MAXIMO ADMINISTRATOR GUIDE

Abstract

This training manual covers a basic overview of Maximo 7.5 CMMS Administrator basics.

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Maximo Administrator Guide

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1 Workflow

1.1 Workflow Overview

Workflow features let you automate repetitive business processes and record management processes. Automating these processes provides a means for greater efficiency and accountability throughout the UD Maintenance Management Process.

1.1.1 Workflow Purpose

Workflow provides a means of electronically reproducing your business processes so that they can be applied to records. Using Workflow to manage records lets you do the following tasks:

- Consistently apply your business practices to records.
- Manage the movement of a record through a process from start to finish.
- Route a record and appropriate instructions to the appropriate individuals so that they can act on it.
- Ensure that individuals act on records assigned to them in a timely manner.
- Guide users through their interaction with a record.
- Ensure that an audit trail exists for each record and process.

1.1.2 Workflow Capabilities

Workflow is an integrated part of the software and includes the following capabilities:

- Workflow processes and their supporting records are at the system level in a multi-site implementation, and therefore can be used for all organizations and sites. You can design processes or sub-processes that are organization-specific or site-specific through the use of logical branching.
- You can create a Workflow process for any business object (MBO). Because all the applications are associated with MBOs, you can build Workflow processes for any application, including cloned and custom applications.
- A record can be routed into a Workflow process automatically or manually.
- When a process task requires a user decision, the record can be assigned to a role. At run time, the role resolves to a person group, person, or delegate (alternate).
- Assignees can receive notifications of assignments in their Workflow Inbox, or in their e-mail inbox, eliminating the need for users to search for their assignments.
- You can specify a delegate when workers are unavailable.
- Workers or administrators can reassign Workflow tasks.
- Assignees can link from their Workflow Inbox directly to the assigned record.
- When a process requires user input, the system can display a dialog box with a menu of context appropriate options specified in the process.

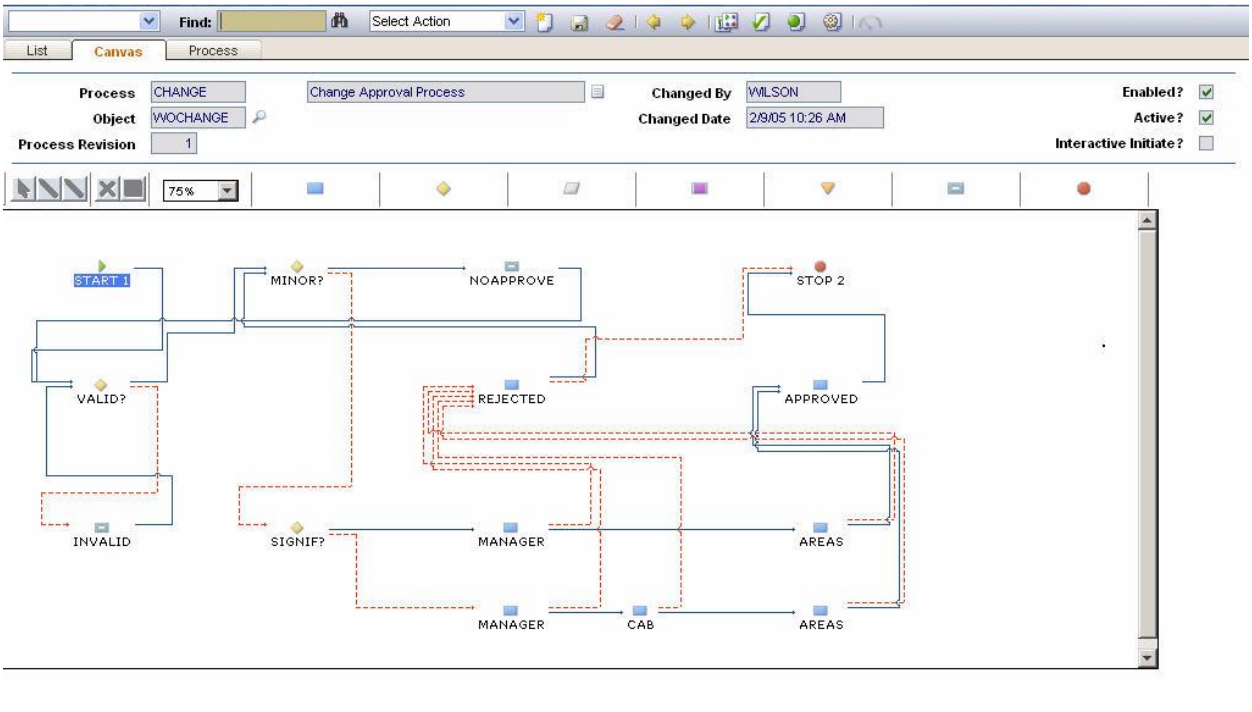
- When a process requires user interaction, the system can direct a user to a specific application, tab, or action.
- If there is only a single choice of actions, the system can move a record through a step in a process.
- You can define a time limit for completing a task, after which the system can escalate the record.
- You can specify at what point in a process you want e-mail notifications generated.
- Workers or administrators can stop a process instance and remove a record from the control of Workflow.
- A Workflow process can run a program (batch file or .exe) stored on a local server in the system directory.
- A Workflow can run a custom JavaTM class.
- A Workflow process for one type of record can launch a process for another type of record. For example, a service request can launch a process for an incident.
- A Workflow process can contain subprocesses, for example, for different subcategories of records, or records from different Sites.

1.1.3 Workflow Symbols

Symbol	Represents
	Start Node
	Condition Node
	Interaction Node
	Manual Input Node
	Subprocess Node
	Task Node
	Wait Node
	Stop Node
	Positive Connection Line
	Negative Connection Line

1.1.4 Understanding the Workflow Canvas

The Workflow Canvas tab provides the tools and workspace to create, view, and modify Workflow processes. The Workflow canvas is a graphical representation of a Workflow process that lets you see the process elements and how they are connected.



The Workflow Canvas tab consists of the following sections:

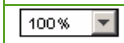
- Record header
- Workflow tool palette
- Workflow canvas

You use the canvas to add nodes and connection lines as you construct a process and to configure the properties of each process elements.

1.1.5 The Workflow Designer Toolbar Buttons

Icon	Function
	Create Process Revision — Click to create a revision of an enabled or activated process.
	Validate Process — Click to validate a process.
	Enable Process — Click to enable a completed process.
	Activate Process — Click to activate an enabled process.

1.1.6 The Workflow Tool Palette

Icon	Function
	**Move/Add Nodes Tool** — Click to manipulate nodes.
	**Connect Nodes Tool** — Click to draw a line between nodes that indicates a positive outcome or a true condition.
	**Negative Connection Tool**— Click to draw a line between nodes that indicates a negative outcome or a false condition.
	**Delete Nodes Tool** — Click to delete the highlighted node or connection line. You can also right-click a canvas element and select Delete.
	**Properties Tool** — Click to specify properties for the highlighted node or connection line. You can also right-click a canvas element and select Properties.
	**Zoom Tool** — Select a magnification level from the Zoom menu to increase or decrease the magnification of the Workflow canvas.
	**Task Node Tool** — Click to drag a new Task node onto the canvas.
	**Condition Node Tool** — Click to drag a new Condition node onto the canvas.
	**Manual Input Node Tool** — Click to drag a new Manual Input node onto the canvas.
	**Subprocess Node Tool** — Click to drag a new Subprocess node onto the canvas.
	**Wait Node Tool** — Click to drag a new Wait node onto the canvas.
	**Interaction Node Tool** — Click to drag a new Interaction node onto the canvas.
	**Stop Node Tool** — Click to drag a new Stop node onto the canvas.

1.1.8 Understanding Workflow Nodes

A **node** is a graphical element representing a point in your business process. The Workflow designer includes different types of nodes that can represent different points in your business process, including:

- A record's entry into the process
- Decision points
- Points when a path branches
- Manual input from an individual or group
- Automated actions
- Record exit from the process

You can drag and drop nodes from the palette onto the canvas. You can add any number of nodes to a process. However, if a process exceeds 50 – 100 nodes, you might want to consider whether you can break the process down into subprocesses to simplify managing and maintaining it.

NOTE The Move/Add Nodes Tool must be selected in order to manipulate nodes on the canvas.

1.1.9 Understanding Start Nodes 

A Start node indicates the point when a record enters or starts a Workflow process. The tool palette does not include a Start Node Tool because when you create a new process, a single Start node is placed on the canvas. Each process can have only one Start node, and you cannot delete Start nodes.

Connecting Lines - A single positive connection line must exit the Start node.

Properties - You cannot define properties for Start nodes.

1.1.10 Understanding Task Nodes 

A Task node indicates when a user has two choices, for example, to approve or reject a record. Use Task nodes when your business process requires a user to evaluate the record and you want to create a task assignment that routes the record to one or more individuals.

When a Task node is encountered while a record is routed through the process, the process stops. The system generates one or more task assignments, based on the node properties. Individuals can receive task assignments via the Workflow Inbox portlet on their Start Center, or via e-mail. The assignee views and completes the assignment in the Complete Workflow Assignment dialog box.

Use the Task Node Tool in the palette to place a new Task node on the canvas. A process can have one or more Task nodes, but you do not have to include Task nodes in a process.

Connecting Lines - You can have one or more positive connection lines entering a Task node. You can have one or more negative connection lines entering a Task node. Only one positive and one negative connection line can exit a Task node. The properties of the connection lines exiting the Task node define the instructions displayed to the user in the Complete Workflow Assignment dialog box.

Properties - You can define the following properties for a Task node:

- **Assignments** – Specify one or more roles to which to assign the record. You create role records in the Roles application. The node properties and the role definition are used to determine which persons the record is assigned to when a record is routed through a process. You can also specify a time limit for completing the assignment.
- **Notifications** – you can use a communication template to create one or more notifications, or enter a subject, message, and role recipients manually.

- **Perform Accept Action** – you can specify whether one or all assignees must approve the record in order for the record to follow the positive connection line as it leaves the Task node.

1.1.11 Understanding Condition Nodes

A Condition node indicates an evaluation of the record, based on data in the record. Use a Condition node to have a true/false evaluation made on the record and then direct the record based on that evaluation. When a Condition node is encountered, the record is evaluated based on the SQL statement defined in the node properties. The record is then routed to either the positive or negative connection line exiting the node.

Use the Condition Node tool in the palette to place a new Condition node on the canvas. A process can have one or more Condition nodes, but you do not have to include Condition nodes in a process.

Connecting Lines - You can have one or more positive connection lines entering a Condition node. You can have one or more negative connection line entering a Condition node. One positive and one negative connection line must exit a Condition node.

Properties - You can define the following properties for a Condition node:

- **Expression** – Specify a SQL statement to use to evaluate the record. This SQL statement indicates which fields to evaluate and the condition against which the field values should be tested.
- **Custom Class** – Specify that a custom class file be used to evaluate the record. Custom class files should be located in the Maximo directory.

1.1.12 Understanding Manual Input Nodes

A Manual Input node indicates a need for user input because there are multiple directions that a record can take in a process. Use a Manual Input node to have a person decide what should happen next. When a Manual Input node is encountered, the user sees a dialog box. The Manual Input dialog box contains a menu of options for routing the record. When the assignee selects an option, such as Create Change, Create Problem, or Return to Start Center, the system triggers any actions or notifications associated with the option.

Use the Manual Input Node Tool in the palette to place a new Manual Input node on the canvas. A process can have one or more Manual Input nodes, but you do not have to include Manual Input nodes in a process.

Connecting Lines - You can have one or more positive connection lines entering a Manual Input node. You can have one or more negative connection lines entering a Manual Input node. You can have multiple positive connection lines exiting a Manual Input node. You cannot have negative connection lines exiting a

Manual Input node. The properties of the connection lines exiting the Manual Input node define the options displayed to the user in the Manual Input dialog box.

Properties - You can define the following properties for a Manual Input node:

- **Display One** – the options that are displayed to the user in the Manual Input dialog box are determined by the security permissions of the user and any conditions specified on the connection lines. Used to specify what to do if the user has security permissions to only one specified option.
  - If the check box is selected, users see the single option in the Manual Input dialog box.
  - If the check box is cleared, the option is automatically selected and the record is routed through the node.
- **Actions** – the Actions table window is read-only and displays the actions associated with connection lines exiting the node.
- **Notifications** – The Notifications table window displays the notifications associated with connection lines exiting the node. You can use a communication template to create one or more notifications, or enter a subject, message, and role recipients manually.

1.1.13 Understanding Subprocess Nodes

A Subprocess node indicates that a separate Workflow process is contained within a Workflow process. Use a Subprocess node to break a complicated business process down into smaller self-contained units. For example, you might use a different process for different subcategories of records, such as records from different Sites, or different classes of work orders. When a Subprocess node is encountered while routing a record through a process, the record is routed into the subprocess. When the record encounters a Stop node within the subprocess, it returns to the main process at the same point where it had left the process.

Use the Subprocess Node tool to place a new Subprocess node on the canvas. A process can have one or more Subprocess nodes, but you do not have to include Subprocesses nodes in a process. A Workflow can have one or more Subprocess nodes based on the complexity of your business process and how you choose to design the process.

Connecting Lines -You can have one or more positive connection lines entering a Subprocess node. You can have one or more negative connection lines entering a Subprocess node. A record might be traveling a positive or a negative connection line when it exits a subprocess. Therefore you must have a single positive and a single negative connection line exiting a Subprocess node.

Properties - You can define the following property for a Subprocess node:

- **Subprocess** – you can specify the name of an existing enabled Workflow process to use as a subprocess.

1.1.14 Understanding Wait Nodes

A Wait node indicates that the progress of a record through a process should pause until a required condition is met. Use a Wait node to create a reaction to a database event, for example, a status change, or a record being updated. You might use a Wait node when your implementation is integrated with another system. For example, you might have an external financial system with which you must exchange data.

When a record encounters a Wait node, it pauses at the node indefinitely, until any event specified in the node properties occurs. After the specified event occurs, the record resumes its progress through the process. Any actions or notifications specified on the properties of the connection line exiting the node are triggered.

Use the Wait Node tool in the palette to place a Wait node on the canvas. A process can have one or more Wait nodes, but you do not have to include Wait nodes in a process. A Wait node cannot precede a node that requires user interaction (Interaction node or Manual Input node).

Connecting Lines - You can have one or more positive connection lines entering a Wait node. You can have one or more negative connection lines entering a Wait node. You are required to have a single positive connection line exiting the Wait node.

Properties - You can define the following properties for a Wait node:

- **Wait List** – you can specify two events, record updates and status changes, on a Wait node. The first event that occurs, triggers the record to resume its progress through the process.
  - **Event Names** consist of three or 4 words delimitated by periods, all in lower-case. For example: **"maximo.workorder.add"**. The first word is always "maximo." The second word is the name of the mbo. The third word is one of the following: init, add, update, delete, or statuschange. Only statuschange events have a fourth word currently, which is the internal name of the status to which the record is changed. Business objects with different names for status levels, will have different event names. Business objects which do not implement the Stateful Mbo interface will never create an event with name using statuschange. The following event names are additional examples:
    - maximo.pr.delete
    - maximo.po.add
    - maximo.change.update
    - maximo.workorder.statuschange.appr
    - maximo.sr.statuschange.resolved
    - maximo.asset.init

- **Notifications** — you can use a communication template to create one or more notifications, or enter a subject, message, and role recipients manually.

1.1.15 Understanding Interaction Nodes

An Interaction node provides one option for a user interaction with a record. Use Interaction Nodes with Manual Input nodes to guide a user through a structured interaction with a record.

When an Interaction node is encountered while routing a record through a process, the result depends on how the node is configured. You can configure an Interaction node in the following ways:

- Specify that the record be displayed in the specified application.
- Specify that a certain application tab display.
- Specify that an action is triggered from the application's toolbar or Select Action menu.
- Specify that a process is triggered. For example, trigger another Workflow process.

In addition, a message dialog box can display, containing instructions to the user.

Use the Interaction Node tool in the palette to place a new Interaction node on the canvas. A process can have one or more Interaction nodes, but you do not have to include Interaction nodes in a process. A Manual Input node usually precedes an Interaction node. If an Interaction node leads to an application not related to the object specified on the process record, a Stop node should follow the Interaction node.

Connecting Lines - You can have one or more positive connection lines entering an Interaction node. You can have one or more negative connection lines entering an Interaction node. You can have only one positive connection line exiting an Interaction node.

Properties - You can define the following properties for an Interaction node:

- **Application and Tab** — you can direct the user to a specific application and tab.
- **Action** — you can direct the user towards a specific application action.
- **Relation** — you can create an interaction that leads to another application. The information in the **Relation** field is used to determine which record to display in the specified application.
    - If the interaction involves creating a new ticket or work order, you use the Relation field to specify what kind of new record has been created, for example, NEWWORKORDER.
    - If the interaction does not involve creating a new record, you can use the Select Relationship dialog box to specify a data

relationship, for example, the asset record that is listed on a work order.

- **Process** – you can direct the launch of an active Workflow process for the specified application. For example, if you create an incident record from a service request you could launch a Workflow process for the incident record.
- **Directions** – you can specify instructions to display to users when they select the interaction.

1.1.16 Understanding Stop Nodes

A Stop node marks the end of a Workflow process, that is, the point where a record leaves control of the process. When you create a new process, a single Stop node is placed on the canvas. Use the Stop Node tool in the palette to place additional Stop nodes on the canvas.

You use a Stop node to have a record exit the process. If you are creating a subprocess, you use a Stop node when you want the record to return to the main process. When a Stop node is encountered while routing a record through the process, the record exits the process.

Each process must have at least one Stop node. A process can have multiple Stop nodes.

Connecting Lines - You can have any combination of positive and negative connection lines entering a Stop node. Because a Stop node is the end of the process, connection lines cannot exit a Stop node.

Properties - You cannot define properties for Stop nodes.

1.1.17 Understanding Connection Lines

All nodes in a process must be connected to at least one other node, and all nodes except Start and Stop nodes must be connected to two other nodes. You can draw two types of connections between nodes:

- **Positive Connections** – you use the Connect Nodes Tool to draw a positive line between nodes. A solid black line on the canvas represents a positive connection. A positive connection indicates a positive outcome, for example, that an action was performed, a record was approved, or that a record meets the condition specified by the node.
- **Negative Connections** – you use the Negative Connection Tool to draw a negative line between nodes. A dashed red line on the canvas represents a negative connection. A negative connection indicates a negative outcome, for example, that a record was cancelled, a record was rejected, or a record does not meet the condition specified by the node.

1.1.18 Understanding Actions

An action is an event that is triggered by the progress of a record through a Workflow process. For example, changing the status of a record. You define actions in the Actions application.

You can configure the following Workflow components to trigger actions:

- Negative connection lines
- Positive connection lines

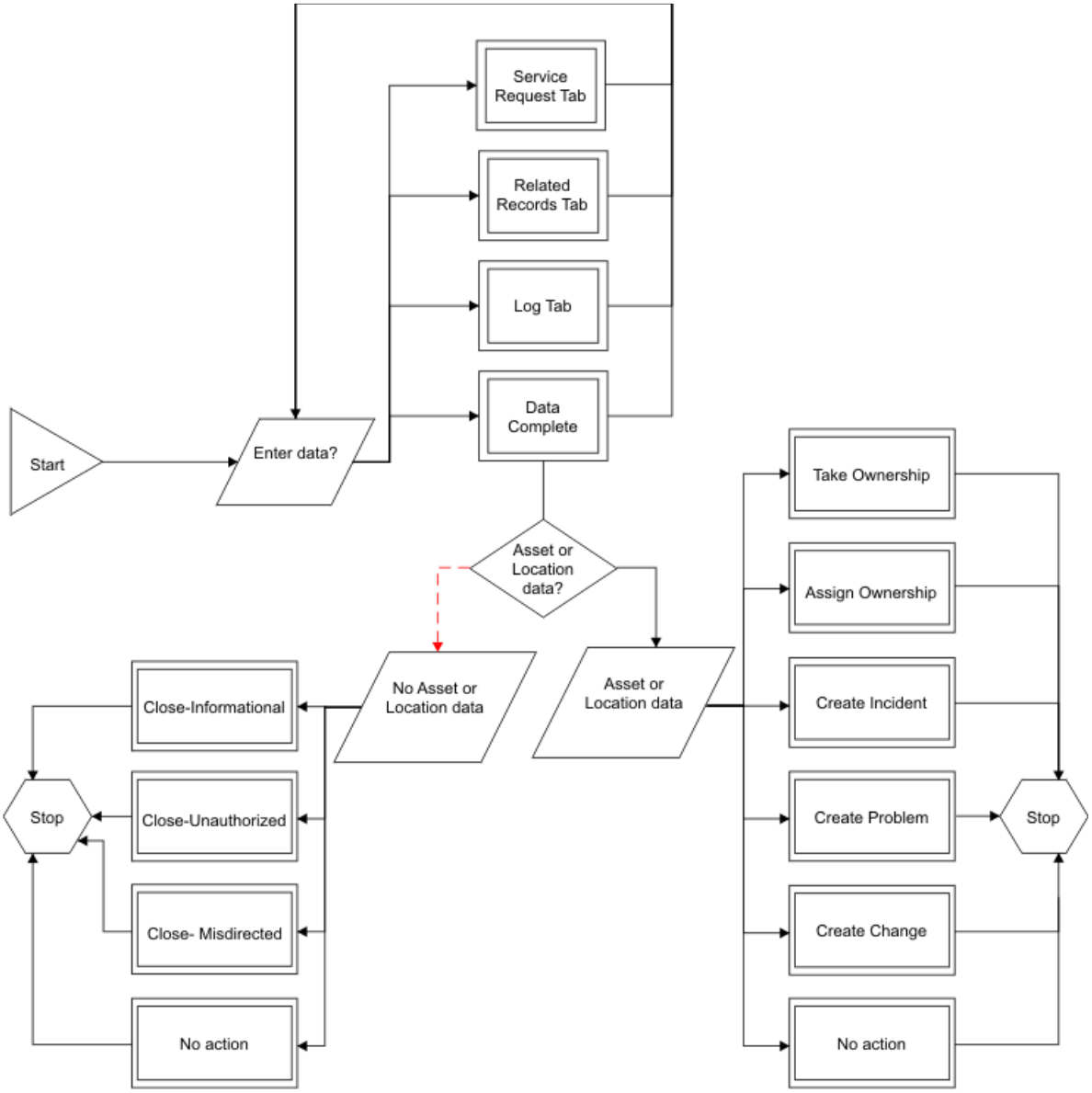
1.1.19 Understanding Notifications

A notification is an e-mail message that is generated by a record's progress through a Workflow process. You can use a communication template to create a notification, or enter a subject, message, and recipients manually.

You can configure the following Workflow components to generate notifications:

- Negative connection lines
- Positive connection lines
- Manual Input nodes
- Task nodes
- Wait nodes

1.1.20 Sample Workflow Process – Service Request Process Diagram



1.1.21 Sample Service Request Business Process

This example uses the Service Desk functions, and is designed to guide the Service Desk agent through the initial steps of the record management process.

When Service Desk agents take an incoming telephone call, they create a service request ticket to record the interaction. The application requires the agent to record the caller's name and telephone number.

The agent must also enter a short description of the service request, for example, a request for information, IT service, or maintenance. The agent must also enter a classification for the service request. Depending on the type of service request, the agent might also enter information about the asset or location.

When the agent saves the service request ticket, the system launches the SR Workflow process. The system displays a Manual Input dialog box with the following options:

- I must enter additional information regarding this service request.
- I must enter information about tickets or work orders related to this service request.
- I must make an entry in the Work Log or Communications Log.
- I have completed data entry for this ticket.

If agents indicate that they must enter additional information, the system displays either the Service Request tab, the Related Records tab, or the Log tab, depending on which option the agent selected. When agents indicate that they have completed data entry for a service request, the system evaluates the data on the record.

If the agent has not entered asset or location data, the system displays a Manual Input dialog box with the following options:

- Close ticket - informational call.
- Close ticket - unauthorized caller
- Close ticket - misdirected call.
- Take no action.

If an asset or location is specified on the record, the system displays a Manual Input dialog box with the following options:

- Take Ownership of ticket. (Take Ownership action)
- Assign Ownership of ticket. (Assign Ownership action)
- Create Incident record. (Create Incident action)
- Create Problem record. (Create Problem action)
- Create Change work order for an IT asset. (Create Change action)
- Create Work Order for a non-IT asset. (Create Work Order action)
- Take no action on this ticket.
- After the agent selects an option from a manual input dialog box, the record exits the Workflow process.

2 CRON Tasks

You can use the Cron Task Setup application to add cron tasks, cron task instances, remove cron tasks or their instances, and to modify cron task parameters. You can also change the Active status or adjust the schedule of a cron task. Cron tasks can be rescheduled and parameter values can be changed without stopping and restarting the server. The server performs cron tasks a specific number of times, following a schedule, and without user interaction.

Creating cron tasks requires programming resources to create custom class files.

2.1 Cron Tasks Included with the System

Name	Description
ReorderCronTask	Reorder cron task Determines the rules or parameters for scheduled reordering, direct issue, and inventory items
PMWoGenCronTask	Preventive maintenance work order generation Runs and generates scheduled work orders for planned maintenance
KPICronTask	Generates key performance indicators
LDAPSYNC	LDAP sync Synchronizes information stored in external directory servers for user authentication
ESCALATION	Escalations Escalation processes ensure that people complete critical tasks on time
LSNRCRON	E-mail Listeners Runs continuously on the system application server and processes inbound e-mail through a staging table
JMSQSEQCONSUMER	Used by the IBM® Maximo® Enterprise Adapter for polling the queue
IFACETABLECONSUMER	Used by the Enterprise Adapter for polling interface tables
SwSuiteCronTask	SwSuite Inspects the software titles collected in Deployed Asset, and determines whether the set of titles defined in the Deployed Asset Software Suite application are present If so, the Suite displays when inspecting that node for software discovered
ReconciliationCronTask	Reconciliation Runs reconciliation Tasks (consisting of Link and Comparison rules) to determine how assets are performing relative to the discovered data in

	Deployed Asset Outputs from this task: ➢ RECONLINK table that links assets to their counterpart assets ➢ Reconciliation Results table that lists the differences between compared and Deployed Assets
MeasurePointWoGenCronTask	Generates work orders when meter readings or measurements reach a condition defined in the Condition Monitoring application.
FLATFILECONS	Flat file inbound processing through cron task
XMFILECON	XML file inbound processing through cron task
VMMSYNC	Invokes IBM WebSphere® Virtual Member Manager through cron task Invokes WebSphere Virtual Member Manager APIs to populate database tables with user group and group membership records
BBCron	Periodically updates the count for the number of bulletin board postings

TIP: All cron tasks are set to FULL access level, except ESCALATIONS and LSNRCRON (READONLY).

3 Escalations

An escalation is a mechanism to monitor records which can take actions or send notifications when a record reaches a defined escalation point. You use the Escalations application to create, view, modify, and delete escalation records.

You can create an escalation for any business object. Because all applications are associated with business objects, you can create escalations for any application.

3.1 Example Ticket Escalation

The following example illustrates escalations that can be built with the Escalations application.

By default, the network support group owns all tickets related to network issues. If tickets are not resolved within three hours, the service provider:

Escalates priority to high

Passes ticket ownership to a supervisor

Sends an e-mail notification to people within the Organization regarding a danger of service level agreement non-compliance

3.2 Escalation Components

An escalation record consists of the following elements:

- Object — (Applies To field) you create escalation records for a specific business object. The escalation engine retrieves records from the business object that meet the escalation point criteria.
- SQL Statement — (Condition field) an escalation record can apply to all application records, or to a specific set of records. You can create an SQL statement that specifies records to which the escalation is applied. The conditions can apply to one or more tables associated with the object.
- Organization and/or Site — Escalations are at the System level. You can create escalations for use with a specific Organization or Site.
- Schedule — a schedule that defines how often the system checks for records that meet the criteria for the escalation. The polling interval can be seconds, minutes, hours, days, weeks, or months. You also can specify that the interval be calendar or date based.
- Escalation Point — Date- and time-based, or other condition criteria for when the actions or notifications specified on the escalation record are triggered. An escalation record can have one or more escalation points.
- Actions — any actions that must be taken when a record reaches the conditions of an escalation point. You define actions separately for each escalation point. You can associate multiple actions for each escalation point.
- You use the Actions application to define actions.

- Notifications — any notifications that the system must generate when a record reaches the conditions of an escalation point. You define notifications separately for each escalation point.

3.3 Understanding Escalations

The application server contains an escalation engine in the form of CRON task that:

- Drives the escalation process
- Leverages the CRON task function
- Tests all active escalation definitions at a set schedule

To trigger escalations, the engine:

- Retrieves escalation definitions from the database and constructs appropriate SQL statements
- Runs SQL statements against target objects for the escalation
- Retrieves records and performs actions and notifications associated with escalation definitions

3.4 Modifying Escalations

All fields on an activated escalation are read-only. To modify an escalation record, you first must deactivate it (see Escalations online help).

You can modify the following elements of a deactivated escalation:

- You can delete one or more escalation points.

  To activate an escalation, it must have at least one escalation point. When you delete an escalation point, the links to the associated actions and notifications are also deleted.

- You can delete one or more actions or notifications associated with an escalation point.

To activate an escalation, it must have at least one action or notification defined for each escalation point.

4 Domains

4.1 About Domains

Some system fields are associated with value lists from which users select appropriate values. These lists of defined values are called domains. The system uses many domains in its applications.

You use the Domains application to add or modify domains to fit your business practices. The system uses the following domains:

- SYNONYM - These are special, reserved domains in the system. You cannot add new SYNONYM domains or delete existing ones. You can add new synonym values.

  For example, if your company procedures require two people to approve a work order, you can add synonym values for the internal WAPPR value. You can then present two different values to the user; for example, WAPPRMAN and WAPPRVP, to represent approvals at the manager and vice president level.

- ALN - A simple list of values that use one of the alphanumeric data types.

  For example, your company requires that calendar information is consistent, and you create a list of the days of the week or months of the year. Unlike a SYNONYM domain, the values in this list are for informational purposes only, the values are not editable.

- NUMERIC - A simple list of values using one of the numeric data types.

  For example, a list containing the numbers 10, 25, 50, 75, and 100.

- NUMERIC RANGE - A list of numeric values that you define when you specify a range.

  For example, you want to track the temperature range for a piece of equipment with range values of <50, 50-59, 60-69, 70-79, 80-89, 90-99, and >100.

- TABLE - A dynamic set of values based on the values of another object.

  For example, you can use a table domain to present a valid list of records from the PERSON table to be typed in the OWNER field on a record.

- CROSSOVER - A special type of table domain in which the system brings back another value (or values) from the specified record.

  For example, you want the system to retrieve the serial number of an asset in the Assets application and insert it into a field in the Items application.

4.2 Tasks after Adding Domains

After adding domains, additional tasks might be required, depending on the domain and how you want the system to display it. You can use the Classifications application, Database Configuration application, or Application Designer application to complete these tasks.

4.2.1 Classifications and Domains

- You assign a domain to an attribute or use the Database Configuration application to assign the domain.

  You associate a domain with an attribute in the Attributes table window; no further configuration is needed.

4.2.2 Database Configuration and Domains

- You associate a domain with an attribute. Most domains also have a default value specified. If the attribute is required, a default value for the domain is also required.

  For example, an amount field might be bound to a NUMERIC domain or a status field might be bound to a SYNONYM domain.

  When you configure the database, the system does not validate the value you insert as the default field value. For example, you can have an Organization called EAGLENA, where the only acceptable domain value is CREW4.

  You can make the crewid attribute required in the Preventive Maintenance application, give it the default value of CREW2, and configure the database without error. The error, such as CREW2 is not a valid value, appears only when you return to the Preventive Maintenance application to insert a record.

4.2.3 Application Designer and Domains

- You modify the user interface as needed.

  For example, if you added an alphanumeric domain for a field, you add the select value button using the Application Designer application. New crossover domains might require new fields in the destination application.

5 Calendars

You can use the Calendars application to create and modify calendars associated with these system records:

- Assets
- Labor
- Locations
- Organizations
- People
- Preventive maintenance records
- Service Level Agreements
- Tools
- Work orders

Calendar records incorporate start and end dates, shift definitions, and non-working time. Holidays are examples of non-working time. Any number of person, asset, or other records can reference a single calendar.

A calendar record is defined by a start date and end date, and by the shift definitions and non-working time you apply to it. Non-working time includes holidays and any other type of non-working time you want to define. Applying shifts and non-working time to a calendar generates the work periods for the calendar.

Typically you create calendars for Organizations, but you can also make them Site-specific. You might need multiple calendar definitions. For example:

- Corporate Calendar – includes standard shifts and holidays
- Asset Calendar – working time calendar for asset UPTIME

5.1 Exceptions to the Standard Calendar

Information for individuals, such as vacation days, sick leave, personal time, and overtime, is not stored on the main calendar record. Use the following applications and icons to enter exceptions to the standard calendar:

Application	Icon
People	Modify Person Availability
Assignment Manager	Modify Availability

The system combines the standard calendar assignments and the exceptions to determine a person's availability for a given day, shift, and so on.

5.2 Shift Patterns

A shift defines working time without being date-specific. You select the working days for the week, then designate the start time and end time for work. For example, create a shift called First, with these properties:

- Working days are Monday through Friday
- Work starts at 7:00 a.m.
- Work ends at 3:00 p.m.
- Work hours for the day total 8

You can create special shift definitions that are atypical for your work Site (for example, a Saturday night or Holiday shift).

Once you define a shift, you can apply it to a calendar. After you create a calendar, you can use it on person, location, asset, and other records to specify working time.

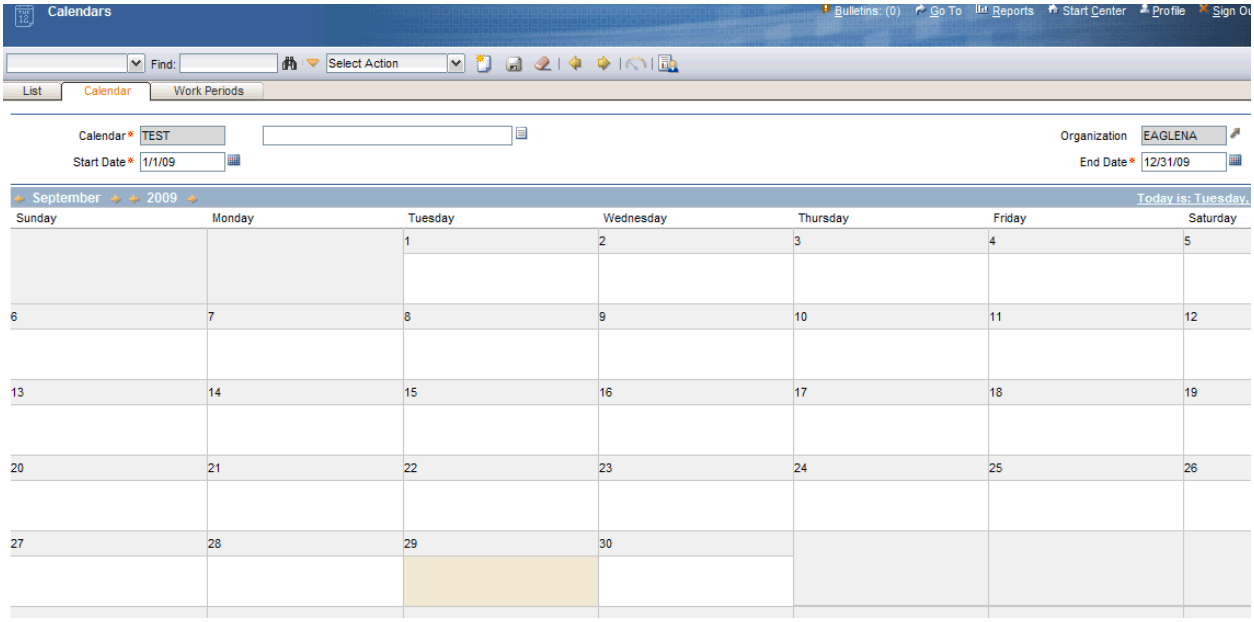
Sample Shift Pattern	Start Day
Seven Days	Sunday
Multiple of seven days (i.e. 14, 21…)	Monday
Five Days	Rotates

If the number is not a multiple of 7, the pattern does not repeat on the same days of the week.

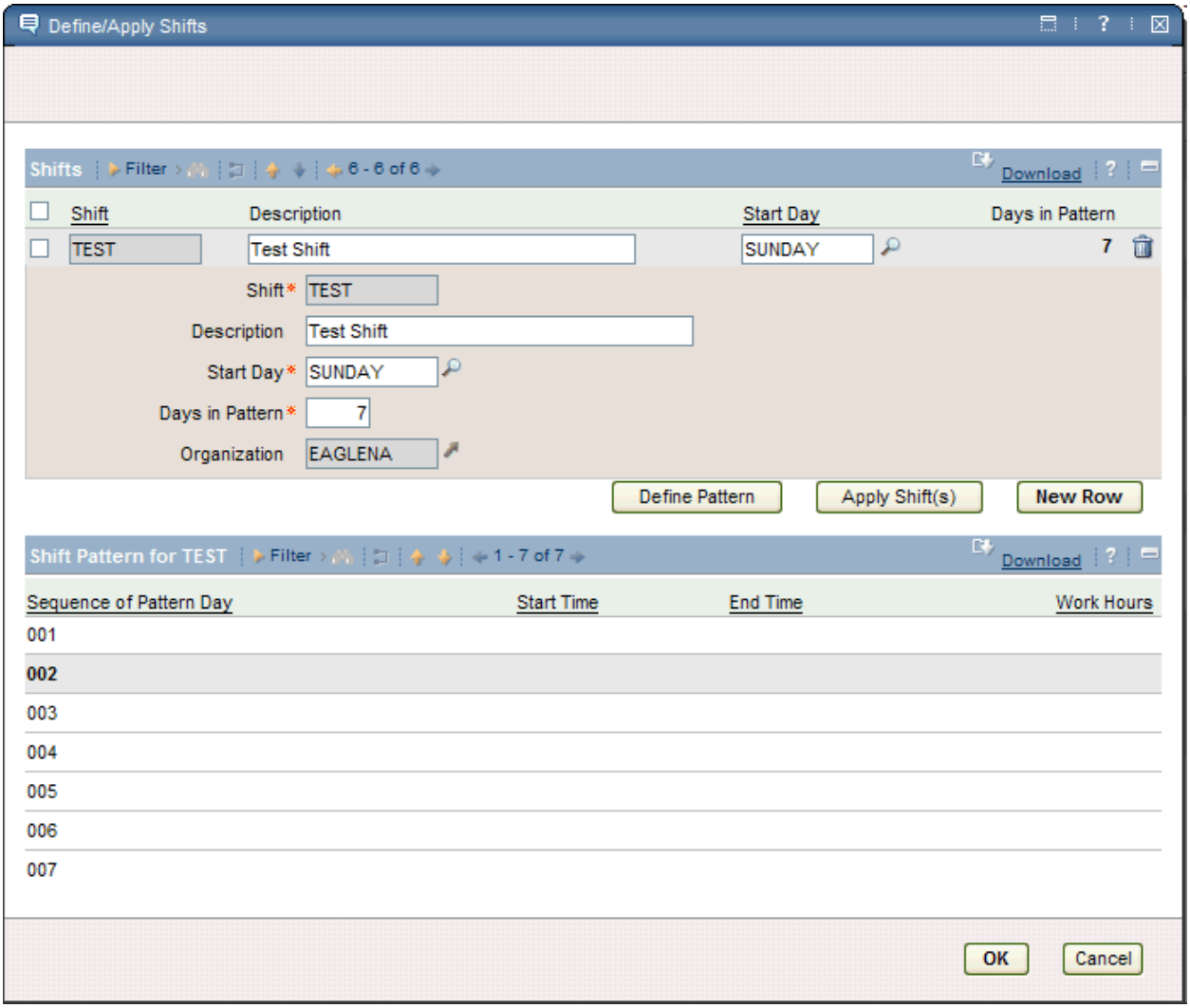
5.3 Creating a Calendar in Maximo

The following steps explain how to create a Calendar in Maximo:

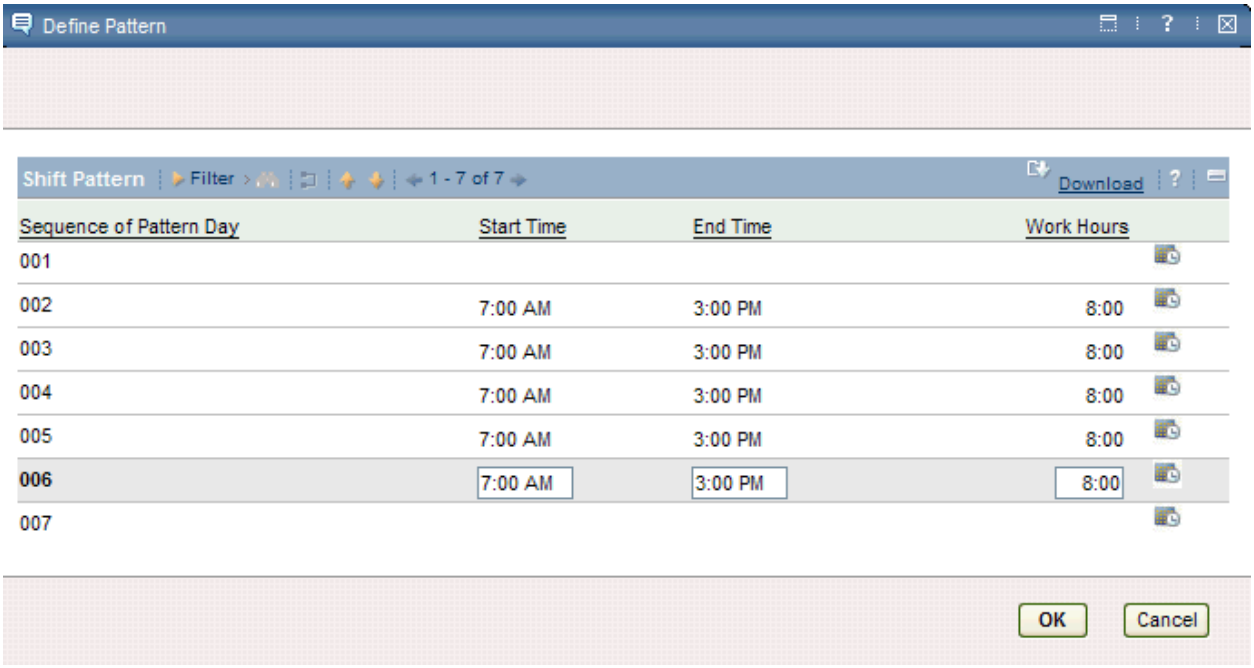
1. Go To → Administration →Calendars
2. Create the Calendar by going to "Insert" menu.
3. Add the Organization Identifier.
4. On the Calendar Field type "TEST"
5. On the Start Date; Click on the Detail Button and select January 1, 2009 and on the End Date; Click on the Detail Button and select December 31, 2009 and press Enter



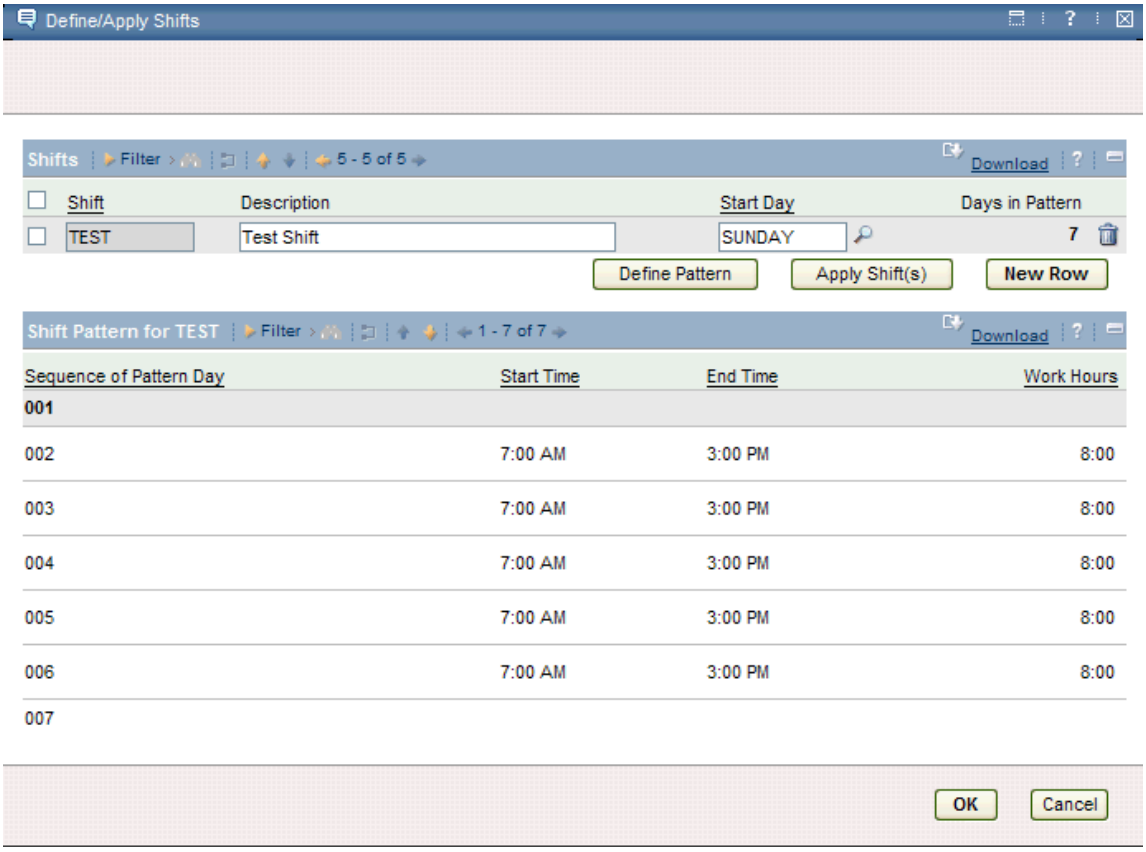
6. Go to Actions Define Apply/Shifts.
7. Click the Insert Row button
8. Here you need to fill out the Shift—Description—the Start Day and Days in Pattern, as an example; we could use TEST as the Shift – Test Shift as the Description—SUNDAY as the Start Day and 7 as the Days in Pattern



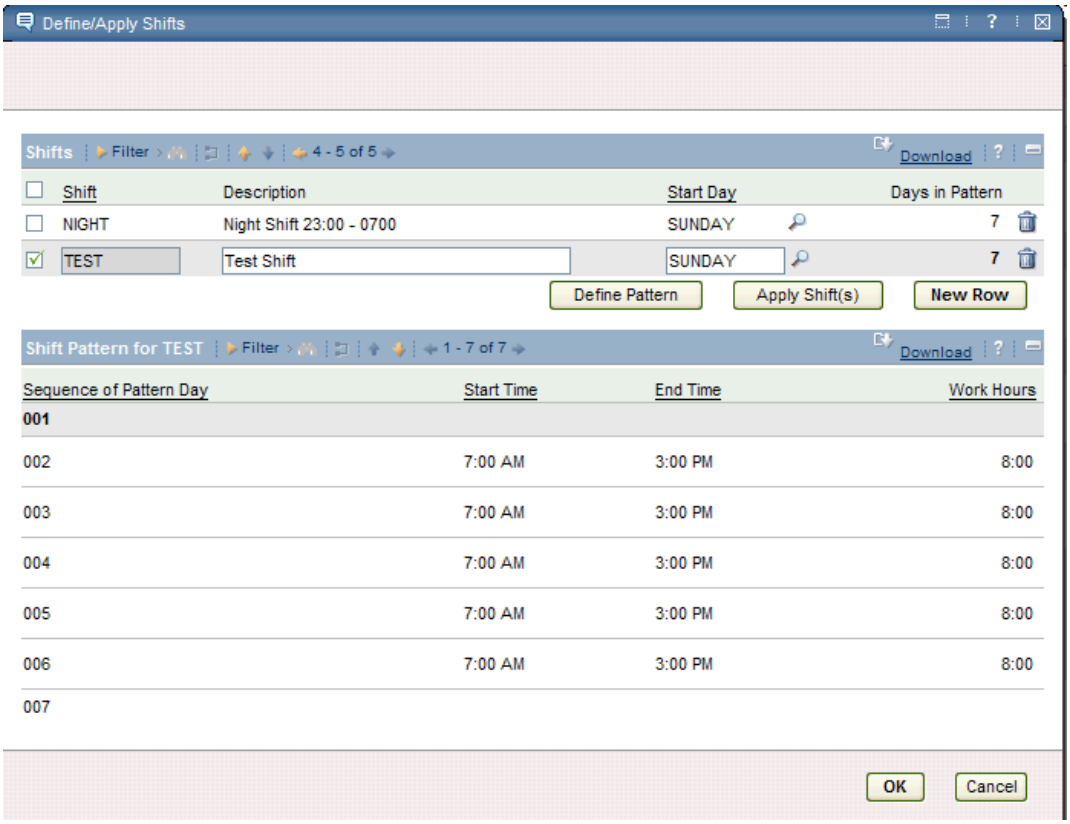
9. Click OK and now you need to highlight the row that we just added and click on Define Pattern button;
10. A new dialog box will show, as shown below.
11. Here you need to fill the Start Time—End Time—and this will calculate the Work Hours as shown on the picture below. Click OK this will bring you back the previous dialog box shown above.



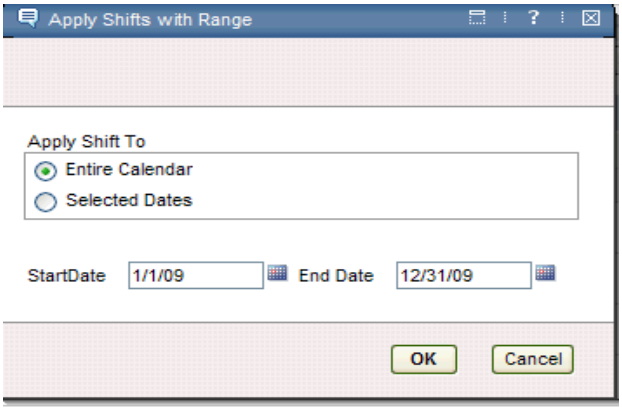
12. Click Close to exit the dialog box.



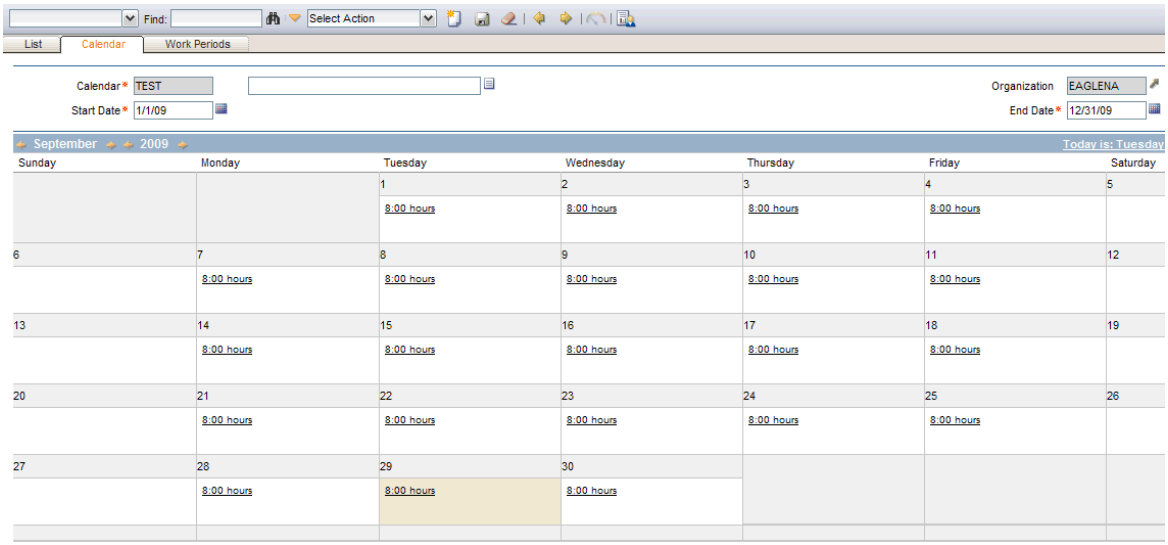
13. Now click on the Actions menu and select Define Apply/Shifts…
14. Highlight the Shift that you just created in this practice, and click Apply Shifts.



15. This will bring the following dialog box. Select the desired option as shown below and click OK.



16. This will take you back to the previous dialog box “Define/Apply Shifts”, click OK and the Calendar should look like this:


Find:
Select Action
List
Calendar
Work Periods
Calendar * TEST
Start Date * 1/1/09
Organization EAGLENA
End Date * 12/31/09
September 2009
Today is: Tuesday
Sunday Monday Tuesday Wednesday Thursday Friday Saturday
1 2 3 4 5
8:00 hours
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

6 Meters

6.1 Meters application

You use the Meters application to add or to modify meter definitions. Meter definitions include names for the meters as well as sets of attributes that describe the meters. Meters are used to track asset or location performance. An asset or a location can have multiple meters associated with it.

While there may be instances where the same meter is used more than once on the same asset or location, meters in the following applications reflect logical meters:

- Meter Groups
- Assets
- Locations
- Preventive Maintenance
- Job Plans
- Items
- Condition Monitoring

Meters in these applications are used to track meter readings, not physical meters.

6.2 Working with meters

Maximo meters are not actually physical meters. Meters are simply a placeholder where reading are entered to track history of performance.

There are three types of meters in Maximo:

- Continuous
- Gauge
- Characteristic

Continuous meters are counters. We all have a continuous meter in our cars, in the form of an odometer. Continuous meters increase in value, and just like an odometer; they often have a rollover point. Continuous meters are typically used to drive preventive maintenance tasks based on manufacturer recommendations, such as changing your oil every 7500 miles (1200 km).

Gauge meters fluctuate, like the thermostat in your home. Classic gauge meters include temperature, pressure, and vibration. Each of these are conditions, thus the term condition monitoring. Monitoring the conditions of our assets will allow us to see if the performance of the asset is degrading and could possibly fail. Thus, we are trying to predict when the asset will fail prior to actually failing.

Characteristic meters are user defined. You create a domain (list of values) and link it to a meter. When you enter a reading, instead of entering a number, you select one of the predefined

values from your list. This is quite powerful because you can create a list of standard observations, and use characteristic meters to support inspections.

6.3 Creating meters

You use the Meters application of the Assets module to add or to modify meter definitions, including the names for the meters and the sets of attributes that describe the meters.

6.3.1 Procedure

1. On the toolbar for the Meters application, click New Meter.
2. In the Meter field, type a meter name.
3. In the Meter Description field, type a description.
4. In the Meter Type field, specify the type of meter, as follows:
    a. If the meter type is characteristic, specify a domain in the Domain field. Only the value associated with this domain is available when this meter is attached to an asset, to a preventive maintenance location, or to a condition monitoring point.
    b. If the meter type is continuous, specify a reading type in the Reading Type field.
5. Complete the other fields as needed, and click Save Meter.

6.4 Creating meter groups

You use the Meter Groups application to define a logical grouping of meters. Meter groups represent a collection of meters that are used together multiple times. For example, you can add multiple meters to an asset, to a location, or to a rotating asset at the same time.

Before you begin:

Meters must be defined in the Meters application before they can be added to a meter group or used in other applications.

About this task:

You cannot add multiple meters with the same name to a group. To track readings for multiple meters of the same type for an asset, create unique meter names for each meter.

Procedure

1. On the toolbar, click New Meter Group.
2. In the Meter Group field, specify a unique name for the meter group, and type a description.
3. Select the Apply New Meters Where Group Is Used check box if you want to add the meter to existing assets. If you select this option, the value defaults to the detail

section of the record. You can edit this value. If you leave this box unchecked, the meter is added to assets that use this meter group in the future.

4. Click New Row to add meters to the group.
   5. Specify the name of the meter you want to add.
   6. Complete the remaining required fields.
   7. Click Save Meter Group

6.5 Specifying meter readings on work orders

You can enter meter readings for the asset and the location on a work order. An asset can be set up to inherit the meter readings of its parent asset or its location.

Procedure:

8. Display the record for which you want to enter a reading.
9. From the Select Action menu, select Enter Meter Readings.
10. To enter a meter reading, select either of the following options:
11. To enter a meter reading for the asset, click the Asset Meter Readings tab.
12. To enter a meter reading for the location, click the Location Meter Readings tab. If the asset and location have meters, and the asset inherits the meter reading for the location, enter a reading for either the asset or the location. If the asset has child records that inherit meter readings, the meter readings for the child records are updated. If the location has assets that inherit meter readings for the location, the readings for the assets in that location are updated.
13. In the New Reading field, enter a value, or click Select Value. The system date and time display in the New Reading Date field. The log in name for the user displays in the Inspector field.
14. To change the inspector, specify a value, or click Detail Menu to retrieve a value.
15. To enter the reading and return to the record, click OK.

7 Condition Monitoring

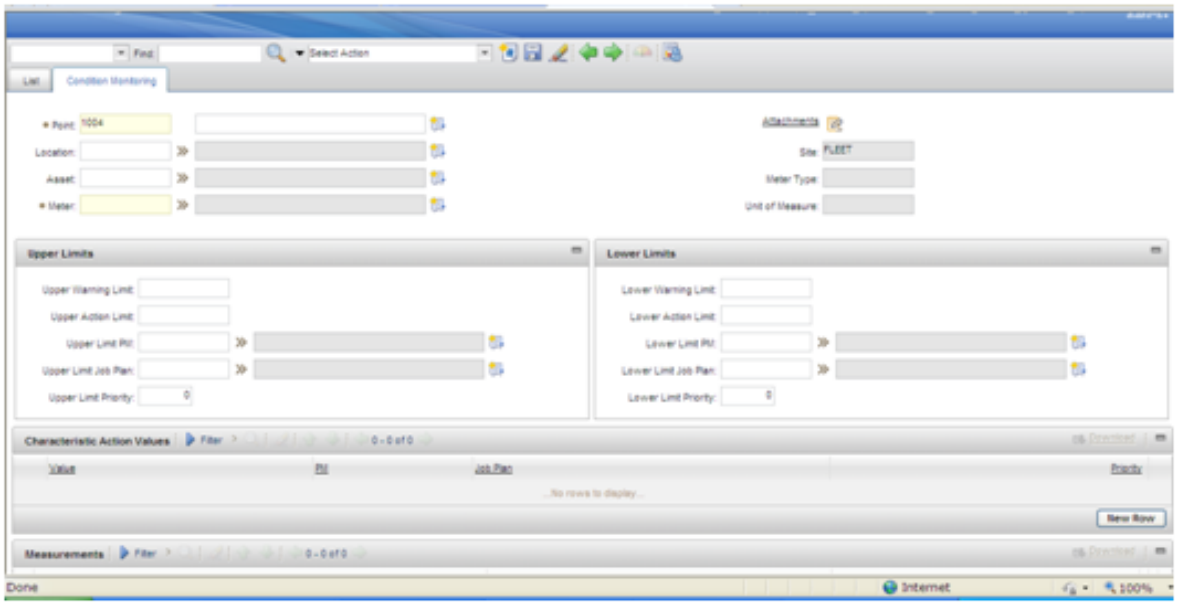
You use the Condition Monitoring application to create and to view measurement point records for assets and for locations. A measurement point record defines the limits of acceptable meter readings for a characteristic meter or for a gauge meter on an asset or at a location.

In this application, you can generate preventive maintenance work orders. You can also generate work orders with a specific job plan for assets or for locations with meter readings that are outside the defined limits.

7.1 Working with Condition Monitoring

Measurement point records define acceptable condition and performance measurements for a meter on an asset or a location where this type of data is collected. When condition monitoring detects measurements outside of the acceptable range, then you can generate work orders to correct the problem.

7.1.1 Creating Measurement Point Records



1. From the Condition Monitoring tab of the Condition Monitoring application, click New Measure Point, and type a value in the Point field, if needed.
2. In the Meter field, specify the meter name or click Detail Menu to select a meter for this measurement point.
3. In the Asset or the Location field, type the identifier. If you choose an asset that is associated with a location, the location identifier displays in the Location field.

4. If the meter is of a continuous type, specify the upper and lower warning limits and action limits. In the Upper Warning Limit field and in the Lower Warning Limit field, type the values for the meter readings that define the upper warning limit and the lower warning limit.
5. In the Upper Action Limit field and in the Lower Action Limit field, specify the values for the meter readings that define the upper action limit and the lower action limit. If these limits are reached, these values cause a preventive maintenance or a job plan to be generated when you select the Generate Work Orders action. Measurements at or beyond the warning limits indicate that you must monitor this point carefully. Measurements at or beyond the action limits alert you that the asset or the location may require maintenance or repair.
6. In the Upper Limit PM field or in the Upper Limit Job Plan field, type the identifier of the preventive maintenance record or the job plan record to use on all work orders that you generate for a higher than acceptable reading on this measurement point. The preventive maintenance record or the job plan record must already be associated with the asset or the location, and cannot be a master preventive maintenance record.
7. In the Lower Limit PM field or in the Lower Limit Job Plan field, type the identifier of the preventive maintenance record or the job plan record to use on all work orders that you generate for a lower than acceptable reading on this measurement point. The preventive maintenance record or the job plan record must already be associated with the asset or the location, and cannot be a master preventive maintenance record.
8. In the Upper Limit Priority field, type a value to use when scheduling the upper limit work order.
9. In the Lower Limit Priority field, type a value to use when scheduling the lower limit work order.
10. If the meter type is characteristic, complete the characteristic action values. These are observational readings that result in the initiation of a preventive maintenance or a job plan. Under the Characteristic Action Value table, click New Row.
11. In the Value field, specify a value, or click Detail Menu to select a value for this characteristic action value. You can enter one action value for each type of observation for a given characteristic meter. For example, if a meter has possible values of high, medium, and low, specify one preventive maintenance or one job plan to use if the value is high; one to use if the value is medium; and a third one to use if the value is low.
12. Click Save Measure Point.

7.1.2 Generating work orders to address specific problems

When the meter reading of an asset or a location is outside of specified limits, you can generate work orders to address the problem.
Procedure

13. From the List tab of the Condition Monitoring application, select the records for which you want to generate work orders.
14. Select the Generate Work Orders action.
15. In the Effective Date field, specify the effective date. You can modify this field until you generate the work orders.
16. Optional: In the Memo field, type a short description of the work orders. This field is used only in the Condition Monitoring application. The description is not copied to the Description field of a work order.
17. Optional: If you want to use the action limits of the measurement point as the criteria for generating work orders for an asset, select the Use Action Limits as Work Order Generation Criteria box. When you use the action limits as criteria, you can generate work orders only when meter readings are outside the upper limits or outside the lower action limits.
18. Click OK.

8 Safety Plans

You use the applications in the Safety module (within the Planning module) to inform workers of potential dangers in their work environment and to provide information to protect workers from those dangers. The hazards, precautions, and procedures that you define in these applications can apply to assets, work locations, or both. You associate the records that you create in these applications with Asset, Location, PM (Preventive Maintenance), and Work Order records.

8.1 Safety Plans application

Safety plans provide all the safety related information about an asset or location in one record, which you can then copy to job plans and work orders. You must clearly associate safety requirements and procedures with work orders to fulfill the requirements of regulatory agencies. You use the Safety Plans application to create safety plans and to add and view associated work assets, hazards, precautions, and tag out procedures.

When you use a safety plan on a work order, the information about hazards, precautions, and hazardous material is copied to the work order, even if no work assets are associated with the work order.

8.1.1 Creating safety plans

Create safety plans to inform employees of hazards that they might encounter while performing work and the actions they must take to prevent accidents. You can create generic safety plans for use on all work assets or locations or for use on a particular work asset or location.

Procedure

1. In the Safety Plans application, click New Safety Plan.
2. In the Safety Plan field, specify an identifier for the safety plan.
3. Optional: Specify the work assets and locations that might use this safety plan on a work order or a job plan.
    a. Click New Row.
    b. In the Location field or the Asset field, specify a value. You can specify a location or an asset, but not both.
4. Perform one or both of the following actions to associate hazardous material, precaution, and tag out information with the safety plan.

Option	Description
View and Select related assets and hazards	Select the **Select Hazards** action
Manually add related assets and hazards	Use the tabs to add precautions, hazardous materials and tag out procedures

5. Click Save Safety Plan.

8.1.2 What to do next

- In the Job Plans application, you can associate the safety plan with a job plan.
- In the Preventive Maintenance (PM) application, you can associate the safety plan with a PM record through a related job plan.
- In the Work Order Tracking application, you can associate the safety plan with a work order.

8.2 Hazards Application

A hazard is any condition that exists in the workplace that might lead to worker injury, property damage, or financial loss. You use the Hazards application to define hazards, associate preventive measures (precautions) and hazardous materials with hazards, and view tag out procedures that are associated with hazards.

8.2.1 Creating Hazard Records

Create a hazard record to ensure that employees working with work assets (assets and locations) are informed of potential dangers associated with those assets.

Procedure:

6. In the Hazards application, click New Hazard.
7. In the Hazard field, specify an identifier for the hazard.
8. Optional: In the Type field, specify the type of hazard.
9. Specify the type of information that you will associate with the hazard. If you associate a tag out procedure with the hazard, you cannot also associate a precaution or a hazardous material with the hazard.

Associated Information	Action
Precautions	Sect the **Can Have Precautions** check box
Hazardous Materials	Select the **Can Have Hazardous Materials** check box
Tag out procedures	Select the **Can Have Tag Outs** check box

10. If you selected the Can Have Hazardous Materials check box, complete the fields in the Hazardous Material Information section.
11. Click Save Hazard.

8.2.2 What to do next

- In the Precautions application, you can create a precaution to associate with the hazard.
- In the Assets application or the Locations application, you can associate the hazard with an asset or a location.

8.3 Precautions Application

A precaution is a preventive measure that you take to reduce or eliminate a workplace hazard; for example, wearing hearing protection when working in an area where you are exposed to loud noises. You use the Precautions application to define safety precautions.

8.3.1 Creating precaution records

Create precaution records to help employees reduce the hazards involved with workplace tasks.

Procedure:

1. In the Precautions application, click New Precaution.
2. In the Precaution field, specify an identifier for the precaution.
3. Click Save Precaution.

8.3.2 What to do next

- In the Hazards application, associate the precaution with a hazard.

8.4 Lock Out / Tag Out application

Tag out procedures are intended to completely eliminate the risks associated with a hazard, and lock out operations must be performed exactly as specified. You use the Lock Out / Tag Out application to create tag out procedures.

8.4.1 Creating tag out procedures

Create a tag out procedure to eliminate a hazard and ensure a safe work environment. To create a tag out procedure, you describe the steps, or lock out operations, to remove a work asset from service and place it in a safe condition. Lock out operations can apply to an asset, a location, a locking device, or an activity that is not related to a particular device or asset.

Procedure:

1. In the Lock Out / Tag Out application click New Tag Out.
2. In the Tag Out field, specify an identifier for the tag out procedure.
3. In the Location field or the Asset field, specify the location or asset to which the tag out procedure applies.
4. In the Site field, specify the site to which the tag out procedure applies.
5. In the Required State field, specify the state that the location or asset must be in after the tag out procedure is applied.
6. Optional: To attach additional information to the tag out record, click Attachments.
7. Specify the lock out operations in the tag out procedure:
    a. Click New Row.
    b. If the lock out operation applies to a particular asset or a location, specify a value in the Location field or the Asset field.

c. If the lock out operation does not apply to a particular asset or location, describe the lock out activity in the Description field.
d. Optional: In the Locking Device Required State field, specify the state that the asset or location must be in after the lock out step is performed.
e. In the Apply Sequence field, specify the sequence number of this step when you tag out the asset.
f. In the Remove Sequence field, specify the sequence number of this step when you restore the asset to service.

8. Click Save Tag Out.

8.4.2 What to do next

You can perform any of the following actions:

- In the Assets application or the Locations application, associate the tag out procedure with a hazard and an asset or location.
- In the Safety Plans application, associate the tag out procedure with a safety plan.
- In the Work Order Tracking application, add the tag out procedure to a work order.