



Esri International Developer Summit
Palm Springs, CA

Extending ArcGIS GeoEvent Processor with new processors



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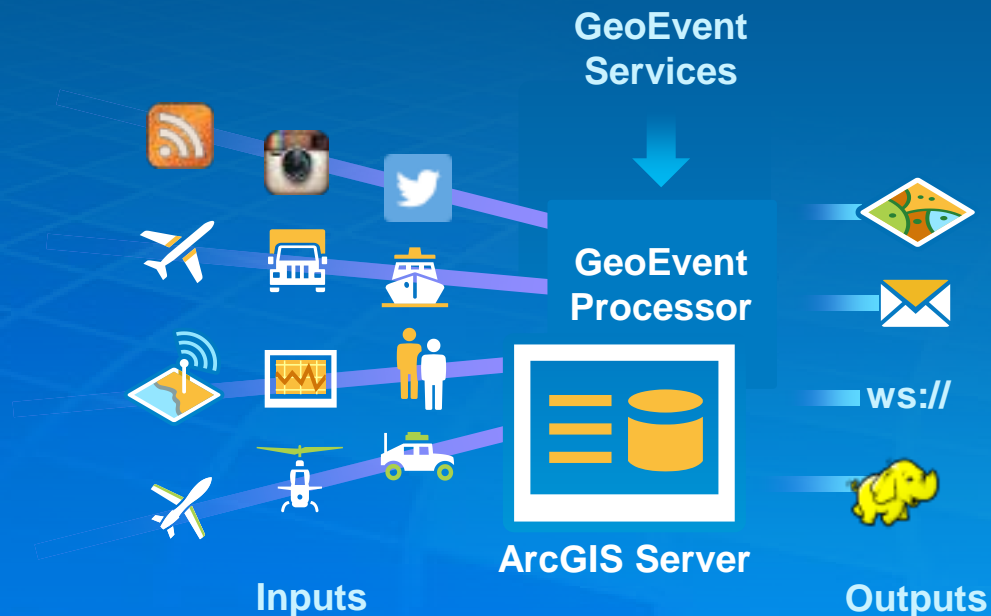


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What is ArcGIS GeoEvent Processor for Server?

Overview

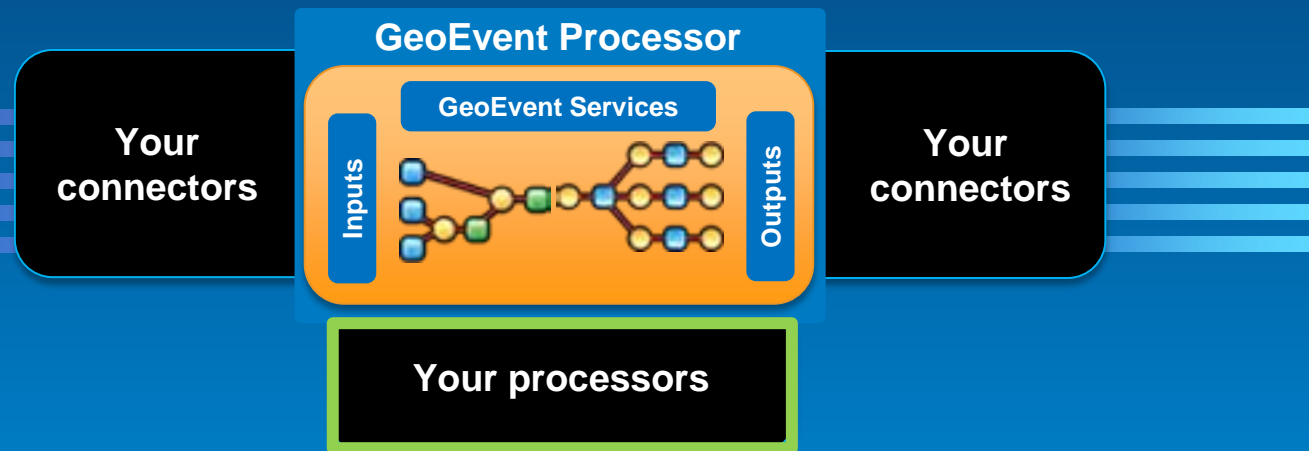
- ArcGIS Server extension
- Integrates real-time streaming data into ArcGIS
- Performs continuous processing and real-time analysis
- Sends updates and alerts to those who need it where they need it



Extending GeoEvent Processor

Extending Capabilities

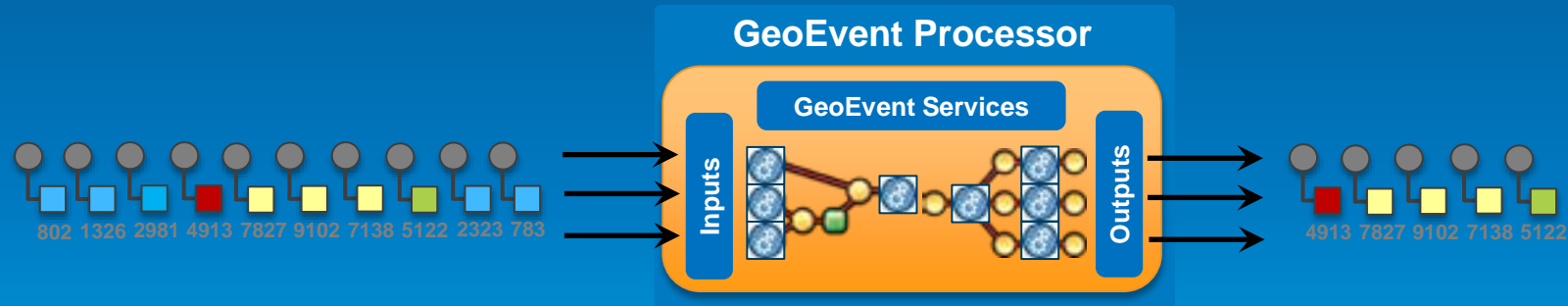
- You can create your own custom connectors and processors using the GeoEvent Processor **Software Development Kit (SDK)**



Extending GeoEvent Processor

What is the Processor?

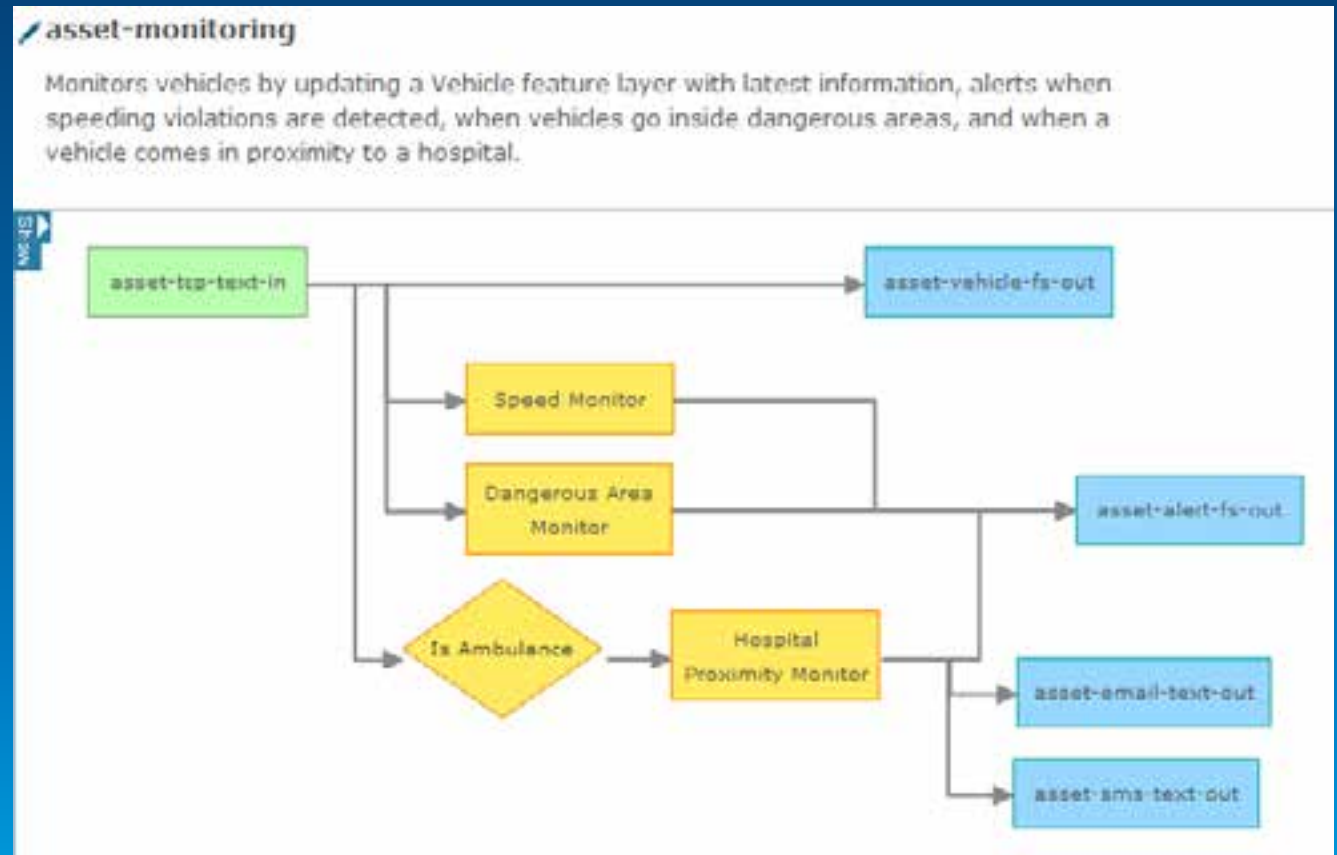
- Software component written in Java 
- User configurable
- Performs specific actions on GeoEvents
- Runs continuously inside of server processing environment
- Shares lifecycle with GeoEvent Service



Extending GeoEvent Processor

What is GeoEvent Service?

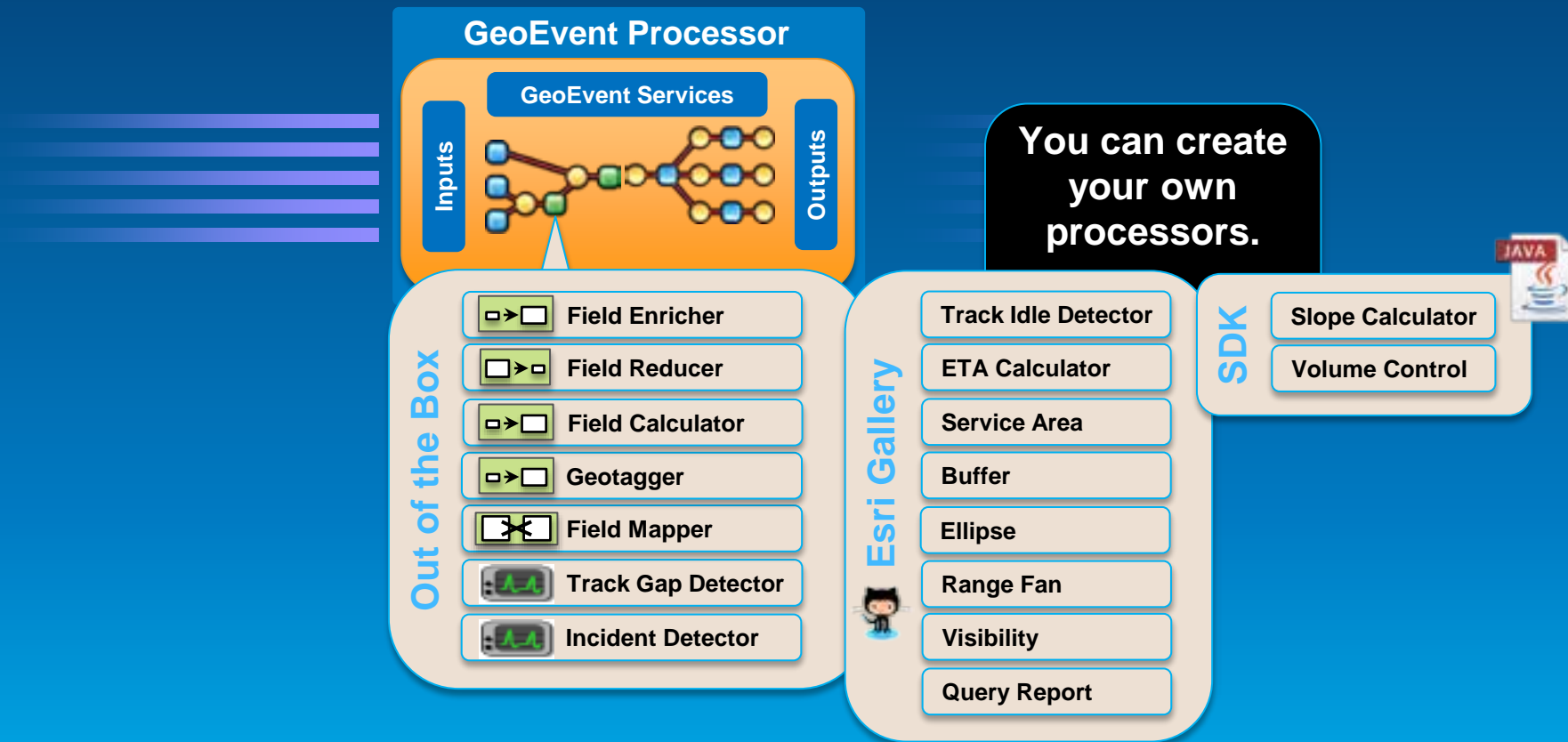
- References inputs and outputs
- Configures processing elements (filters and processors)
- Configures the flow of GeoEvents
 - what input(s) to receive them from,
 - what **Filtering** and **Processing** steps to perform,
 - what output(s) to send the results to.



Extending GeoEvent Processor

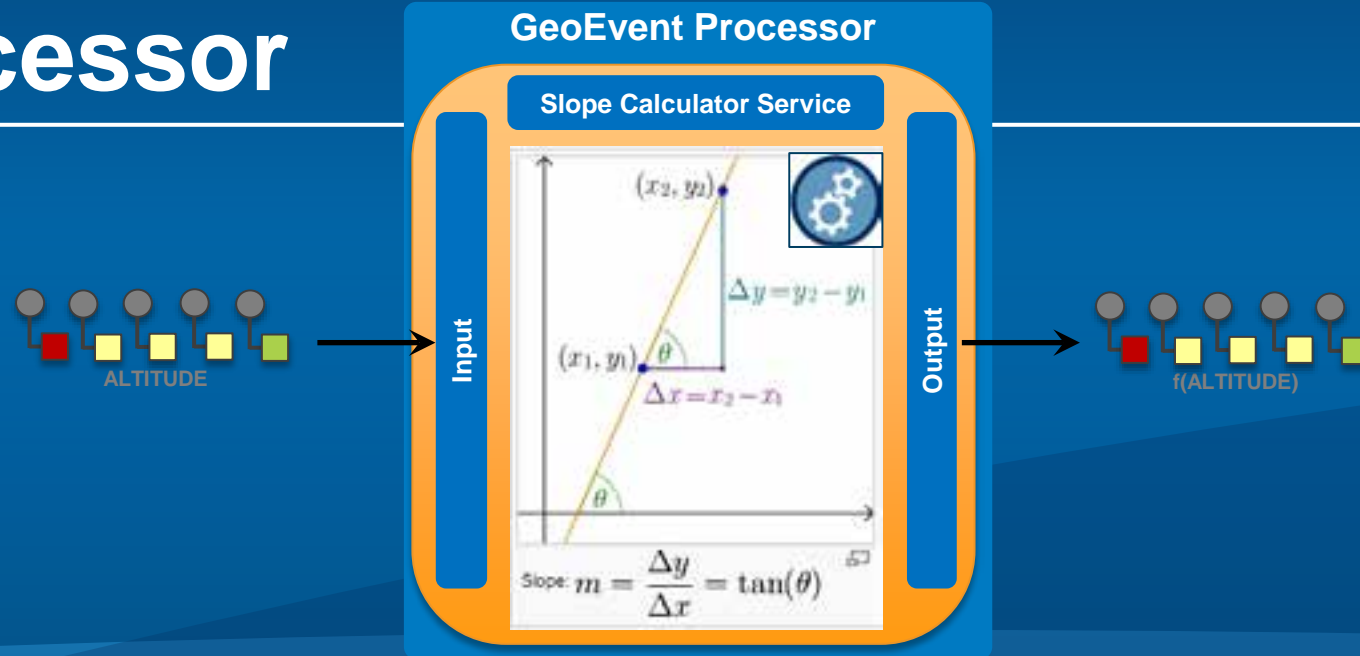
GeoEvent Processors

- You can perform continuous analytics on GeoEvents as they are received using a processor.



Simple Processor

Slope Calculator



GeoEvent Processor

Development Environment

- Java SE 7 Development Kit



- Software project management and comprehension tool



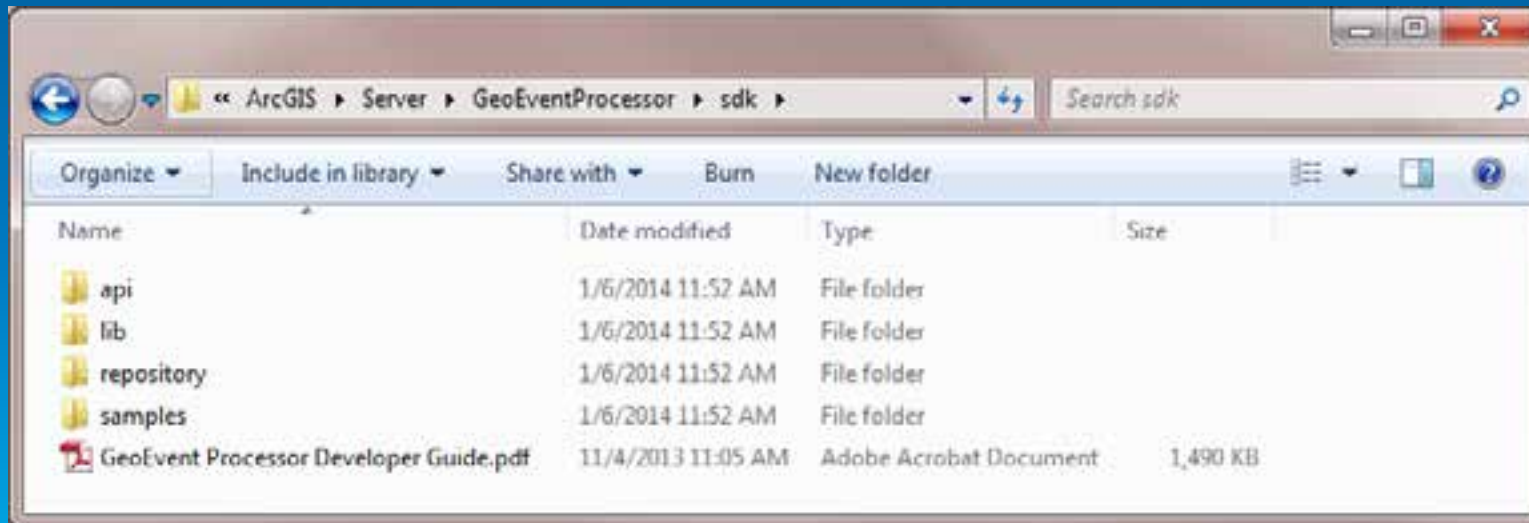
- Java Development Environment

Extending GeoEvent Processor

Software Development Kit (SDK)

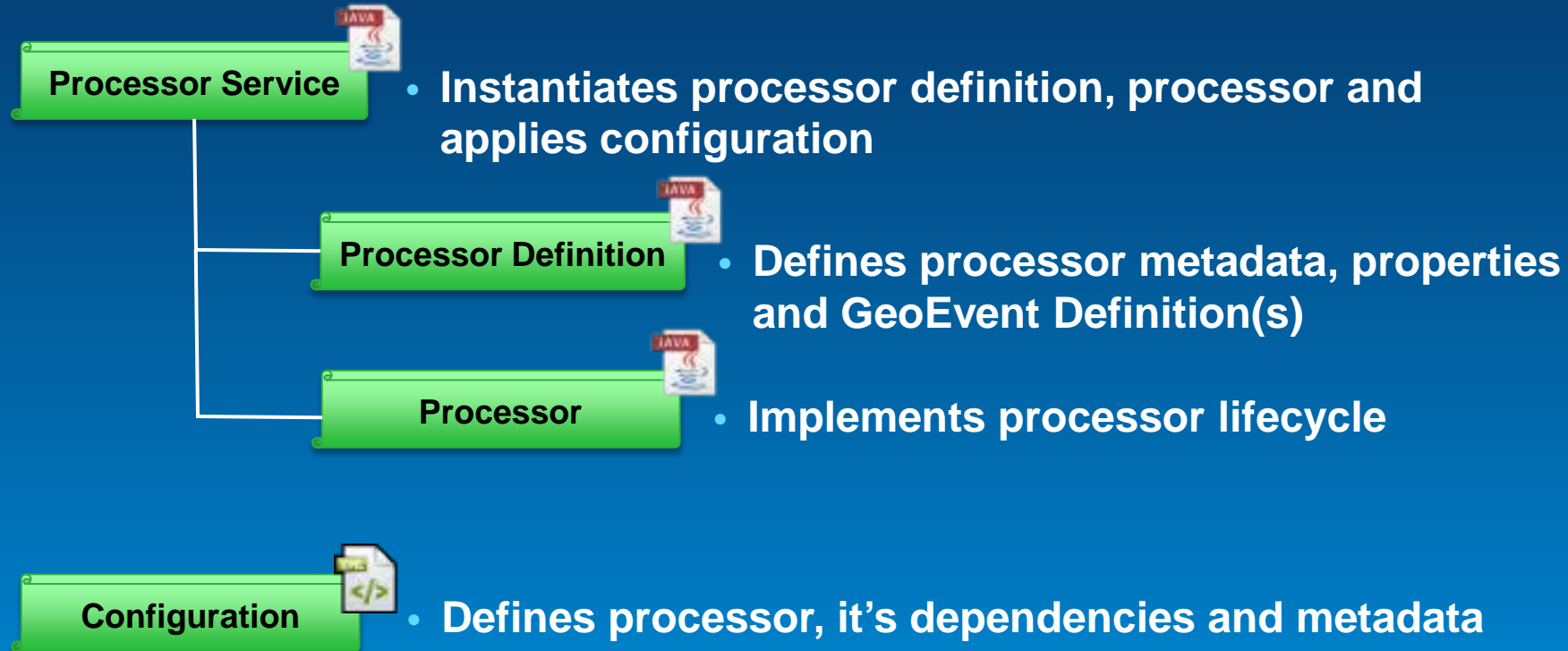


- **api:** JavaDoc content associated with GeoEvent Processor SDK
- **lib:** Library used to build processors (and connectors)
- **repository:** Local maven repository
- **samples:** Sample processors (and connectors)
- **GeoEvent Processor Developer Guide**



Anatomy of a Processor

What makes up a Processor?



Processor Definition

Step 1: Properties and GeoEvent Definition(s)

```
public class SampleProcessorDefinition extends GeoEventProcessorDefinitionBase
{
    private static Log LOG = LogFactory.getLog(SampleProcessorDefinition.class);

    public SampleProcessorDefinition()
    {
        try
        {
            // Define processor properties ...
            propertyDefinitions.put("propertyName", new PropertyDefinition("propertyName",
                PropertyType.String, "", "Label", "Description", false, false));

            // Define processor GeoEventDefinition(s) ...
            GeoEventDefinition ged = new DefaultGeoEventDefinition();
            ged.setName("SampleDefinition");
            List<FieldDefinition> fds = new ArrayList<FieldDefinition>();
            fds.add(new DefaultFieldDefinition("fieldName", FieldType.String, "FIELD_TAG"));
            ged.setFieldDefinitions(fds);
            geoEventDefinitions.put(ged.getName(), ged);
        }
        catch (Exception e)
        {
            LOG.error("Error setting up SampleProcessor Definition.", e);
        }
    }
}
```

Processor Definition

Step 1: Metadata

Identification

1. Name
2. Domain
3. Version

```
@Override
public String getName()
{
    return "SampleProcessor";
}

@Override
public String getDomain()
{
    return "sample.processor";
}

@Override
public String getVersion()
{
    return "10.2.2";
}
```

Description

4. Label
5. Description
6. Contact Information

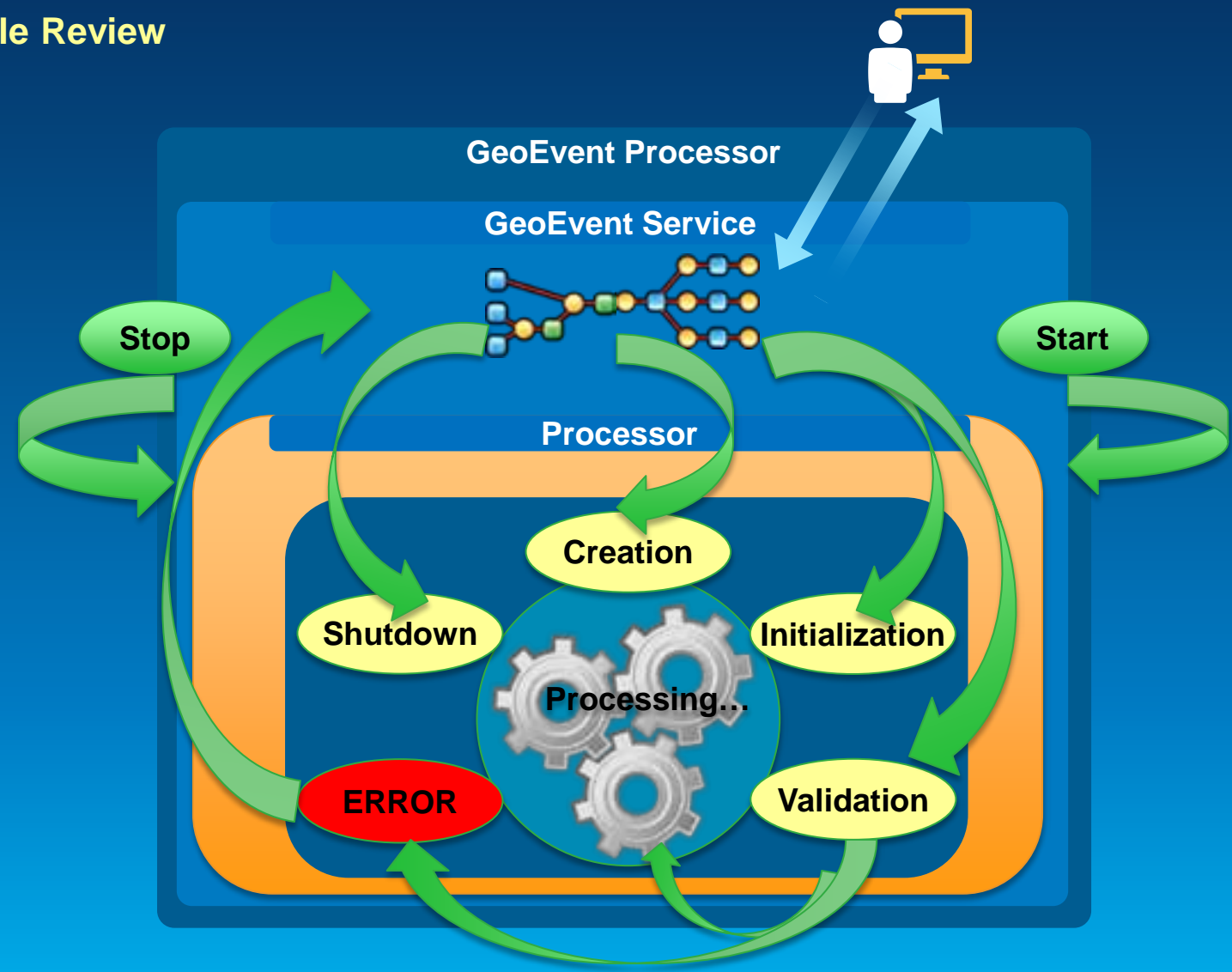
```
@Override
public String getLabel()
{
    return "Sample Processor";
}

@Override
public String getDescription()
{
    return "This is a Sample Processor.";
}

@Override
public String getContactInfo()
{
    return "geoeventprocessor@esri.com";
}
```

Processor

Step 2: Lifecycle Review



Processor

Step 2: Lifecycle

1. Creation
2. Initialization
3. Validation

```
public class SampleProcessor extends GeoEventProcessorBase
{
    private static final Log LOG = LoggerFactory.getLog(SampleProcessor.class);

    public SampleProcessor(GeoEventProcessorDefinition definition) throws ComponentException
    {
        // Creation
        super(definition);
    }

    @Override
    public void afterPropertiesSet()
    {
        // Initialization
    }

    @Override
    public synchronized void validate() throws ValidationException
    {
        // Validation
        super.validate();
    }
}
```

Processor

Step 2: Lifecycle

4. Processing
5. Shutdown
6. Service Start / Stop

```
@Override
public GeoEvent process(GeoEvent geoEvent) throws Exception
{
    // Processing
    return geoEvent;
}

@Override
public void shutdown()
{
    // Shutdown
    super.shutdown();
}

@Override
public void onServiceStart()
{
    // Service Start
}

@Override
public void onServiceStop()
{
    // Service Stop
}
```

Processor Service

Step 3: Definition

- Create new Java class
- Extend `GeoEventProcessorServiceBase` class
- Creates processor definition
- Creates processor instance
- Applies configuration

```
public class SampleProcessorService extends GeoEventProcessorServiceBase
{
    public SampleProcessorService()
    {
        definition = new SampleProcessorDefinition();
    }

    @Override
    public GeoEventProcessor create() throws ComponentException
    {
        return new SampleProcessor(definition);
    }
}
```


Processor Service

Step 4: Configuration

- Declare processor service as a service implementing GeoEventProcessorService interface from GeoEvent Processor SDK

```
<?xml version="1.0" encoding="UTF-8"?>
<blueprint xmlns="http://www.osgi.org/xmlns/blueprint/v1.0.0">
  <bean id="sampleProcessorServiceBean"
        class="sample.processor.SampleProcessorService" activation="eager">
    <property name="bundleContext" ref="blueprintBundleContext" />
  </bean>
  <service id="sampleProcessorService" ref="sampleProcessorServiceBean"
    interface="com.esri.ges.processor.GeoEventProcessorService"/>
</blueprint>
```

Property Definitions & Spatial API

Buffer Calculator



Advanced Features

Geometry Processors

ArcGIS GeoEvent Processor Workshops

Video recordings available on-line

- **ArcGIS GeoEvent Processor – An Introduction**
 - Tue 1:00pm-2:00pm (Primrose B), Wed 10:30am-11:30am (Primrose B)
- **Building Real-Time Web Applications Using GeoEvent Processor**
 - Tue 2:30pm-3:30pm (Pasadena/Ventura/Sierra)
- **Use Cases for Applying Real-Time Analytics using GeoEvent Processor**
 - Tue 4:00pm-5:00pm (Primrose B), Thu 2:30pm-3:30pm (Primrose C/D)
- **Extending ArcGIS GeoEvent Processor with New Connectors**
 - Wed 1:00pm-2:00pm (Pasadena/Ventura/Sierra)
- **GeoEvent Processor: Community Connectors and the Internet of Things**
 - Wed 4:00pm-5:00pm (Primrose C/D)
- **Extending ArcGIS GeoEvent Processor with New Processors**
 - Wed 5:30pm-6:30pm (Primrose C/D)
- **The Road Ahead: ArcGIS for Server and Portal**
 - Thu 10:00am-11:00am (Primrose B)

GeoEvent Processor

Additional Resources

- Read 'GeoEvent Processor Developer Guide' in the SDK
- Forum
<http://links.esri.com/geoevent-forum>
- Resource Center – Includes Tutorials
<http://links.esri.com/geoevent-processor>
- Explore existing GeoEvent Processor GitHub projects
<http://www.github.com>

Galleries:

<http://links.esri.com/geoevent-gallery>

<http://links.esri.com/geoevent-partner-gallery>

<http://links.esri.com/geoevent-community-gallery>

Extending GeoEvent Processor

Summary

- **GeoEvent Processor can be easily extended with new processors:**
 - **Downloading a processor from a Gallery**
 - **Building a processor from a GitHub Repo**
 - **Creating your own processor using the GeoEvent Processor SDK**
 - **You can contribute your processor to a Gallery/GitHub**

Questions / Feedback?

To learn more:

<http://links.esri.com/geoevent-processor>



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<http://www.esri.com/events/devsummit/session-rater>

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Extending ArcGIS GeoEvent Processor with New Processors (3/12/2014 5:30:00 PM)

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Feedback is welcome!