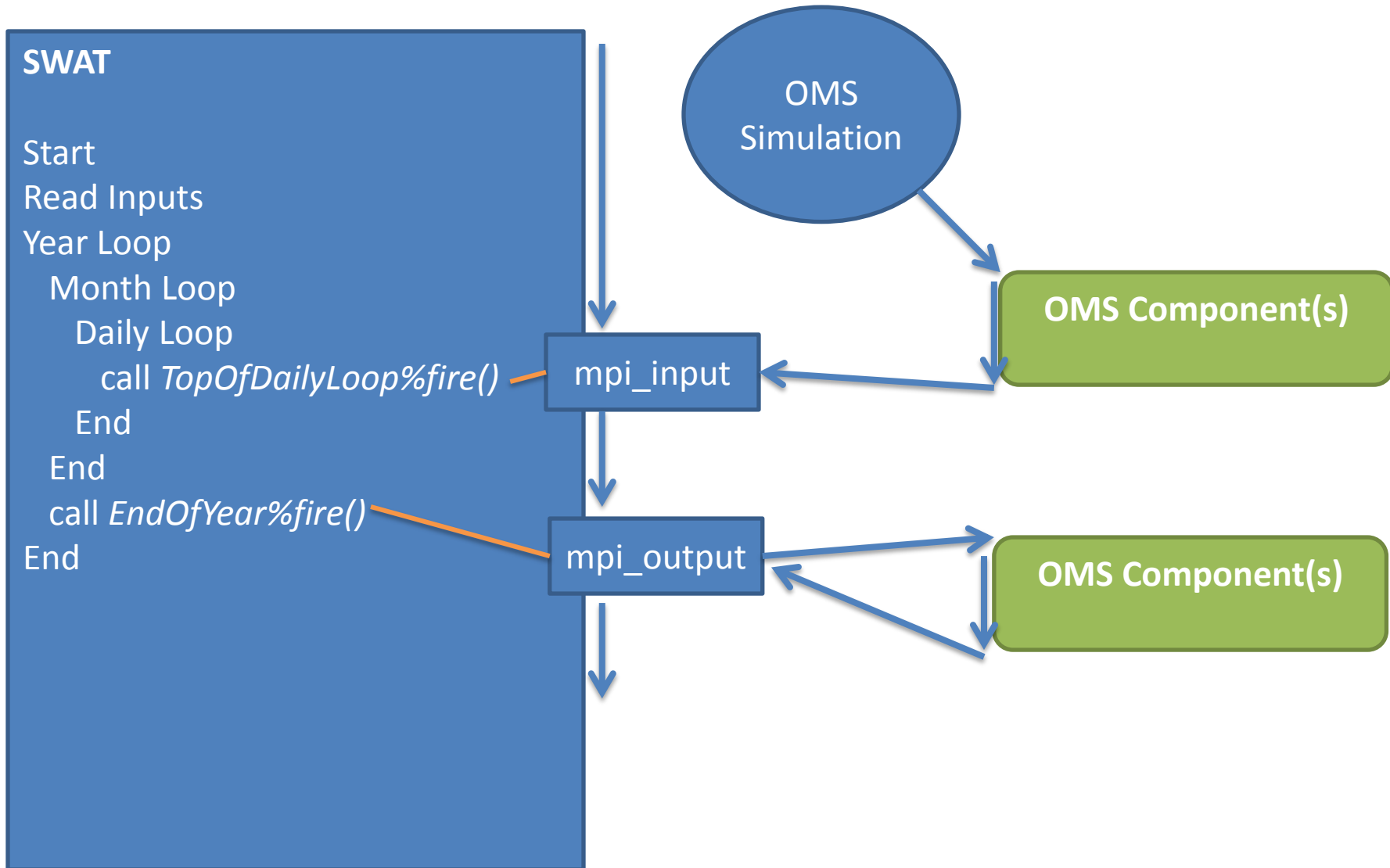


Linkages

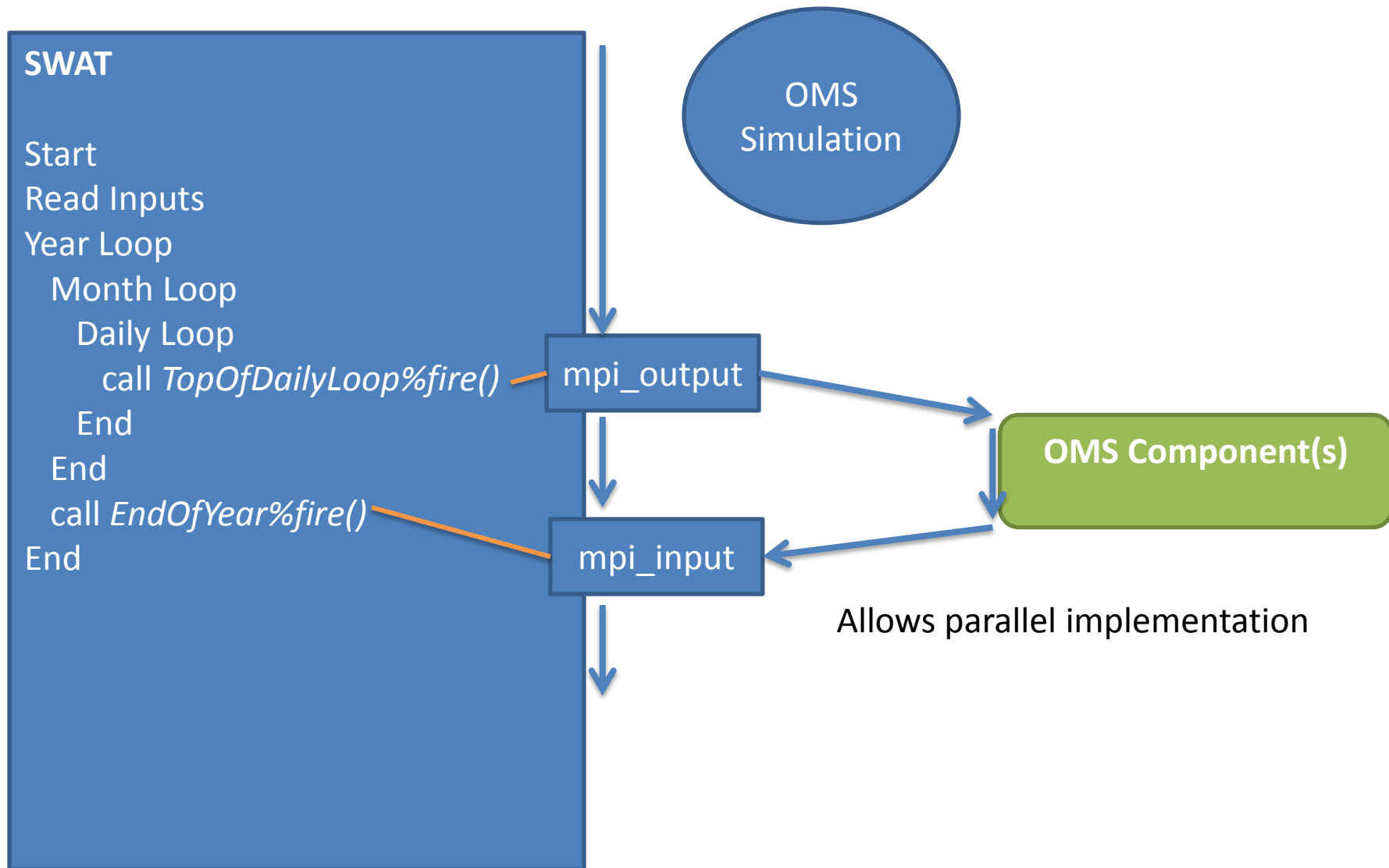
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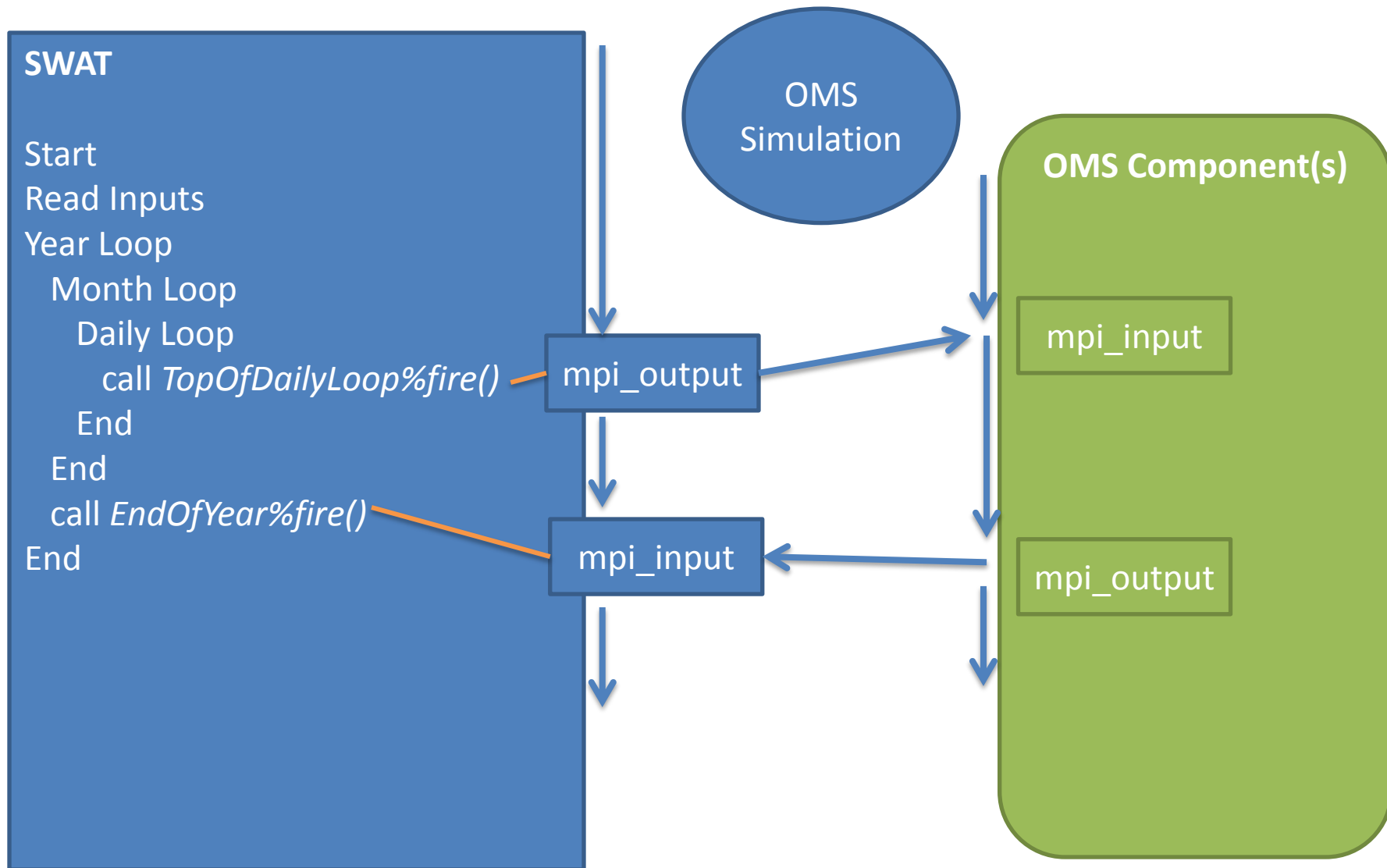
One Possible Orientation



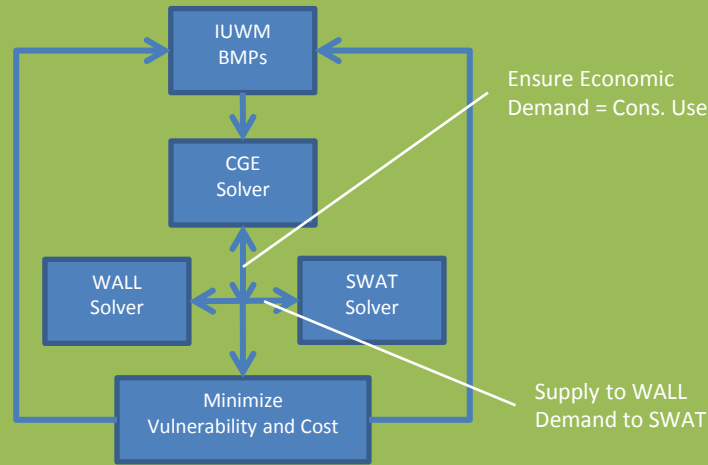
Another Possible Orientation



Yet Another Possible Orientation



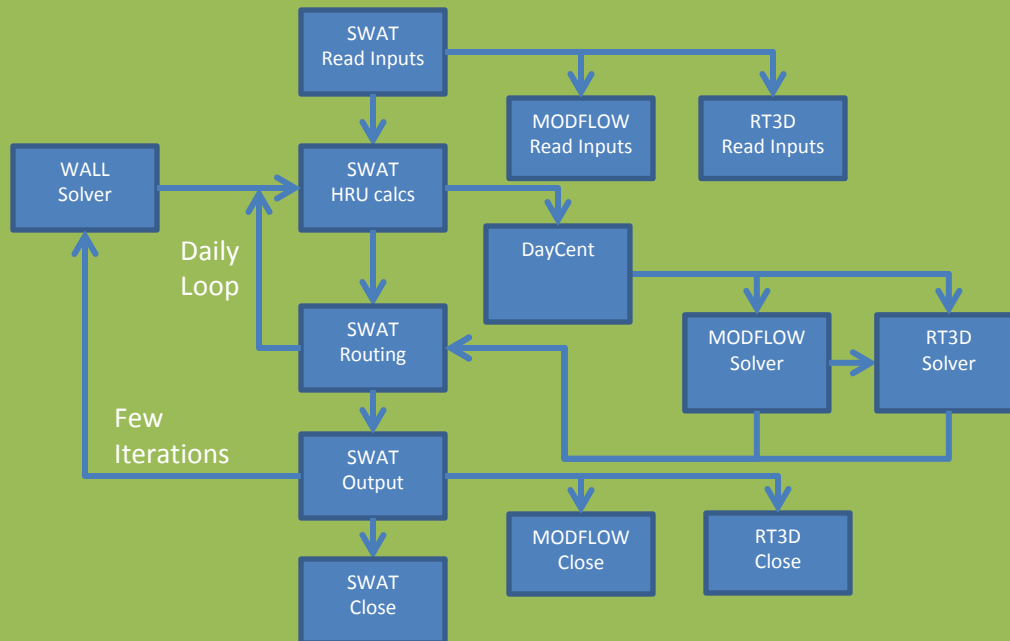
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First test case

